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Teaching and learning in age-homogeneous groups versus mixed-age groups in the preschool – the Swedish example

Lena O Magnusson1* and Kerstin Bäckman1

Abstract: The study presented in this article investigates how the curriculum is implemented and transformed by teachers in mixed-age and age-homogeneous groups, the most common age-constellations in the Swedish preschool. The data was collected through groups interviews with preschool teachers. The interviews were transcribed and analysed with the support of thematic analysis and connected to a sociocultural perspective on learning. The findings show that the teachers in the different age formations use both the same and different teaching strategies, which means that the curriculum is implemented and transformed in different ways. The teaching and learning events in the age-homogenous groups appear to be more structured and planned, whereas in the mixed-aged groups the teaching is more spontaneous and embedded in the everyday activities.

Subjects: Teaching & Learning - Education; Teaching & Learning; Early Childhood

Keywords: Age-homogeneous group; mixed-age group; teaching strategies; preschool education

1. Introduction

The research presented in this article investigates how teachers implement and transform the curriculum in mixed-age and age-homogeneous groups, which are the most common age-constellations in the Swedish preschool. The study was conducted after the implementation of a new preschool curriculum (The Swedish National Agency for Education, 2018), in which the concept of teaching is more clearly emphasised. This change (1) implies that the educated preschool teacher leads all the different professionals working as educators in the preschool (Cervantes & Öqvist, 2021) and (2) reflects an ongoing shift to connect the preschool more closely to Sweden's nine-year compulsory school system (Jönsson et al., 2012).

In Sweden, children can start to attend preschool at the age of one year and continue until the autumn of the year in which they turn six. Attendance at preschool is not compulsory. However, it is estimated that 85% of children aged between 1 and 5 attend preschool (The Swedish National Agency for Education, 2019). Between these ages, the preschool education either takes place in age-homogeneous groups or in mixed-age groups. In this study, the children in the mixed-age groups are between 1 and 5 years, whereas in the age-homogeneous groups they are divided into the age ranges of 1–2, 2–3 and 3–4 years, with the five-year-olds in a separate group of their own.

The preschool curriculum (The Swedish National Agency for Education, 2018) is structured with guidelines and goals to strive for. The goals include democracy, the equal value of all people and those that are more subject-specific. Furthermore, the curriculum states that preschool education should be based on the children's interests and initiatives, which further indicates that children can...
contribute to their own learning. In Sweden, principals and teachers choose how they want to organise the children in terms of age in their preschools and the curriculum does not state how work towards the striving goals is to be implemented.

The style of education that is provided in the mixed-age groups can be said to reflect that of the modern Swedish preschool that emerged in the 1970s (Edenhammar, 1982; Tallberg Broman, 2002). However, in recent decades there has been a significant shift in the preschool towards age-homogeneous groupings, which can be interpreted as a way of dealing with the difficulties of having too many children with a large age spread in one group and enabling educational activities to be carried out in a pedagogical way (Ekström, 2007).

The study investigates how the curriculum is implemented and transformed in the mixed-age and age-homogenous groupings in a Swedish preschool context. The research questions are: How do preschool teachers express that the preschool curriculum is implemented in age-homogeneous vs. mixed-age groups? What are the teaching strategies in the different age formations?

2. Mapping earlier research
Very little research has so far been conducted on group constellations in general, and age-homogeneous groups in particular, from a national or international perspective. The existing research mainly concerns learning, care and children’s development in mixed-age groups.

2.1. Learning in mixed-age vis-à-vis age-homogeneous groups
As already indicated, in Sweden mixed-age groups have existed in the preschool for a relatively long time. This tradition is based on the combination of learning, care and development in early childhood education that is referred to as Educare (Jönsson et al., 2012). Rouse (2014) highlights a different experience in Australia, where education and care have been partially separated by applying clear age divisions. She further argues that planning for learning—and especially social learning—with older children in mixed-age groups can be problematic. However, research on group constellations often focuses on how children learn in different groups. The studies that are available show minor effects on what children learn in mixed-age group constellations (Ansari, et.al. 2015; Lindström & Lindahl, 2011; Purtell & Ansari, 2018). According to Ansari, Purtell and Gershoff (2015), the studies that have examined the effects on children’s learning in mixed-age groups have been of varying quality.

