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Children's fundamental motor skills as a starting point for educational change within the learning environment in early childhood education and care centres

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ABSTRACT: The aim of the study is to analyse educational change around the indoor learning environment in early childhood education and care (ECEC) centres through interactive research. The educational change is focused on developing the environment in order to support children's exercise of fundamental motor skills (FMS) and it is about working with the professional learning of the staff. The study was conducted in Finland and examines which factors are central in educational change concerning the indoor learning environment. Nine ECEC units in five municipalities in the region of Ostrobothnia participated. The empirical data material consists of notes from supervision sessions, observations of children and self-assessment schedules by the staff at the ECEC units. The data was analyzed by the researchers based on a qualitative approach. The research results show that educational change can give the children more opportunities to exercise the fundamental motor skills when the learning environment changes. The results show on four themes – developing knowledge results in changing environments, clarity through goal formulation gives common striving, participation in organization gives responsibility and presence, willingness to change increases awareness – that have significance for more long-term and sustainable change in the everyday work in ECEC centres.

Keywords: *fundamental motor skills, physical activity, learning environment, interactive research*

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Introduction

The environment in early childhood education and care (ECEC) centres provides different opportunities for children to play, move and learn. In previous research, the design of the environment has been deemed important for what is possible for children to do and learn. The environment in ECEC centres can be seen as a learning environment, where learning and development can occur. Depending on how it is designed, the environment signals what kind of learning is possible (Hildén, 2016). According to the Finnish *National Core Curriculum for Early Childhood Education and Care 2018* (Finnish National Agency for Education, 2018), the concept of the learning environment includes physical, psychological and social dimensions. Björklid (2005) distinguishes between objective and subjective environments; she believes that the objective environment includes the physical environment and place in terms of size and location. The physical environment carries on traditions and ideas and sends out messages about what is expected to happen in the room (Björklid, 2005; Dahlberg & Åsén, 2012). According to Björklid (2005), the physical environment creates both conditions and obstacles for play and learning. If a children experience the physical environment as not sufficiently stimulating, inaccessible or insecure, they will not explore and play in the environment, which can hamper their physical, cognitive and social development. Dahlberg and Åsén (2012) emphasize the importance of considering the physical environment as active and flexible.

The subjective environment on the other hand includes the perceived environment, the experience of the individual or a group of individuals (Björklid, 2005). In general, children use the movement opportunities of the physical environment in ECEC centres, but teachers can still hinder children's opportunities for movement through different rules and principles (Sääkslahti, 2018). For example, an excessive pursuit of safety may prevent children from playing and testing their physical limits in the environment (Ministry of Education and Culture, 2016). Therefore it can be a challenge for teachers to give children opportunities to experiment and explore in the environment (Sääkslahti, 2018). According to Sääkslahti (2018), educators should create environments that allow different kinds of play for groups of children so that the content of their play supports motor skills and meets the need for physical activity.

According to Kyhälä et al. (2012), a high degree of physical activity and learning takes place in varied and unstructured learning environments, often created by children. When evaluating children's physical activities, it is important to study not only the teaching that is conducted but also children's own activities in different contexts that they helped to create (ibid.). Research shows a link between movement opportunities in ECEC centres and children's motor skills (Sääkslahti et al., 2019) and that physical learning

environments are key factors in children's development of fundamental motor skills (FMS) (Iivonen & Sääkslahti, 2014). However, some studies show that it is not enough to increase children's physical activity by simply changing the physical environment with, for example, sports equipment (Cardon et al., 2009; Gubbels et al., 2011).

On the other hand, research shows that if the environment is supportive, children are more physically active and spend less time in sedentary activities (Bower et al., 2008). A supportive environment includes factors in both the physical and social environments, such as attractive opportunities for organized physical activity, portable and stationary sports equipment, and trained and knowledgeable staff (Bower et al., 2008). Social environmental factors – such as smaller group size, play initiated by children rather than by adults, and positive encouragement from both teachers and peers – are associated with increased physical activity in children (Brown et al., 2009; Gubbels et al., 2011). On average, children under school age spend most of their daily time indoors, so the environment should encourage them to play and be physically active (Ministry of Education and Culture, 2016).

McWilliams et al. (2009) showed that ECEC centres have a strong influence on children's physical activity levels. Unfortunately, some evidence suggests that the ECEC centres' environments do not always adequately support children's physical activity levels (Pate et al., 2008; Soini, 2015; Soini et al., 2014). Based on previous research (Bower et al., 2008), it turns out that the physical environment and the social environment together support children's fundamental motor skills (FMS). Changing the physical, psychological and social learning environments takes time. As Timperley (2013) highlights, teachers need help and support from outsiders in educational change work.

