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'The best guess for the future?' Teachers' adaptation to open and flexible learning environments in Finland

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ABSTRACT

Finnish education has recently experienced reforms with respect to guidelines forming the curriculum framework for basic education and school architecture. Since 2016, all new schools incorporate open and flexible design, at least to some extent. The more open school design challenges the conventional organisation of space and pre-defined structures and interaction practices. This study investigates how teachers both adapt and are affected by new demands for pedagogy, team teaching and teacher-student relationships. Interview data of 21 teachers of six modern schools are reviewed through thematic analysis. The new school layouts provided some incongruence with the teachers' aims and their preferred practices. Although many teachers were dissatisfied with the new or remodelled space solution, they felt that their school had developed as a learning community, with improved collegiality, and good experiences of team teaching had increased. Shared vision, open discussion, commitment and enough time for preparation had helped in adaptation. Lacking arguments behind school transformation and the dismissal of ideas of school design hindered adaptation. This study suggests that teachers should have a greater voice in the school design process, and the needs of learners should be carefully considered, ensuring optimal physical and pedagogical context for effective and collaborative learning.

KEYWORDS



Learning environment; school transform; teacher adaptation; school design; school architecture

Introduction and the context

Reforms in curriculum and learning environments

Finland is undergoing a strong phase of school redesign where traditional walled-in classrooms and rows of desks are replaced for more flexible, multipurpose, informal and transformative open plan designs. Since 2016, all new or totally renovated comprehensive schools in Finland have incorporated open and flexible designs and principles, at least to some extent. This reform of school architecture emerged at the same time as the curriculum reform of Finnish basic education (Ministry of Education, 2014), issued in 2016.

The new curriculum strongly advocates a phenomenon-based approach for learning across disciplines and emphasises learner-centred and inquiry-based approaches, technology-enhanced learning, student autonomy and developing schools as learning communities with

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distributed leadership (Ministry of Education, 2014). In phenomenon-based learning, themes such as real-world issues can be approached from different angles and subjects. The idea of phenomenon-based learning is not replacing the teaching of subjects, but to cross subject boundaries. Phenomenon-based learning has been seen as a response to the critique that traditional school involves too much theoretical and fragmented learning instead of focussing on real-world issues, problems and skills. At its best, the approach enables a deeper investigation into areas of personal interests beyond what the whole class is learning (Arvaja, Sarja, Niemi, & Pakkanen, 2020; Ministry of Education, 2014).

The curriculum and school reforms also have links with the focus on so-called twenty-first-century learning skills, such as critical thinking, problem solving, collaboration, creativity and leadership (Binkley et al., 2012; Carvalho, Nicholson, Yeoman, & Thibaut, 2020; OECD 2017; Wells, Jackson, & Benade, 2018) and the influx of digital technologies. The remodelling of school and classroom spaces away from deskbound whole-class instruction settings towards spaces allowing flexible and versatile use of groupings and instructional formats is seen among the factors facilitating achievement of the aims of the new curriculum and twenty-first-century learning skills (e.g. Benade, 2015). What is often left outside of the scope of studies is, however, the pedagogical approaches needed to scaffold these kinds of multiple and complex requirements for learners.

The introduction of a more open and flexible school design is considered to challenge not only the conventional organisation of space but also pre-defined structures, routines and interaction practices (Gislason, 2015; Saltmarsh, Chapman, Campbell, & Drew, 2014; Woolner, 2010; Yeoman & Wilson, 2019). Open and flexible learning environments can involve multiple classes, multiple teachers, and technology-enhanced common space without designated desks for students or teachers' podiums (e.g. Benade, 2016; Cardellino & Woolner, 2019; Carvalho & Goodyear, 2014; Imms & Byers, 2017). Larger units typically operate as adaptable work areas with movable furniture and acoustic curtains, allowing for flexible grouping for different learning activities and group sizes. The spaces allow versatile physical activity and movement and students to take up various positions in a variety of places (e.g. Blackmore, Bateman, Loughlin, O'Mara, & Aranda, 2011). The new kind of terminology replacing classrooms with learning environments indicates a change from physically bounded classrooms to flexible spaces (Wood, 2018).