In a study conducted by Lindström and Lindahl (2011) in the primary school, the purpose was to calculate children’s development in mixed-age classes more systematically by focusing on pupils’ cognitive skills and the effects on their learning in both the short- and long-term. The results showed negative effects of participating in mixed-age classes between the ages of 4–6. A negative effect was also evident in children aged 9, albeit to a lesser extent.

Ansari, Purtell and Gershoff (2015, Purtell & Ansari, 2018) studied whether children’s learning improved in age-homogeneous vs. mixed-age groups by looking at the relationship between peer influence, age composition, the children’s skills in language and mathematics, behavioural problems and social ability. The results showed that in mixed-age classes, 4-year-olds developed fewer school-related skills during the preschool year than when they were grouped more homogeneously with children aged between 3 and 4 years. The size of the effect corresponded to 5 months of school-related skills for the 4-year-olds.

Bleses et al. (2017) focused their research on whether mixed-age groups supported children’s language development. They compared the variations in the children’s vocabulary development between the ages of two years and nine months and six years and eleven months. 3,340 children participated in the study, which showed that mixed-age groups could be positively linked to the development of individual children. The results especially applied to vocabulary and showed that a mixed-age group gave the best results, but only when the ages did not differ by less than
14 months or exceed by more than 26 months. This result was seen in all the age compositions and showed that both older and younger children benefitted from participating in a group with an age range that extended between 14 and 26 months. The researchers found no evidence that older children were negatively affected, but that the age mix could give them a mentoring role that allowed them to engage in younger children’s knowledge-building activities. The youngest children interacted with the older children, thereby creating a sense of togetherness in which the younger children could observe the older children’s more complex play and conversation. Thus, the conclusion was that age mixing as a concept could be advantageous as long as the age difference was not too great.

Logue (2006) conducted a small-scale study to discern whether a change from age-homogeneous to mixed-age groups would reduce the competition amongst preschool children. The starting point in this project was that children competed because they were the same age and that the youngest children sometimes hurt each other, for example, by biting. Although this has nothing to do with learning and the educator’s perspective on group constellations, it is interesting to note here because teaching and learning opportunities can be affected if the educator always has to monitor the children to prevent them from harming each other. However, this is partly contradicted by Rouse (2014), who suggests that even though teachers see many benefits in teaching mixed-age groups, there is still a preference for separating very young children due to concerns about their safety.

Smit and Engeli (2015) mean that teachers in mixed-age groups need to think more broadly and decide how children should participate in the teaching, either in less age-homogeneous or more extensive age-heterogeneous groups, with peers or alone. In mixed-age groups, embedded teaching is understood as a common method (Dahlgren, 2017), where the teacher of such a group is less of a teacher and more someone who supports and guides the children’s own efforts to learn. In such cases the teaching is more individually oriented. Edwards et al. (2009) show that in preschool settings the educator often relates age division to children’s development. At the same time, some researchers believe that in mixed-age groups learning and development can be understood as concepts and practices, where age is not crucial for children’s learning opportunities. These insights can be seen to connect to Hedges and Cullen’s (2012) study that learning and teaching in the early years builds on children’s everyday informal knowledge, participation and teachers’ responsive pedagogical approaches. Hedges and Cullen (2012) thus argue that a combination of participatory learning and pedagogy based on children’s everyday knowledge beyond a focus on age division is beneficial.

The idea of participatory learning combined with the everyday development of knowledge can also be linked to the benefits of mixed-age groups in terms of social and empathic skills, where children are motivated by learning from older children (Katz et al., 1990). In such groups the children are challenged by the more knowledgeable children (e.g., Vygotskij, 1978).

3. Theoretical framework
As a representative of what we today term the sociocultural perspective, Vygotskij (1978, 1981) argued that learning depends on the context and children’s earlier experiences. Children learn in a zone of proximal development. In this zone, problem-solving occurs under “adult guidance or in collaboration with more capable peers” (Vygotskij, 1978, p. 86). This way, learning takes place in relation to the knowledge and skills that the children have already acquired and challenges them by offering knowledge that is more complex, more demanding or richer in content.