Since the environment plays a major role in children's motor development and learning, we want to highlight and describe factors that may be central for educational change so the environment supports children's exercise of FMS. Learning environment in this study is understood as based on physical, psychological and social dimensions. This study's aim is to analyse educational change around the indoor learning environment in ECEC centres through interactive research. The educational change is focused on developing the learning environment, so that it supports children's exercise of FMS, which means that change needs to take place including the physical, psychological and social dimensions. The study seeks answers to the following research question:

• What factors of educational change are central when changing the indoor learning environment so that it supports children's exercise of fundamental motor skills?

The indoor learning environment as a support for children to develop fundamental motor skills

FMS are divided into three different categories: stability, locomotor and object control skills (Gallahue et al., 2012). Stability skills include those where balance is maintained in different situations such as bending, twisting and rolling. Locomotor skills comprise skills where the body is transported in a horizontal or vertical direction from one place to another, such as running, jumping and climbing. Object control skills include skills where the whole body and sports equipment or an object are involved, such as throwing, kicking and bouncing (ibid.). Research (Holfelder & Schott, 2014; Lubans et al., 2010) shows a connection between children's FMS and whether the children devote themselves to physical activity. A high level of competence in FMS is related to an increase in physical activity. Children who have developed good motor skills find it easier to participate in and devote themselves to physical activity. According to Gallahue et al. (2012), the interaction between environmental and biological factors determines how motor development takes place during childhood, and the environment has a major impact on children's physical and motor development (Sigmundsson & Pedersen, 2004).

In 2009, a comprehensive investigation was conducted regarding movement opportunities for children in early childhood education and care (ECEC) in Finland. Concerning the indoor environment, the investigation showed that 88% of the ECEC centres had access to a gym for physical activity or a special place for exercise either at their own ECEC centre or in the local environment. The remaining 12% did not have access to a gym in their own ECEC centre or in the local environment (Ruokonen et al., 2009). Ten years later, research showed that conditions indoor in ECEC centres had not considerably improved. About one-third of the ECEC centres still lacked a gym for physical activity in their own ECEC centres. Similarly, the supply of sport equipment is still very limited (Sääkslahti et al., 2019).

The Finnish Education Evaluation Centre has carried out external evaluations of early childhood education in Finland (Repo et al., 2019). The 2019 evaluation showed that in many ECEC centres, there are significant shortcomings in the activities that strengthen children's physical activity. About 30% of the ECEC units stated that children had the daily opportunity to be physically active indoors, and about 50% said children had the opportunity every week. On the other hand, about 50% stated that children had daily free access to various sport equipment, and about 30% said children had access every week. This means that approximately one-fifth of children sometimes or very rarely have the opportunity to be physically active indoors or use sport equipment freely (Repo et al., 2019; McWilliams et al., 2009).

According to Jämsen et al. (2013), educators in ECEC very rarely encourage children to do physical activities. Observational studies have shown that more than 90% of the time in ECEC, there is no encouragement for movement activities (Sääkslahti et al. 2013). Veldman et al. (2018) showed that in the ECEC centres with high intention points, children spent significantly more time on physical activities. This was also true where the role of teachers was also more active. Eriksson Bergström (2013) showed how teachers are gatekeepers in the use of spaces for certain play and that rooms can function as "limiters" for what children see as possible for play.

Based on previous research (Gubbels et al., 2011; Iivonen & Sääkslahti, 2014; Sääkslahti et al., 2019), the learning environment should be supportive and is a prerequisite for children to develop FMS. The learning environment also needs to be developed and changed for children's skills to be developed. Achieving a change in the physical environment by adding various sports equipment is not directly difficult, but changing the psychological and social environment requires more work. A change in these environments requires a change of the staff's way of thinking, the working methods and actions, in other words the professional learning (Timperley, 2013).

Professional learning in change and development work

When the learning environments in ECEC centres are to be changed and developed, it is a matter of working with the teachers' professional development and learning. Activity in this study means how the teachers stimulate and develop children's FMS based on the physical, psychological and social dimensions. By looking at the activity as changeable where people's interactions, conversations and knowledge have great significance, changes in the activity are a question of what conditions exist for employees to learn and develop, both as individuals and as a group (Larsson, 2016). Larsson (2016) pointed out that it is not enough for individuals to learn and develop without their individual knowledge being made visible to others, processed together and integrated into activities as new action structures.

According to Timperley (2013), teachers themselves are the main characters in their own learning, but they cannot always implement it on their own. Teachers need support from their leaders to implement systematic changes (Timperley, 2013). In order for leaders to know how to challenge and support teachers, the leaders must also be involved in the professional learning. Timperley (2013) pointed out that a learning system needs to be created in which everyone in the activity engages in learning.