In addition to the mere removal of walls and boundaries between spaces, physical school renewal typically also includes a reform of the learning and teaching culture (Saltmarsh et al., 2014). Openness "breaks" the material, social and cultural structure of traditional classroom and schooling, specifically by presupposing teachers work in collaborative work pairs or/and teams. The new spaces are designed usually for two class teachers and a special education teacher for a group of 40 to 60 students or four class teachers and special education and/or resource teachers for up to 100 students. Open spaces are likely to lead to changes in teaching practices towards more students working in small groups and one-to-one learning in contrast to frontal teaching because there is no distinct front, such as a teacher's desk or chalkboard, to teach from. School leadership is also assumed to be fluid and distributed among the leader-teams of a learning community.

For students, the opening of traditional classrooms provides more choices regarding the use of space, time, working groups and working arrangements and increased autonomy. Students typically have more opportunities for personalised learning and planning and

making decisions concerning one's learning, which requires taking responsibility for monitoring one's work (e.g. Yeoman & Wilson, 2019). With increased project-based and collaborative activities, students need skills to stay committed to shared goals, to reflect their learning processes, and to recognise challenges that may hinder their learning interaction. All in all, open learning environments in themselves do not guarantee productive learning; rather, it is dependent on multiple issues, such as the teacher's adequate instructional support, such as scaffolding, and students' capacities and resources for productive dialogue and regulation of learning. Figure 1 depicts the central concepts and elements that are assumed to contribute to effective and collaborative learning in any kind of (institutional) learning environment.

Open learning environments are a timely issue, not only in Finland, but in various countries where a corresponding reform of school architecture has been initiated already some time ago, such as Australia (Deed & Lesko, 2015; Saltmarsh et al., 2014), New Zealand (Carvalho et al., 2020; French, Imms, & Mahat, 2019; Wells, Jackson, & Benade, 2018), England (Boys, 2011; Cardellino & Woolner, 2019; Daniels, Tse, Stable, & Cox, 2019; Woolner, 2010) and Iceland (Sigurðardóttir, 2018; Sigurðardóttir & Hjartarson, 2016). In Finland, since 2016, open learning environments have become mainstream in basic education. As some other countries have reported problems arising from incompatible learning curricula to support the changes required by open and flexible schools (Woolner, McCarter, Wall, & Higgins, 2012), in Finland, a strong goal was to align the new school design with changes in the national curriculum towards a phenomenon-based approach.