Children’s early informal interactions provide them with a bank of experience and knowledge that can be developed later in a more formal way. If teaching and learning are to be meaningful, teachers need to see children’s experiences as resources and build on them, because learning is based on what the individual has previously experienced (Selander, 2017). The starting point should be what the children are interested in and from there a transition made to what the
teacher wants to encourage interest in. Here, children’s agency can be of particular interest (Magnusson & Bäckman, 2021). In a sociocultural view of teaching and learning, individuals, the group, the artefacts and the environment are part of a continuous interaction and communication (Selander, 2017). Knowledge, and thus competence, is assumed to be situated, which means that it is inseparable from the context and activities in which it is developed. In a situated learning process, Bruner’s (1996) term scaffolding can be seen as central, in that it indicates that the teacher temporarily supports the child’s learning until it is no longer needed. However, children can also scaffold each other, which means that peers become knowledgeable others in the ongoing interactions and where, according to Vygotskij (1978), children learn in an internalising process from a social level (interpsychological) to an individual level (intrapsychological).

4. Methodology and analytical approach

The study was conducted as an interview study, where the participants took part in group interviews. In the interviews, the researchers used a form with formulated focus areas and starting points in the study’s research questions. Group interviews are useful because they support discussion and the development of ideas among the participants, facilitate an exchange of experiences and generate a wide range of replies and responses (Cohen et al., 2018). A further argument for the use of group interviews is that it is not the preschool teachers’ personal opinions or perceptions that are in focus, but rather their organisational, educational planning and practical ideas.

The data consisted of interviews with 19 early childhood educated teachers from four different preschools—two working with age-homogeneous groups and two with mixed-age groups—in a middle-sized Swedish region. The group interview constellations are shown in Table 1, below. The participants had worked as preschool teachers for between 6–40 years, the exception being a participant who had only worked in this capacity for one year. Many of the participants who had been in the profession for a long time (10–20 years) had experience of working with age-homogeneous and mixed-age groups. All interviews were recorded and later transcribed word for word. All the teachers agreed to participate in the study with a written consent, which followed the ethical framework for research in Sweden (Swedish research council, 2017).

4.1. Thematic analysis approach

The analytical work was conducted using a step-by-step thematic analysis inspired by the work of Braun and Clarke (2006). One of the benefits of using thematic analysis is that if there is limited research in the field, the analytical approach allows for an open-ended search without the need for predetermined goals. In contrast, in areas in which a lot of research has already been conducted, pre-defined codes or themes can be chosen as starting points (Braun & Clarke, 2006).

The thematic analysis focuses on the study’s first question: How do preschool teachers express that the preschool curriculum is implemented in age-homogeneous groups vs. mixed age groups?

<table>
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<tr>
<th>Table 1. Data collection</th>
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<tr>
<td><strong>Age-groups, Preschool</strong></td>
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<td>Preschool 1: Mixed-age group</td>
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<tr>
<td>Preschool 2: Mixed-age group</td>
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<tr>
<td>Preschool 3: Age-homogeneous</td>
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<td>Preschool 4, group 1: Age-homogeneous</td>
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<td>Preschool 4, group 2: Age-homogeneous</td>
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The answer to the second question—What are the teaching strategies in the different age formations?—was identified in the participants’ responses in the interviews. Recording and then transcribing the interviews allowed the researchers to re-read the interview transcripts many times. Such a procedure is also related to the choice of analytical approach. For example, in the inductive search for themes and dilemmas in the thematic analysis, all the original data needs to be available for repeated visits.

Braun and Clarke’s step-by-step thematic analysis first of all involves becoming familiar with the data, then coding it, and from the codes searching for repeated patterns of meaning and potential themes (Braun & Clarke, 2006, p. 35). The first step of coding involved a close reading of the transcribed interviews and here, some key codes were identified. In the next step, the various codes were organised into larger groups, which then formed themes. At the end of the analytical work four central themes had been identified: 1) the content and conditions of the teaching, 2) the children’s interests as part of the teachers’ teaching design, 3) the teacher assignment and 4) material and practical conditions and limitations.

5. Result of the thematic analysis
The four presented themes provide answers to the two questions asked in the study, thus making visible how the teachers express that the curriculum is implemented and what strategies they use in this work. The age constellations are displayed separately to highlight diversity. The four themes are presented using quotations from the interviews.