Timperley (2013) pointed out that professional learning is not a process where you first learn new things and then learn how to apply them, but the enforcement is part of how you learn and understand the professional learning more thoroughly. Åberg (2009) believes that teachers must be given opportunities to develop professionally together with others – for example, through supervision and in reflective conversations about the profession. Teachers' motivations, commitment and learning increase when they are helped with assessing where they are located in relation to a goal and how they achieve it (Timperley, 2013). To change and improve an activity, teachers must deepen their professional knowledge and skills, Timperley (2013) believes.

A study conducted by Heikkilä (2013) resulted in a model for how to understand, support and analyse change and development work. The model was primarily developed for understanding processes of gender equality work in preschools and school but can, as we see it, also be explored in relation to other contexts where the development of learning processes is in focus. In this study, this model is used as a support and inspiration for the analysis of the empirical data.

The house model (Figure 1), according to Heikkilä (2013, 2019), consists of three houses that symbolize three stages in change and development work. The stages are called *private*, *internal* and *external* and are seen as organizational spaces where change and development work take place. At the private stage, change and development work are not organized and clear. By progressing into the following stages (internal and external) organizational spaces become clearer and shared, providing better conditions for the development work. These stages can be seen as where an activity is located in the work, depending on how far the process has progressed. In this study the different stages of the houses have inspired the analysis concerning how to understand stages of change and development work. Heikkilä (2013, 2019) highlighted five sub-areas that are important for achieving a sustainable change, which are presented inside the houses. These sub-areas can be used as supplementation, concretisation or steering assistance in the change and development work. The sub-areas are *attitude towards knowledge*, *leadership support*, *goals*, *organization* and *developmental climate* and can be described as intersections in the work.

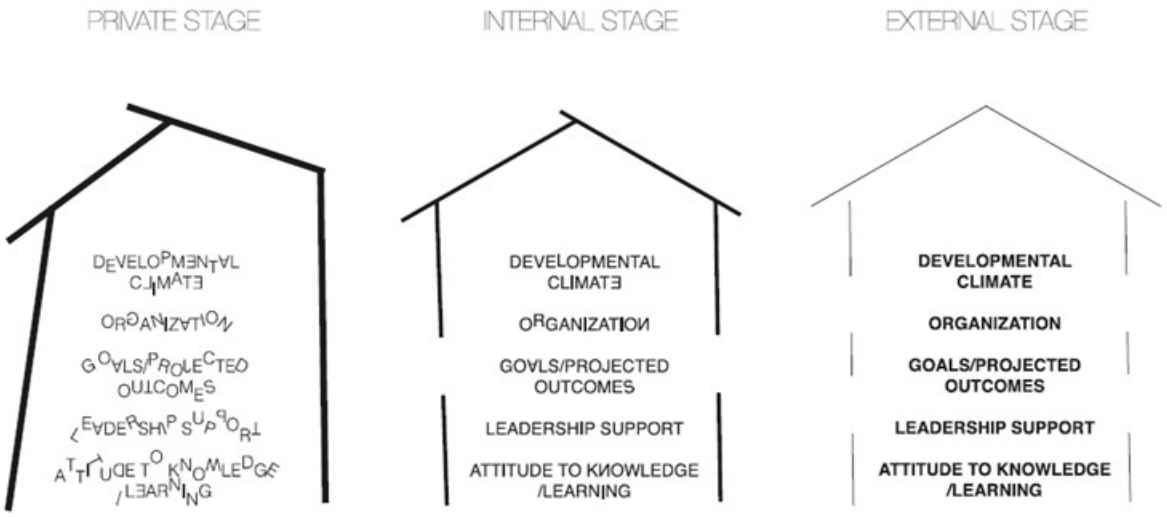

FIGURE 1 The house model describes three stages in change and development work as well as five sub-areas that are important for sustainable change (Heikkilä, 2013, 2019)

One of the five sub-areas is *view of knowledge*, which is seen here as the most central area and includes *attitude towards knowledge* and *awareness of knowledge*. The following sub-area, *leadership support*, means that management is behind the work and has an understanding of the content of the work. The support from management is based on the view of knowledge, which means that management also needs knowledge on the subject. The third sub-area, *goal formulation*, takes the work forward while at the same time concretizing the work and enabling discussions, follow-ups and documentation. *Organization*, the fourth sub-area, is a central part of the change and development work and includes available resources and determines the ambition of the work. The last sub-area, *developmental climate*, is another variant of *view of knowledge* and refers to the climate that prevails in the activity. In a good developmental climate, there is a will and openness to new ideas and new thinking (Heikkilä, 2013, 2019). These parts could also be discerned in the analysis of educational change regarding the indoor environment, and the concept of the house model served as a direction to understand and deepen the analysis in this study.