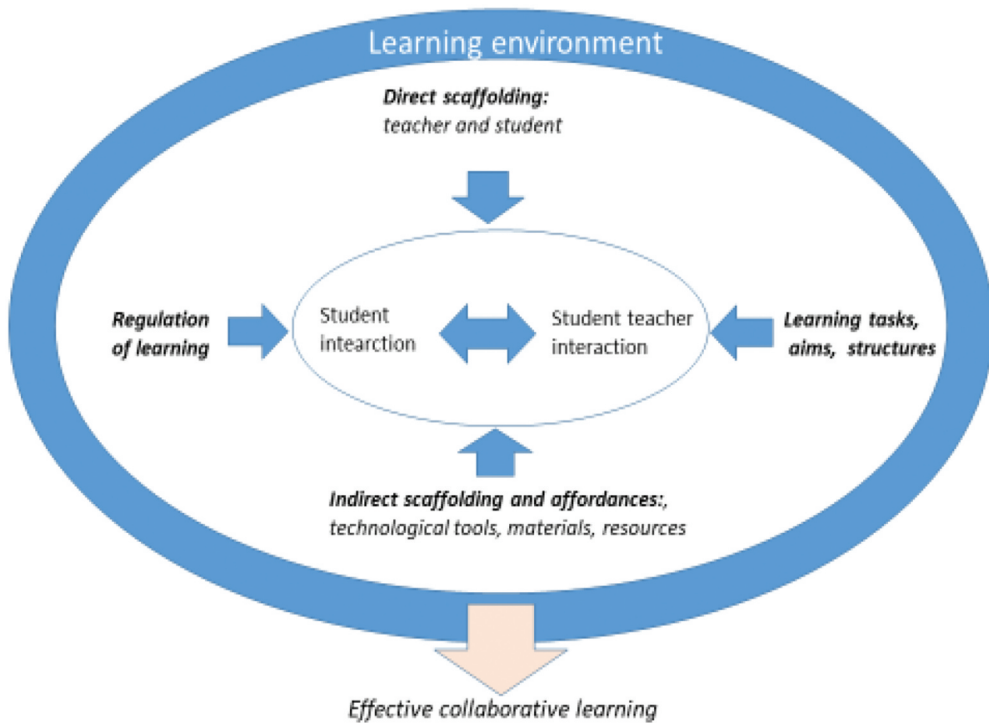


Figure 1. Central concepts and elements that are assumed to contribute to effective and collaborative learning in any kind of (institutional) learning environment

The specific features of Finnish education that are apart from many others are that schools in Finland draw their own curriculum based on the national curriculum and there are no nationwide standardised tests (with the only exception the matriculation exam at the end of high school), which gives teachers high autonomy for planning and implementing their teaching (cf. Biesta, 2015). The high-level independence and low-level direct control or test-based accountability of teachers (cf. Campbell, Saltmarsh, Chapman, & Drew, 2013) and trust and informality (e.g. Niemi, 2016; Sahlberg, 2015) have long been characteristics of Finnish basic education.

Theoretical background

Education and learning as embedded in social interaction

Concerning schools, it is imperative to pay attention to the interdependency of physical, social and material learning environments. People, social interaction, materials, spatial resources and pedagogical aims are all part of the learning environment and mutually constitutive. Thus, learning environments are formed of ecosystems of learning or distributions rather than just individuals (e.g. Goodwin, 2018; Leander, Phillips, & Taylor, 2010; Lemke, 2000). Unlike the traditional view of learning as something lodged inside a person's head, representatives of the sociocultural theory of learning (Säljö, 2010; Vygotsky, 1978, 1998), the theory of distributed cognition (Hutchins, 1995; Hutchins et al., 2010) and co-operative action (Goodwin, 2000, 2018) approach cognition as instances of embodied phenomena or action that are inseparably intertwined with the local, material environment. In a physical learning space, participants establish an interactional space (Goffman, 1971; Mondada, 2013) in which learning is enacted.

All the above-mentioned theories stress the role of interaction and learning as participating and “doing” that require an active role from the participant: a learner meeting the meaningful activity constructed by the interaction of cognition and embodiments with participants and artefacts (e.g. Goodwin, 2018). Processes of thinking and participating do not reside in individual minds, but rather are distributed across participants and their social relationships, mediational tools and learning environments. The question is then how is learning interaction constituted and what methods and resources teachers and students deploy to create opportunities for learning. Furthermore, it is important to examine the relationship between different learning contexts and learning trajectories across contexts and timescales (Leander et al., 2010; Lemke, 2000).

Aligning with these premises, teaching and learning in any kind of environment or situation can never be pre-defined in advance, but structured practices and design of space can enable or discourage opportunities for different kinds of interaction and enact teaching and learning (see also Tuncer & Licoppe, 2018). Sociocultural and distributed cognition theories also align with space as affordance (e.g. Gibson, 1979) and space as a social construct (Goffman, 1963). These views stress that people create and use their spaces by accommodating space to their interests and needs by utilising spatial, material and social affordances in specific ways they see as meaningful (see Goodwin, 2018). Taken together, there is no way to make a definite judgement about whether a new school building is good

or bad because it depends on multiple factors, many of which have to do with the teacher's work and pedagogical approaches.