5.1. Theme I: the content and conditions of the teaching
This theme addresses the importance of content and how the teaching is designed. In the chosen preschools, work teams were responsible for the organisation of the teaching in the various age groups. The planning and implementation of the teaching were affected by the content that was taught, i.e. what the teaching was about and the conditions for it.

5.1.1. Age-homogeneous groups
The teachers described that the curriculum goals and the local prioritised goals were included in both the spontaneous and planned teaching situations and argued that the goals controlled the choice of content in their teaching. They described that they broke down the goals to suit the age group they were working with. The following statement shows the importance of knowing what the curriculum goals are and how the work teams can achieve them: “[...] if you work with embedded teaching, being familiar with it [the curriculum] and knowing what it contains is vital, then you always need to discuss together what it means for you”.

Spontaneous teaching is embedded in the various activities of everyday life and cannot by definition be planned, “it just comes”. The goal with planned teaching is that it should be perceived as spontaneous and embedded. Several of the participants highlighted that one advantage of working with age-homogeneous groups was that one person could be responsible for a subject area in several groups of the same age. The participants said that they chose content and a goal from the curriculum that they worked specifically towards in the unit. They all had the same goal but how they worked with it differed with the age group and the staff in the unit. According to one of the participants, the planning: “[...] has to do with which teachers are working [...] I am a person who likes structure [...] I like to have a typical structure for the week, for my group of children”.

5.1.2. Mixed-age groups
The teachers of the mixed-age groups worked in teams and emphasised that spontaneous teaching occurred all the time in the daily activities and was related to the curriculum goals and the local goals. Planned teaching was also carried out and the children were regarded as resources to help each other to learn. The teachers argued that a starting point when planning their teaching was that the children showed interest in a subject and that their perspectives were taken into account. The children’s influence was an important basis for project-oriented teaching and helped
the educators to weave in goals from the curriculum. It was emphasised that working thematically in mixed-age groups required a lot from the teacher but that when they started from what the children themselves showed interest in, they did not have to plan everything.

One of the participants described the work like this: “We include a lot of filters in the teaching […] We check all the curriculum goals once a year and see whether we have achieved them.”

The teachers argued that mixed-age groups made it easier for the children to learn at their own levels. The children were encouraged to help each other, which was regarded as an educational method. The teaching was individualised despite the age spread. According to the teachers, the children learned by listening to the other children’s experiences. Different types of questions also stimulated them in their learning processes.

5.2. Theme II: the children’s interests as part of the teachers’ teaching design
In this theme, the children’s interests were part of the teaching design. The teachers in both the age-homogeneous and mixed-age groups showed that they related to these interests but treated them and argued for them in different ways.

5.2.1. Age-homogeneous groups
The teachers argued that it was easier to capture the children’s interests when they were divided by age and in small groups. It was important for the teacher to know what the children showed an interest in when interacting with them in embedded and planned teaching. The teachers stressed the importance of giving children space for their own activities, such as play: “We have to give the children space to do what they want, we can’t control everything all the time. We have to make sure that the children can take the lead and finish playing. We adults can’t always be in charge.”

The teachers encouraged the children they taught to mix with other children in the playground. The ages of the children seemed to influence their play, but even so the teachers needed to be on hand to support the children’s interactions where necessary. The teachers also argued that play was important but decreased when the teaching was planned.

5.2.2. Mixed-age groups
The teachers said that they followed the children’s interests and then prepared and planned the teaching. In this way, the children had some kind of influence on both the spontaneous and planned teaching. The children’s interests were also visible in the preschool teachers’ documentation. In one of the preschools, a project ran for over a year and covered different parts of the curriculum: “We film ourselves and the children and sometimes when we watch our recordings, we discover things we had not seen […] then we see the children’s interests in new ways.”

The teachers described how the children were allowed to learn at their own pace and were not forced into anything, but that it was important to “start from what the children want to do and try, there’s no coercion”. The play was mostly open in mixed-age groups because that meant that the younger children could play with the older ones: “As we have different ages in the same group, the children’s interests do not need to be limited to what might be expected of a one-year-old or a five-year-old. In this way there are more opportunities for the children.”

5.3. Theme III: the teacher assignment
In this theme it was evident that the teachers’ descriptions of how they led and planned the education differed.