Method

This study's aim is to analyse educational change around the indoor learning environment in ECEC centres through interactive research. The educational change is focused on developing the environment so that it supports children's exercise of FMS. This means that the study is interested in the development of environments and educational change,

which are phenomena in social contexts. For these purposes, qualitative research methodology was used in the current study. Qualitative research means that the researcher describes reality through data consisting of written words – for example, field notes from observations or linguistic statements (Bryman, 2018). Denscombe (2018) emphasized that in qualitative research, the emphasis is on the researcher's role in the construction of data, and the analysis starts during data collection. With a question of a qualitative nature, method triangulation is suitable for fulfilling the purpose in this study and for getting an answer to the research question.

Participants

The study is part of a larger project in which five municipalities in Ostrobothnia and the Åbo Akademi University in Finland participated. One goal of the project has been to develop innovative indoor learning environments that promote play and physical activity and promote children's participation in ECEC. The entire project lasted from January 2018 to June 2019. The data collection for the present study took place from February 2018 to April 2019.

In the five participating municipalities, the staff expressed their interest in participating in the project and the municipal mangers chose the ECEC units, with their respective staff, who were allowed to participate. The participating groups in this study had very different starting points in terms of physical, psychological and social dimensions of the learning environment. The educational change started in every unit´s need for change.

A total of 16 teachers and 18 child carers in ECEC participated in this study, distributed into nine different ECEC units. Initially, 177 children participated in the observations, and a year later, 195 children participated. The children were 3–5 years old, and the number of children per group varied between 14 and 24.

Interactive research

This study is based on interactive research, which means that communication and interaction must take place with people who possess good, practically developed knowledge (Wigblad & Jonsson, 2008), and ECEC staff have been involved in the project. Interactive research is a development and a limited form of action research (Svensson et al., 2007). Svensson (2002) emphasized that interactive research is about trying, experimenting, imitating and testing, which means creating concrete experiences of what works and does not work in relation to any particular content. Furthermore, Svensson (2002) pointed out that it is not enough to carry out isolated experiments to bring about change, but the experience must be combined with reflection and analysis.

One of the article authors acted as both supervisor and researcher throughout the educational change work and can be said to have the staging research role (Johansson, 2008). The staging researcher is an essential participant in creating action and wearing the staff's attire, which means that the researcher carries with her pre-understanding and her collected knowledge of the phenomenon (Johansson, 2008). Based on the supervisor's pre-understanding and knowledge of the phenomenon, questions to the staff were asked during supervision sessions. The discussions and reflections during the supervision sessions contributed to the supervisors' staged changes in everyday work.

Timperley (2013) emphasized that for change and development work to be successful, everyone who participates needs to feel involved, which interactive research also points out. Participation in the process has been a central part of the study, and therefore all staff in each ECEC unit have participated.

Data collection

The data collection was done in several steps. Initially, observations were made of children's FMS, and then the staff filled out self-assessments on how they perceived the learning environments of their ECEC units. Then each staff group (3–4 participants) received supervision on four sessions, and during each supervision session, careful notes were taken. The content of the supervision sessions was based on the observations and the staff's self-assessments. The professional development 1 and 2 was about training for all participating ECEC unit staff (about 34 participants). Figure 2 illustrates the implementation of the data collection that followed the different stages of the educational change work. The educational change in this study constitutes the primary purpose, and data collection took place at the same time as the ongoing educational change work. In this study, the notes from the supervision sessions constitute the main empirical material and are therefore described in most detail.

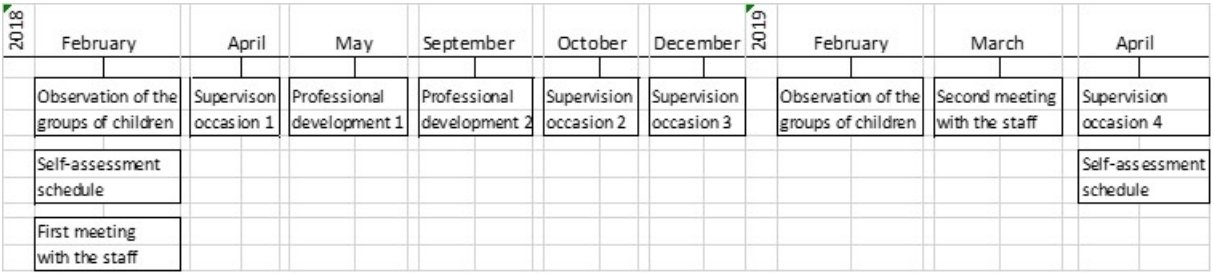

FIGURE 2 Overview of the different stages of educational change work and data collection