This study asks how teachers adapt to open learning environments and how they experience the new demands for pedagogy, team teaching and teacher-student relationships. It has been stated that teacher adaptation is necessary for working in open and flexible learning environments (Alterator & Deed, 2013). Previous research has found that adaptation has been demanding for teachers (e.g. Saltmarsh, Chapman, Campbell, & Drew, 2015; Szczesiul & Huizenga, 2014), and regardless of changes in the physical learning environments, teachers had continued to use the same pedagogical practices they used in traditional schools (Carvalho & Yeoman, 2018; Cooper, 1981; Sigurðardóttir & Hjartarson, 2016; Woolner et al., 2012.) In addition, teachers' adaptation to the new spaces has been characterised as being strongly affected by institutional memory and routines, and there have been difficulties in creating a coherent pedagogy for open learning environments (Deed & Lesko, 2013). Kariippanon, Cliff, Lancaster, Okely, and Parrish (2018) maintain that many teachers are likely to have deficient skills for manipulating the learning environment and mastering multiple ongoing engagements. There have also been personal clashes between teaching teams (Campbell et al., 2013). Gislason (2009) has stated that successful teaching in open learning environments depends on the practices teachers implement in new learning environments and teachers' willingness to be committed to developing these practices. However, there is scant research on what issues have an impact on teachers' willingness to develop new practices and to be committed to those.

Research setting

The study draws from the teacher interview data of an ongoing study undertaken in six primary schools in Finland that were either purpose-built or totally renovated to contain open and flexible learning environments. At the time of writing this article, 32 schools in Finland have been built around the concepts of an open and flexible learning environment. The six schools in the present sample were not selected based on any specific criteria. They are from different areas of Finland, from the capital area to northern Finland. Two schools had been built or renovated at a fast pace due to indoor air problems and mould. The length of the school transition period varied.

The school spaces involved multiple classes, none of the schools had traditional corridors or same-sized classrooms with designated desks for students or teachers' podiums, there were fewer walls than in traditional schools, and the schools consisted of open, versatile and technology-enhanced learning spaces. Students were able to take up various positions in a variety of places while normally forming several learning groups, and teachers worked in teams. The students did not follow exact timetables; instead, their learning consisted of larger modules across disciplines. Each school was a public school (in line with 99% of Finnish primary schools), and the students typically came from the neighbouring area.

The data of this article consist of 21 interviews with teachers that were conducted during the years 2018–2019 and ethnographic field notes of the researcher. The very first open plan school in Finland started in 2016; thus, teachers' experiences of teaching in these schools varied, from one to three years. All teachers had prior experience of

teaching in traditional classrooms before entering new or renovated school spaces. A written consent procedure was followed where participants were informed of the goals and securing confidentiality and their data protection rights.

The researcher(s) observed the daily life of schools during a three-day to one-week period and collected and interviewed the teachers. For the data analyses, all interviews were video-recorded for later transcription. The questions were open-ended, and the interviews were similar to “natural” discussions focused on teachers’ experiences and views and experiences of working in new learning environments. In all, 21 teachers were interviewed in pairs, small groups or alone, depending on their preferences and practical arrangements. The interviews lasted 30–150 minutes, depending on the group size or teachers’ availability. In addition, ethnographic field notes and photos of the schools are used to provide contextual details of the settings. The themes teachers were asked about related to 1) school transformation, 2) their experiences of the new spaces and interaction practices, and how they used the spaces and resources in their teaching to support students’ learning, and 3) possibilities and challenges of new open and flexible learning environments.

The data were analysed using thematic analysis (e.g. Braun & Clarke, 2006; Patton, 2015, p. 540–542) by identifying and analysing themes within the data. The analysis was data driven, and the themes were created while doing the analysis. The focus was on capturing the themes of the interviews consisting of one or several utterances that formed a coherent idea, narrative or opinion. The analysis was discussed with some other researchers; however, the final decisions what to include and leave out were made by the author. The interview language was Finnish, and the excerpts of the interviews were translated into English. The transcription was conducted carefully to maintain the conversational style and chosen words. However, some modifications were made (e.g. some filler words are left out of the excerpts).