5.3.1. Age-homogeneous groups
The teachers argued that they led and planned their teaching on the basis of the curriculum and other steering documents, and that they directed the teaching towards the specific age groups they were responsible for. The teaching was embedded in the everyday activities and the teacher’s
task was to motivate the children to learn, stimulate their curiosity and develop their capacity to become co-discoverers. The education was therefore both individual and group oriented. One of the major advantages of this was that the same planning could be used for all four-year-old’s if they were divided into smaller groups. The organisation of the daily educational activities was also important. Although the teachers led the learning, the children also learned from each other all the time. Descriptions that emerged in the interviews were: “We put what the children learn into words” and “We teach all the time”. One of the teachers described their work as: “[...] co-researcher ... empathic, listening and asking a lot of questions [...] I don't tell them what they should say in ... the experiment or ... no they have to discover that themselves”.

One of the participants argued that the differences in the teachers’ educational strategies benefited the children. An example of this was someone working in a very structured way and another working in a less structured way. The participants argued that learning occurred when the children applied what they had learned. According to the participants, the teaching assignment included solving conflicts, building groups and socialising the children in the preschool.

5.3.2. Mixed-age groups
Here the teaching took place in cross-age groups with a focus on the group and individuals. The teaching was designed so that the children could contribute different knowledge and different experiences. The children were able to help each other because they knew different things and the teacher did not have to prepare for the exact needs of the various age groups. One of the teachers argued that an advantage of mixed-age groups was that the children did not need to compare themselves and their knowledge because there was always someone who knew more and someone who knew less. In the mixed-age groups, the children could learn from each other at their own level and pace.

The participants argued that working in mixed-age groups required a particular type of teacher attention to ensure that every child had learned what they needed to know in order to move from the preschool to school. This meant that a lot of the spontaneous teaching was based on the children’s play and interests, an overall theme or project. The teachers’ task was to include as many filters as possible in the teaching. The curriculum was one filter and a document that the teachers could check what they had done against. In all the teaching situations it was the teachers’ responsibility to motivate the children to become interested in the learning process. One participant said: “You could say that the curriculum comes into what we do; it doesn’t control everything, but we do take it into account.”

5.4. Theme IV: material and practical conditions and limitations
This theme highlights the practical conditions and how age affects the design of the educational environment and, thereby, how the teaching is conducted.

5.4.1. Age-homogeneous groups
The design of the rooms and the material and artefacts that were used were adapted and adjusted to a specific age, so that all the available materials reflected the needs of the children. However, this meant that the children (and some of the teachers) changed classes, and thereby learning environment, at least once a year. One of the participants summed it up as a dilemma: “Establishing relationships takes time [...]. When you change all the time, you have to build things up again and again. [...] I get really upset when the work teams are split up." Nevertheless, one of benefits of these changes was that the organisation and the work team were strengthened because everyone had worked with everyone else. The teaching was thus “transparent”, and the teachers could not simply say that things had always been done in this or that way. A change of unit for the teachers required flexibility and the ability to argue for “what you do and what you think”. This led to an increased collaboration that contributed to a common agreement in the educational practice.
5.4.2. Mixed age-groups
Here the environment was organised into activity stations, which meant that the children could do a lot of different things at the same time in the same room. The learning environment needed to be organised so that the materials and artefacts for all the various ages were in the same place. Certain materials were placed out of the children’s reach and could be requested. Maturity or age were not particularly relevant here. Rather, what the teacher team needed to think about was what every child could do and what they would benefit from. Rooms with special functions could be organised in the various units as and when necessary. One of the teachers argued that there was not the same kind of competition or assessment of the children when the rooms and the teaching did not signal: “You are three years old, you should be able to do this.” Another teacher said: “We introduce the children to the environment, where they can learn how to use the art room for example. They don’t get to do that when they have reached a certain age but when we think they are able.”

The diversity of the environment meant that the teaching could occur spontaneously, which also meant that those working with the children in mixed-age groups always needed to be prepared to step in and teach.

6. Discussion
Under this heading the results from the two different age formations are discussed together and are not separated as in the results. This is done to create a greater complexity in the discussion, and also to highlight the similarities and differences between the two types.