Observation

The first observation, which took approximately two hours, was carried out in February 2018 when the children were indoors. The following observation, which also took about 2 hours, was performed a week later, in the same spaces. In the structured observations, an observation scheme was used. Patel and Davidson (2019) point out that structured observations require that the observer is trained and well versed in what is to be observed. Forty students, in ECEC, were trained to observe children's FMS. The student received clear instructions about the observations regarding what was to be observed and how the observations were supposed to be documented. Their task was to observe what skills the children exercised, such as spinning, running, throwing, and what sport equipment's they used, for example balls, benches. They observed also how the children used the environment, for example in which places they were physically active. The purpose of the observations was to map and describe the learning environments, as well as to map the children's exercise of FMS before the educational change. The material from the observations constituted an evaluation and work tool in the educational change and primarily as a basis in the supervision sessions.

The same students performed both observations with the same group of children. The groups of children and the staff had changed to some extent from the first round of observation.

Self-assessment schedule

The staff filled in a self-assessment schedule after the observations had been implemented. The observations and the staff's self-assessment schedule were carried out independently of each other. The schedule was about the physical and social environment and how the staff perceived the opportunities for the children to exercise FMS indoors in everyday life. The self-assessment schedule consisted of questions, for example if children were allowed to throw balls indoors and if the staff encourage children to exercise FMS indoors. Each question had alternatives that the staff could choose between, such as never, rarely, sometimes or daily. To fill in was voluntary and 77% of the staff filled in the schedule and all departments had a response rate of at least 50%. The self-assessment schedule was, like the observations, an evaluation and work tool in the educational change. When the educational change and supervision was completed, about a year later, a new self-assessment schedule was sent to the staff, and the response rate was then 89%.

Supervision

Before the supervision started, the supervising researcher did a review of the ECEC units and analysis of the observations and the staff's self-assessment schedules. The observations and the staff self-assessments provided background information for the educational change. The purpose of the analysis was to understand and plan for how the supervision would be implemented. During the first opportunity, where all staff participated, a summary of the analysis was presented and in relation to the goals for physical activities in early childhood education (Ministry of Education and Culture, 2016).

According to Lendahls et al. (2005) supervision takes place over a longer period of time and the staff groups received their supervisions in April 2018, October 2018, December 2018 and March 2019.

During the group discussions at the supervision sessions, the supervising researcher asked the staff to reflect on and analyse their work that they performed between the supervision sessions. Lendahls et al. (2005) point out that through the supervision, the staff themselves must come to insight with regard to how the problem can be solved, which also the participants in this study did. At each supervision session, the staff formulated common goals to work towards until the next supervision session.

The supervising researcher wrote careful notes during and immediately after each supervision sessions which consisted of direct quotations, summaries and own thoughts, such as the example from one participating ECEC unit below. The data material consists of 5–8 pages of written text per ECEC unit. Altogether, 51 pages of data were derived and serve as the qualitative data for the current study. Another researcher, also an author of the current article, has reviewed and verified the accurate notes..

> On this occasion, the participants thought about what, how and why they have so far worked to change the environment. The participants emphasize that the sport equipment's are now available to the children and the children are inspired by them, builds different tracks and use them when they play. "We have also become more permissive and have a different attitude when it comes to children´s exercise of FMS". Together, they have reflected on rules they have had and on their own approach, which has contributed to a changed attitude.

The purpose of the supervision was to work in a more long-term and sustainable way with changing the learning environment in ECEC centres given to the physical, psychological and social dimension.

Ethical considerations

The study has followed good scientific practices regarding ethical considerations and data management, as stated in the *Responsible conduct of research and procedures for handling allegations of misconduct in Finland* (Finnish advisory board on research integrity, 2012). All staff who participated were informed about issues regarding confidentiality and that participation was voluntary. Since minors were included in the study, all guardians gave written consent for their children to participate in the study. The guardians were also informed about issues concerning confidentiality. It is not possible to identify staff, children or ECEC centres in the results. The students who observed the children in the ECEC units were also informed about the duty of confidentiality and ethical issues regarding data collection.

Analysis

According to Patel and Davidson (2019), qualitative investigations are characterized by the researcher trying to reach a deeper understanding of the phenomenon that the investigation focuses on. The data in this study was analysed with a qualitative approach. In a qualitative analysis, the researcher actively works with the data to sort, reduce and argue (Rennstam & Wästerfors, 2015). Fejes and Thornberg (2009) pointed out that a challenge with qualitative analyses is creating meaning from a large amount of data, which to some extent has been a challenge in this analysis.