The analysis focused on the semantic content of the data; that is, the experiences of and meanings given to open learning environments by the teachers, regarded as the “reality” for themselves (see Potter & Hepburn, 2012). The interviews were conducted in local contexts, and the answers belong to unique persons in specific situations. The aim is not to provide universal and generalised results but to reveal something about the teachers’ opinions and experiences that also could tell something about the ongoing issues in general. These results do not represent the overall situation in Finland but provide examples of how teachers have adapted to the new learning spaces.

Analysis and results

School transformation as a bottom-up process

As described earlier, the new curriculum framework and new open and flexible spaces require and challenge teachers to collaborate more in developing phenomenon-based learning projects, modules across disciplines, engage in team planning and team teaching, and share responsibilities and to cultivate competencies in supporting students’ setting of learning goals and more individualised learning projects. As the very first new schools started in 2016, all six schools were still undergoing the transformation phase, as all of them had operated only one to three years in their remodelled or newly built design.

Educational change takes place both at the organisational level and on teachers' individual professional development. The adaptation process of school transformation can be seen as consisting of design, transition and implementation phases (Blackmore et al., 2011). The narratives of the interviewees described the adaptation process as a journey, which had started in the school design phase immediately after the decision for a new school. The interviewed teachers' stories of the ramifications of settling into the new learning spaces showed that educational changes do not constitute a top-down process, but a bottom-up process, which both allows and requires teachers to develop school practices and themselves as teachers.

Arguments behind school transformation

The adaptation process consisted, at least, of some contradictory feelings of pain from the changes, uncertainty about what is expected, also described as stepping out of one's own comfort zone, and enthusiasm to create and alter pedagogical practices. There was variation among teachers in the way they perceived and reacted to the possibilities of the new spaces. For some of the teachers, the explanations behind school transformation were unclear; they did not know who called for the new kind of school and why and who made the ultimate decision. In some responses, teachers thought that the explanation was that the new school could better serve the reformed Finnish curriculum by emphasising phenomenon-based learning and integration across different subjects. Teachers also longed for empirical evidence of the impacts of the new spaces and thought that the renewals were based on too-simplistic conceptions about what is critical in learning. Some teachers also thought that schools should have a more open door to the surrounding society, and the newly designed school was the best available response for preparing children for the unknown future.

You can interpret the new curriculum in many ways, but I think this open learning environment is a response to how a physical learning environment can also serve the new reformed curriculum and phenomenon-based learning. We did not have many pre-thought ideas, and the curriculum was changing at the same time as well. But we had enthusiasm to go and have a look at what a new learning environment can give for all of us. We were ready to take up the challenge and look to the future. (Teacher J)

You have to have a clear vision of what is the goal of renewing school spaces so radically. But for me, it is not. What is it? Sense of community? Renewal of teaching? Is the space the thing that enables you to do what is expected? (...) Where is the empirical evidence for these new schools? (Teacher E)

I do see the importance of phenomenon-based learning. However, it could be enacted in traditional classrooms as well; you don't need open spaces for that. Why in the world do we need these new spaces? (Teacher D)

First, we had to get rid of the pain of the change. We talked about the transformation, our fears and what we could wish from the new environment, what are good and worse scenarios. We compared the options. After this 'pain talk', we were able to plan our new school and we were committed to the transformation. (Teacher K)

We have to educate children for the future. But it is difficult to foretell what lies ahead. I think this open learning environment is the best guess for the future. (Teacher C)

Dismissed ideas of school design

Traditionally, schools have been designed by architects without any involvement of educational professionals. Nowadays, there has been a trend towards a participatory or co-design process, which has been believed to improve teacher practices and, in turn, benefit students' learning (Blackmore et al., 2011, p. 10; Sigurðardóttir & Hjartarson, 2016; Woolner & Cardellino, 2019). Some of the teachers were invited to engage in planning their new school. However, many of the teachers mentioned that it was not clear what their role in the design process was, how they were listened to and whether their opinions were appreciated. In one case, blueprints of the new school changed without notification of the teachers. The dismissal of at least some of the teachers' wishes and ideas concerning the school design hindered adaptation in the implementation phase.