6.1. Embedded learning and the role of the teacher
According to the teachers of the mixed-age groups, the teaching should be embedded, i.e. integrated into the everyday activities and routines. This argumentation is in line with the idea that knowledge is developed in the daily practice (Hedges & Cullen, 2012) and together with others (Vygotskij, 1978). According to Dahlgren’s (2017) description, embedded teaching is understood as a common way of creating education in mixed-age groups. This is described as teaching strategies based ‘in-the-moment’ or as spontaneous planning that connects to the curriculum afterwards. However, in age-homogeneous groups, goal-oriented teaching based on the curriculum is preferred, even though some of the interviewed teachers also make use of spontaneous teaching in the everyday activities.

Based on the different strategies that were put forward, it would seem to be important for the pedagogy, regardless of the group constellation, to build on the children’s everyday experiences, informal knowledge and participation, as well as the teachers’ responsive pedagogical approaches (e.g., Hedges & Cullen, 2012).

The teachers of the mixed-age groups expressed that the older children’s learning was not negatively affected by having younger children in the group, but that older peers facilitated the learning of the younger ones. These findings do not corroborate earlier research (Ansari & Pianta, 2019; Edwards et al., 2009; Rouse, 2014). However, the results can suggest that the strong tradition of Educare (i.e. the combination of learning, development and care; Jönsson et al., 2012) in the Swedish preschool and the understanding of how to implement the curriculum in the daily education practice are still dominant in the mixed-age teachers’ planning strategies.

The local prioritised goals steer the teaching in both age constellations, although there are more arguments for this in the age-homogeneous groups than in the mixed-age groups. The discussions highlight that different age constellations require different teaching strategies, i.e. a teacher focused on knowledge development in a specific age range in age-homogeneous groups and someone with a broader view of the children’s learning in mixed-age groups. The teaching strategies in mixed-age groups requires flexibility in the scaffolding (Bruner, 1996) of children’s learning. Whereas the strategies in age-homogeneous groups seem to be based on a pre-planned
structure, the support structures, i.e. scaffolding, seem to be fixed and planned before the teaching takes place. The latter could be linked to a more school-oriented education practice in which curriculum-close planning is central (Jönsson et al., 2012).

6.2. Children’s interests and agency
All the participants point out that following the children’s interests is an essential aspect of their teaching strategies. However, the children’s influence on education is argued more strongly by the mixed-age teachers. According to them, children are regarded as a more significant resource than is the case in age-homogeneous groups (e.g., Logue, 2006). In addition, children in mixed-age groups have a greater age span, so that their participation and agency can inspire both spontaneous and planned teaching and connect to diverse parts of the curriculum (Magnusson & Bäckman, 2021).

In the mixed-age groups, the differences in age are made use of in terms of scaffolding (Bruner, 1996) and peer support. The teachers seem to implicitly argue that the children’s interests and agency activate their knowledge development. In this way, the curriculum becomes part of the learning process, not only in the teachers’ planning but also in the children’s everyday activities (e.g., Hedges & Cullen, 2012).

In the dialogue between the teachers working with mixed-age groups, children’s play seems to be part of the learning process. The teachers express that play and learning are connected, that play stimulates learning, and that the process of learning from the social level (interpsychological) to the individual (intrapsychological; Vygotskij, 1978) is especially stimulated by children of different ages. The interviews with teachers working in age-homogenous groups suggest that children’s play can be seen as part of the learning process but is mainly seen as separate from learning.

The teachers of the age-homogeneous groups argue that it is easier to adjust the teaching level when they know what the children’s interests are and that these interests are connected to the same age. In contrast, the teachers of the mixed-age groups describe that the education is based on the children’s interests and agency and is designed accordingly (e.g., Magnusson & Bäckman, 2021). The findings thus suggest that the teaching in age-homogeneous groups is more governed by the teachers than by the children’s interests. There is also more time for spontaneous teaching in the mixed-age groups because they undertake different activities in the same room during the day, which can open up to something new and unknown happening, and also for scaffolding from artefacts in the room, other children and the educators (Bruner, 1996; Vygotskij, 1978).