In the analysis-and-interpretation process, the aim of the study and the research question were in focus. The analysis of the data material was done on the basis of an abductive approach in several steps. As the first step in the analysis process, the data was carefully read through several times. During the reading, aspects that could be central in the change process were identified for each ECEC unit, and the data material was encoded (Fejes & Thornberg, 2009). In the aspects that were identified and coded, the researchers were able to distinguish similarities with the house model's (Heikkilä, 2013, 2019) five sub-areas (attitude towards knowledge, leadership support, goals, organization and developmental climate). As step two in the analysis process, one of the researchers categorized the coded data material in relation to the five sub-areas to investigate and explore whether the sub-areas and concepts of the house model could be fruitful in this analysis.

As step three in the analysis process, the researchers searched, based on the coding for each ECEC unit, for patterns and similarities around the factors that emerged within each sub-area based on the sub-areas of the house model. The researches formulated themes based on the factors that were considered to influence change and development work.

Results

The results section describes the results of the analysis of the data material based on themes. In the data material, the researchers noticed things that did not lead to change, in order to be able to distinguish what did lead to change. The results accounting focuses on and describes the factors that contributed to a change and development within the various themes.

The descriptions of the themes are presented separately and are based on the *view of knowledge*, *goals*, *organization* and *developmental climate* in the house model (Heikkilä, 2013, 2019) but were developed and changed during the analysis process. *Leadership support* emerges to a certain extent but was not seen as decisive for the educational change studied in this study. In the results accounting, each ECEC unit has been assigned a fictitious name based on the planets – for example, Jupiter – for reasons of confidentiality.

Developing knowledge results in changing environments

The analysis shows that knowledge, at different levels, can be seen as an important factor of educational change in this study. During the supervision sessions, the staff groups were told that knowledge of FMS, knowledge of how the FMS can be integrated into everyday work, knowledge of the environment and knowledge of themselves were important components.

When the staff groups had developed their knowledge of FMS through continuing education that was given between the supervision sessions, based on material that was given to the ECEC units or on what they themselves had found out, their attitudes and ways of working had also changed. The material they received guided them in their work and was "a very good tool that is of great help to the team and easy to make each other aware of what we are going to work with," as the staff at Saturn expressed.

The analysis shows that the staff in several ECEC units mapped out the children's FMS, documented them in different ways and integrated them into different situations in everyday life and in physical activity sessions in a conscious way that they had not done before. At Saturn, the staff said the following about the mapping and the introduction of different skills in everyday life: "This year we have systematically mapped the children's FMS and working with them in different daily situations."

As the staff gained more knowledge about the physical environment, both in terms of space and equipment, they opened up and tried to see opportunities that the environment offered. At Mercury, all sports equipment had been placed in one location, and the staff noticed that it was not optimally placed and thought about how to better use the sports equipment. Eventually, they used several rooms for physical activities and placed the sports equipment in different rooms, which resulted in the children also being better distributed in the different rooms. The children were now able to exercise object control skills such as kicking and throwing as several rooms were used and the sports equipment was available to the children all times.

The staff groups talked about a common view of knowledge that they now have and that physical activities are now more permissible indoors. In the joint discussions, the staff discussed how FMS and other pedagogical activities could be integrated: "We have methodically introduced cross-movements in collections, at transitions, food situations and the like. Through regular training of, among other things, basic movements and cross-movements, we have clearly been able to see differences, that the children become more skilled and that the movements become more automated."

Before the supervision began, the staff considered that they were very permissive and that the children had opportunities to exercise FMS in everyday life, as the self-assessment schedule showed. During the process, the staff realized that this was not the case. As they gained more knowledge about themselves, the skills and the environment, their attitudes, approaches and thinking about the exercise of FMS in the indoor environment also changed. One participant expressed the following: "We have a completely different way of thinking now and are more permissive." This shows that their thinking and their approaches changed.

Clarity through goal formulation gives common striving

A significant result that emerged in the analysis is that formulation of goals was important to bring about change in the everyday work and environment. At Neptune, participants expressed the following about working based on the formulation of goal: "The guidance we received has made us remember to work goal-oriented with different skills for a long time." They formulated goals for how they should work with the FMS for a long time. All groups had different goals to work towards depending on where in the change process they were.

The formulation of goals within the various ECEC units ranged from developing and creating environments that stimulate to physical activities and consciously planning

movement activities to support and challenge the children's skills in daily activities to the staff themselves having to be present and active in the children's physical activities.