We teachers were listened to in the planning phase; however, now it looks like it did not have any impact. It was only a formality. The bigger lines were drawn elsewhere on other boards. If you feel that your opinion counts, then you can feel a commitment to new spaces. Now it is the other way around. (...) I believe that architects do their best, but teachers and children are those who do the daily work in those spaces. (Teacher I)

As I remember it, when we were planning the school, the blueprints were very different. At that time, we were very satisfied with the blueprints, and we had only some little details to add or change. Suddenly, something happened to them. When there was the next meeting after three weeks, we got very renewed papers and blueprints. We were wondering where are all our previous ideas, but we never got any answer. (...) Afterwards we had black humour that whether it would have been better not to say anything. (Teacher B)

This school building is a compromise between the opinions of teachers, architects and policymakers who participated in the design process. However, in my opinion, a compromise is better than a viewpoint of one or two persons. (Teacher G)

Rethinking ideas of classroom

New schools challenged teachers to look at teaching practices differently. For most teachers, the idea of not having one's own classroom or being a sole teacher in a classroom was described as more or less a "psychological change" that teachers have to go through. Some teachers disliked the idea of making their own classrooms obsolete and were worried that if students and teachers cannot rely on stable spaces to work and interact with each other, this might lead to overly fragmented learning and dismissal of children's need for designated places. In addition, teacher-led practices were seen to be needed at times; for instance, for explaining and demonstrating concepts that are hard to grasp and master without the teacher's support. Many teachers preferred enclosed classrooms serving as a home base for children.

The idea that a corridor or dining room could be a learning environment is a big change. And that children are wandering in space without having any own private space. (...) In fact, you can't bring old things to the new one. You have to rebuild these ideas for yourself. (Teacher H)

There were many discussions about not having one's own classroom anymore. And we still have. Many of my students long for their own classroom and their desks; that's what they keep saying. I would like to step back a little to have a classroom and designated spaces for

everyone. I think that the removal of desks does not improve learning, as the drivers for improvement are other things. (Teacher N)

For me, new space itself forces me to think differently. The new school challenges change many of my previous assumptions and ideas. You are forced to think of teaching in other ways that are not pre-defined beforehand. I noticed that the idea of the new school was very compatible with my ideas of teaching and step by step, the new space started to feed my own and my students' creativity. (Teacher M)

Developing the school as a learning community

Orientation towards the new school is also a collaborative process at the organisational level and optimally provided opportunities and tools to negotiate wishes and values, to express unspoken assumptions, insecurities and fears, and to come up with an agreement or shared vision of the future school. In almost every school, teachers together with principals created a shared vision of goals, values, dreams and preferred practices of their future school and, thus, at the same time, developed the curriculum of their school. In some schools, teachers signed a written consent for commitment to the vision. In later recruitment processes, new teachers were selected based on how compatible their pedagogical thinking was with the school visions. Creating a shared vision of which everyone can feel ownership is also a way to develop school as a learning community. Open talk, or pain talk as one interviewee described it, was also a way to challenge previous assumptions. The role of the school principal(s) was highlighted as important pioneers of the transition process and nurturing an open and motivating climate. Overall, many teachers were satisfied as they were able to create a new environment, and for some teachers, a chance to plan a new school and create its practices were considered as a privilege.