Children as assets is mentioned more by those working with mixed-age groups. Here the teachers talk about the children learning from each other (e.g., Vygotskij, 1978) and that they are not compared in the same way as they might be in age-homogeneous groups (e.g., Logue, 2006). The social and developmental issue is also raised to a greater extent by those working with mixed-age groups. Perhaps, as expressed, these social relationships also benefit language development in mixed-age groups, as Bleses et al. (2017) have pointed out. Based on previous research (Ansari et al., 2015; Bleses et al., 2017; Katz et al., 1990; Lindström & Lindahl, 2011; Purcell & Ansari, 2018), an engaging issue is whether it is always the younger children who benefit the most from participating in mixed-age groups, or whether in the long run this will benefit every child’s overall development. If this is the case, an important finding could be that aspects of the curriculum (The Swedish National Agency for Education, 2018) other than the subject-oriented, such as democratic rights and children’s influence, come to the fore in mixed-age groups.

6.3. Place, space, organisation and artefacts
The materials and artefacts are structured differently in the age-homogeneous and mixed-aged groups. Therefore, the findings suggest that children and adults will use the place, materials and artefacts in different ways and that the design of the learning environment both controls and allows different teaching strategies to emerge. The materials and artefacts are not linked to age in
the mixed-age groups, because here the site is organised in stations and artefacts may sometimes need to be requested. The children are individually introduced to the rooms and the artefacts based on what they are regarded as being capable of, regardless of age. Rooms and materials are therefore introduced strategically and over a long period of time.

In contrast, the environment for the age-homogeneous groups is adapted to the needs of a particular age group. The findings suggest that there is more teacher control in age-homogeneous groups and that this is reflected in the design of the learning environment. All the materials and artefacts fit the specific age group on the basis of what the teacher expresses that the specific age group needs and is capable of. According to the interviews, differences in the environment do not seem to affect the expressed teaching strategies to any considerable extent. However, if the children in the mixed-age groups are stimulated by what their older peers can do and already know (e.g., Vygotskij, 1978), the environment will play a major role in how the curriculum is implemented and the goals are met. In addition, the design of the rooms will support how teachers work with embedded teaching (Dahlgren, 2017) in the age-mixed groups.

The age-appropriate environment is favourable for creating a transparent work environment for teachers in the age-homogeneous groups. Nevertheless, even if the teachers work well together, the findings show that a dilemma with age-homogeneous groups is that it takes time to build a group in one environment (before moving on to another part of the preschool). As stated before, the teachers work differently in the two groups when using the materials, artefacts and rooms. However, the argumentation in both groups is based on the idea that the room and the artefacts scaffold children’s development and learning (Bruner, 1996). Additionally, the learning capacity in the zone of proximal development (Vygotskij, 1978) is expressed more by the teachers in the mixed-age groups.

7. Conclusion
When the teachers in this small-scale study express and discuss how the curriculum (The Swedish National Agency for Education, 2018) is implemented and which teaching strategies are put to work in the different age constellations in the Swedish preschool, some things are similar and some are different. The main findings imply that:

(1) All the teachers express that learning processes are based on the curriculum and local governing documents. Here, there is no difference in what is expressed.

(2) The teaching strategies in both age-formation include taking children’s interests seriously, which the teachers express with the support of the curriculum. However, the teaching and learning events in the age-homogenous groups appear to be more structured and planned. In the mixed-aged groups, the teaching is more spontaneous and embedded in the everyday activities.

(3) The teachers in the age-homogenous groups express that play can be a teaching strategy and that learning can include play, but that it is often separated from learning events. In contrast, the teachers in the mixed-age groups express that learning events occur out of children’s play and that the teaching follows the children’s interests in play.

(4) Learning and knowledge development are expressed as more scaffolded (Bruner, 1996) by children of different ages in the mixed-age groups. Whereas the teachers in the age-homogenous group mainly structure their teaching, i.e. scaffolding, on what is expressed as the children’s joint knowledge base out of the same age.

(5) A central teaching strategy in both group formations is expressed as “following the children’s interests”. However, aspects of care and questions of a social nature are highlighted more by the teachers in the mixed-aged groups.

The findings raise new questions for preschool teachers, school leaders and researchers concerning the implementation of the curriculum. One such question is: If children’s learning benefits from teaching strategies focusing on pre-planned learning, as in the age-homogeneous groups,
does this happen at the expense of the social relations and care in the educational practices? From this study we can conclude that more research on the teaching and learning aspects in mixed-age and age-homogeneous groups in the Swedish preschool is needed.

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**References**