The staff formulated the goals based on the group's activities and needs and the goals felt meaningful and realistic. Since everyone in the staff groups was involved in formulating the goals and thinking about how they would reach them, there was an awareness and willingness to work towards the goals. Before the project started, the staff groups had no clear formulation of goals. Short-term elements of change had been tried by the staff groups, but they felt that a more long-term change was difficult to achieve. The formulation of goals helped them with the educational change because everyone could strive and work towards the same goals. The staff at Tellus commented: "Easier to work when you know what goals we have and what we all strives towards". In order to be constantly reminded of the formulation of goals, the goals were written in a visible place in some ECEC units, such as on a cupboard door.

Participation in organization gives responsibility and presence

A prominent result is that the organization of work is crucial to how the work is developed and changed. The project was initiated by the managers in the municipalities and through external financing.

During the supervision sessions, it emerged in the discussions and reflections that the staff experienced that it was so much new they should do. They thought about how they should organize the activity, and eventually they came to divide the assignments and responsibilities. Several staff groups organized the work so that everyone had their own areas of responsibility – for example, one staff member was responsible for the digital part, one for more movement in the afternoon and one for how the Christmas calendar contained movement elements. Everyone in the staff felt that they had an important function, and everyone felt involved. Even though the staff divided the responsibilities, it did not mean that someone else would not be allowed to work on the same task, but the responsibility was on the one assigned the task. Based on the formulation of goals by the staff groups, the analysis showed that the groups consciously planned and worked towards change in terms of the organization. Among other things, the children's group was divided into smaller groups, primarily for the sake of the children but also for everyone in the staff to take on their responsibilities.

Before the project began, the staff considered that the children had the opportunity to exercise FMS indoors, but the children exercised the skills very rarely, as the analysis of the self-assessment schedule and the observations showed. During the project, the staff thought about what and how they could work to change this. In discussions about the use

of different spaces in the environment, they now saw the possibilities instead of obstacles. They used all the spaces they had access to, including the hall and smaller rooms, so that the children could exercise their skills. The sports equipment was placed visibly in the ECEC units, and the children used it spontaneously in the games in different ways. The staff at Neptune expressed the following: "Now the children play freely between different rooms, and there will be more physical activities."

A clear result regarding organization is the staff's actions in everyday work and the environment. Tellus participants described their everyday work as follows: "The group is divided, and now the children are outdoors and indoors at different times, and this has led to us becoming more permissive and encouraging to movements and more active playing indoors. We also engage ourselves more to get all children to play and to be physically active." The quote shows that the staff are much more engaged in the children's games and participate in their physical activities – for example, the staff initiates various physical games with the children. The children are also more often encouraged to do physical activities indoors and are allowed to exercise the activities, which the following quote from Saturn shows: "We do not limit the children's running, but we give them opportunities for fast-paced games." As the sports equipment was now visibly in the environment for the children, they were also permitted to use the equipment in different ways. The staff have become more present and observe the children before they intervene or deny them.

Willingness to change increases awareness

The analysis also shows that willingness to change is a contributing factor to change and development. To achieve a more long-term and sustainable change, the developmental climate is very important. As everyone in the staff groups gave their consent to participate in the project, there was a widespread development climate in the staff groups that participated. It was clear that the staff members were willing to change and develop the indoor learning environment so it would support children's exercise of FMS.

As the project progressed, the staff showed an awareness of themselves around the change process. They explained that it was not simple and that there were divided opinions in the beginning, when knowledge was more limited. They thought and reflected on their ways of working and why they did as they did and how they could change to create a better environment for the children. As an example, the Venus staff repeatedly asked themselves why they had certain rules and removed the rules that they no longer considered necessary. A positive attitude toward educational change and a very flexible way of working, as well as the willingness to learn and develop yourself, are prerequisites

for bringing about change. Throughout the change project, a lot of changes took place in the ECEC units, as the staff at Tellus expressed, both in the physical environment and way of working but also in their way of thinking and attitudes toward movement indoors.

The results also show that the staff supported each other in different ways, partly by sharing their knowledge and partly by taking responsibility for different tasks in the change process. The staff tried, pondered, reflected, evaluated and did not give up. During the work, they constantly strived forward in the work. Despite the fact that it sometimes felt heavy, the will to change was strong amongst the staff groups. The results from the self-assessments showed that almost 90% of the participants believed that their approaches changed significantly with the project. During the last supervision session, the staff expressed that the project had strengthened and developed them in their work and given them tools to change the indoor learning environment so that it supported children's exercise of FMS.