We started to create visions. It was, that we systematically spent our time thinking about what a new learning environment does and brings about. It was the beginning. And we continued speaking our visions, and when the school was built, everyone had a kind of understanding of our new school. We committed that vision on paper, and everyone working here is committed to acting in ways that are compatible with our vision. (Teacher G)

Our vision was 'We will go there together.' Our principal was a leader and he has led this process wisely. In difficult situations, we can always count on him and on our community, and no one is left alone. (Teacher H)

Our proverb, stated by our principal, goes: We all are apples. We cannot let anyone sour; instead, we hold on to everybody even though speaking about difficult issues is painful. (Teacher J)

We share enthusiasm with our new spaces. We have a good spirit of doing. We don't transmit old practices. We transform them. Not every teacher can be involved in developing a new school and its culture. (Teacher F)

Taken together, these responses of interviewees demonstrate how educational change to a new kind of school is a remarkable issue. It needs careful preparation consisting of joint discussion, co-planning and creating a shared vision of the new school to which teachers can commit. Redrawing boundaries among teachers, new spaces and materials, and teaching practices and creating new ones opened up possibilities that had not existed before, which motivated many teachers.

However, the reasons behind the school transformation were unclear for many teachers. For them, it was not easy to see why school spaces have to be renewed so radically, and they were unsure whether the renewal of the school building could be the response to the demand for renewing the teaching and learning culture. The responses also pose a question of who can have the strongest voice in planning new schools: teachers, policymakers or architects. All in all, it seems clear that for teachers, it is easier to be responsive to new spaces if they can feel ownership of spaces and that spaces resemble their needs and their students. A shared understanding of the aim, the meanings behind changes and the experience of being listened to are some key features for the renewal of school buildings and school culture.

Mismatch between the school's layout and teachers' preferred practices

The implementation phase consisted of transitioning into the new school building and putting the created school vision into practice. This has meant continuous negotiation of spaces and resources, developing new practices, and establishing rules and protocols of use. For some teachers, the new school itself was a certain disappointment, and it seemed to them that there was a lack of perspective for the ultimate users: teachers and students. Some teachers also felt that their pedagogical knowledge and experience were overridden by architects and interior designers. The role of the different spaces and materiality was considered either absent or too deterministic (see Yeoman, 2018). Overall, teachers were puzzled about how interior architects can decide the furniture without any experience of teaching.

A couple of days before entering the new school, two interior designers gave as education a vision I called 'furniture pedagogy'. They tell that when children learn math, they need these tables and these chairs and for project-based work, there are these sofas, etc. Of course, I understand that good and multiple furniture could be a good thing, but the idea that furniture itself creates spaces for learning and for different needs sounds simplistic and ridiculous. (Teacher A)

We have those little rooms called phone boxes. Children use them when they want to have a break and quiet down. This is okay, but they don't use those spaces for learning. (Teacher B)

The aim of the transformative and flexible environment is that the spaces are versatile and enable multiple learning methods for different needs. Teachers had been aware that in their new schools there would be open, flexible and transformative spaces. They had imagined how these features would operate in practice (see Wood, 2018) and how doorless and unwallled the spaces are. Teachers espoused both open and enclosed spaces, and they valued the high flexibility of transforming open spaces easily into various constellations and groupings.

After entering their new schools, some teachers stated that the school layout did not afford different learning practices and groupings as spaces were not flexible or transformative enough. Although teachers worked in teams, they also had to work in big spaces with teachers and students with whom they did not co-operate; for example, due to the curriculum or grade. This caused learning interaction that was frequently disturbed or interrupted and distractions and noise were reported to cause stress and concentration difficulties both for students and teachers. Teachers stated that they had

to teach in the big open space, and it was considered impossible to transform into different partitions, and thus it did not support the use of multiple learning methods; in fact, some teachers said the situation was the reverse. Because of the parallel noise of the other groups, they reported that instead of multiple methods, they had to use teacher-led methods, in order not to disturb others.

In some schools, spaces were able to be divided into parts with acoustic curtains, but according to the users, the curtains did not block noise. Gislason (2009) has stated that the problem with acoustics and distractions could be solved by careful planning and timetabling. In this study, teachers reported that there were not enough spaces, and many groups were forced to study in the same big space. If the teachers and their students had to change space too often, there was a fear that learning becomes too fragmented. Some schools had already tried to overcome all these issues by reverting to building solid or glass walls.