Discussion and implications

Educational changes can give children more opportunities to exercise FMS when the learning environment changes based on the physical, psychological and social dimension. The results show that it is about professional learning of the staff. The results from this study show various factors of educational changes that are central when changing the indoor learning environment so it supports children's exercise of FMS. The analysis of the change process to find which factors are central shows that four themes are seen as more significant in the educational change.

What has emerged in this qualitative study is that knowledge of the phenomenon itself is very important to bring about a change. If you do not have knowledge of what you want to develop or change, it is difficult to bring about a change, and everyone in the team needs this knowledge for a long-term change to take place. In this case, the staff groups highlighted knowledge about various components as important for the educational change. Having knowledge of only one component or the other can make educational change difficult, which can be compared with what Timperley (2013) highlighted about professional knowledge and the development of skills.

In this study, the physical environment has changed and in comparison with studies (Cardon et al., 2009; Gubbels et al., 2011) which show that it is not enough to change the physical environment to increase children´s physical activities, the results show in this study that children´s exercise of FMS has improved. It is not only the availability of the

sports equipment that has contributed to change but also the staff´s approach to the use of the sports equipment and the attitude to the children´s exercise of FMS that are important results in this study. A prerequisite for the children to be able to exercise the object control skills is of course available sports equipment (cf. Repo et al., 2019).

Between supervision sessions, the staff groups purposefully worked on professional learning, and as Timperley (2013) pointed out, the enforcement was part of how to learn and understand professional learning more thoroughly, and that was exactly what the staff groups worked on. When the staff reflected on and thought about their approaches in the work and when they applied them, they learned to understand them more thoroughly. This happened in the everyday work between the supervision sessions.

To understand which factors are central in the change process, the formulation of goals appears to be important. Based on the overall goals for the entire project, all ECEC units formulated sub-goals to work towards in everyday work, and these sub-goals were important for the change. As Timperley (2013) expressed, the teachers' motivation, commitment and learning increased when they helped assess where they were in relation to a goal and how they could achieve it. When the staff felt involved and formulated the goals themselves, their motivation and commitment to the educational change also increased.

This study also shows that if change is to take place, the organization needs to be reviewed, and the staff themselves need to critically examine the organization. Before the project started, most of the staff believed that they allowed the children to exercise FMS indoors, but after the staff groups received guidance and examined their own organizations, it became clear to them that this was not the case. During the project, the staff groups worked on how to plan and organize environments so that they supported children's physical activities and the exercise of FMS. This can be compared with Bower et al.'s (2008) study that showed that physical activities reach a higher intensity level for children who are in environments that support physical activity.

Jämsen et al. (2013) emphasized that the staff in ECEC very rarely encourage children to do physical activities. Based on the results of this study, we see that the staff's approaches and attitudes toward movement play major roles in encouraging the children and letting them exercise FMS indoors. Repo et al.'s (2019) survey showed that about one-fifth of children sometimes or very rarely have the opportunity to be physically active indoors. Sääkslahti (2018) also emphasized that children in general take advantage of movement opportunities that the physical environment offers in ECEC centres, but educators may hinder children's opportunities for movement through their rules and principles. It also

emerged in the study that some rules were unjustified and perhaps prevented the children from exercising FMS in the indoor environment.

It is not always easy to change everyday work. The results show that the developmental climate is a very central factor to achieve a sustainable change. The staff groups in this study were very positive about the project, which can be seen as part of creating a relevant developmental climate. Larsson (2016) emphasized the importance of individual knowledge being made visible to others, processed together and integrated into everyday work as new action structures. This is very difficult to achieve in a staff group unless there is a good developmental climate in the group. The staff groups in this study developed new action structures for different contexts and situations, which also shows how they have changed their ways of thinking and approaching movement indoors. During the supervision sessions, the staff groups had the opportunity to reflect on and analyse their work together, which Åberg (2009) highlighted as an important part of developing professionally. In order for the physical environment to be seen as active and changeable, as Dahlberg and Åsén (2012) emphasized, there should be a positive developmental climate in the staff group.

The results of this study contribute important implications for ECEC centres' change and development work regarding the environment. This study focused on changes in the learning environment with regard to FMS but can also be applied in other processes of change. In educational change, it is important to involve the whole staff based on their work in everyday life.

There are some limitations to the study. The generalizability is limited by the fact that the results are based on only a few staff groups and the selection is from a geographically small area. With regard to the data collection of the observations that the researchers carried out at the ECEC units, shortcomings may occur despite a careful review of the criteria for the observations, but the observations did not constitute the main data material for the analysis. On the other hand, the notes from the supervision sessions constituted the main data material, and the supervision sessions could have been recorded. Despite the fact that the supervising researcher wrote down clear and accurate notes during and immediately after the supervision sessions, some important things may have been missed on these occasions.

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