We were promised that we would have transformative spaces. This meant that we would have easily movable walls. But it happened the other way around. Now the space should be transformative, but it is just an example of a big giant space that is acoustically disastrous. Everyone wearing hearing protectors is a sign that the architecture is insufficient, and many children and teachers are suffering. (...) My students have to change the place so often, that they have to create their learning space many times in a day and learning becomes fragmented. (Teacher F)

I will have to admit that my pedagogy in our big spaces is very primitive. We read learning books and fill activity books. You are not able to do anything creative and functional and not develop pedagogy because all the time you will have to take into account the others in the same space and take care that even your own students can concentrate on working. Thus, this kind of open learning environment, at least in our school, when there are a lot of students at the place at the same time, does not allow you to develop new pedagogy. For me, the salt of my work has been that I can find and develop new things into my pedagogical practices. But now it is the other way around.

We have this problem that it is impossible to arrange the spaces in order to make them peaceful for studying and teaching. In my opinion, this adaptability for silent work should be the premise and that you can open the spaces when needed. But the starting point was absurd enough. At least, according to my mind, concentrated and silent work should still be very important when studying. But if you are at the same time in five different lessons and you hear all the voices, it is very stressful. Stressful both for students and teachers, and at least for me it becomes very hard. (...) When I teach, I like to use playful methods like singing, reading, playing and listening. Now we have to do that in the open spaces. And I know that it disturbs other groups. Then I had to make a decision that I cannot apologise for my work. It is just that I can't do anything that I have to teach in open spaces. (...) But I don't know if it's right that in a way I have to feel guilty about my teaching. (Teacher B)

Spaces for privacy and creativity

There was also a concern about the lack of enclosed learning spaces and spaces for confidential interactions. Some teachers reported that students do not dare to discuss confidential and sensitive issues anymore, as they are not sure who can hear behind the curtains (see Goffman, 1981). Teachers also reported that children started to seek private spaces and develop strategies to protect those spaces (see Corsaro, 2003). One teacher described a situation in which children started to build a maths hut. It is

possible that children wanted to have a private and enclosed space for themselves. It is also an example of how spaces afford creativity to their users.

This kind of open layout does not support confidential and sensitive discussions with students, as they know that anyone can come into the space at any time and or there can be an overhearing audience behind the curtains. That is sad, as I have seen these discussions be meaningful to children's development, especially for teenagers. We also have some enclosed spaces that we can reserve in advance, but these confidential discussions usually start all of a sudden. (Teacher K)

One day during the math class, the children asked me if they could build a math hut. I told them they can do so. They carry those capsules. They set two capsules opposite each other. There is space for 6–8 pupils and they can sit inside. It's quite dim inside, but it's still bright enough. After building the math hut, they do their own math tasks inside. They work very well there. In my opinion, the idea of building the hut is great when pupils can study inside. The pupils know the rules of returning the capsules back to their own places; if we don't continue studying the same thing in the next lesson, or we start studying something new, the pupils know they have to return the capsules. (Teacher M)

Team teaching and increased collegiality

Implementing new practices has also meant a commitment to team teaching. Usually teachers were able to exercise some kind of choice with whom they wanted to work. Many teachers reported engaging much more than before in developing pedagogical ideas and practices together with other teachers and having to justify premises for pedagogical choice through new spaces. They had learned much from each other, and resources, materials and practices were more shared than before. Teachers also reported that tricky situations, such as clashes with students, conflicts between students or disagreements with parents, were easier to go through with colleagues. Teachers' collaboration and team teaching were also displayed as models of dialogue and collaboration for students. Teaching in open spaces made teaching more visible and public and, thus, using the same learning spaces enhanced the awareness of each other's strengths and increased overt sharing and adopting best practices.

All the teachers found positive issues for team teaching, and one teacher also said that it had required skills to work in new spaces where paired or multiple teachers were co-present all the time. Team teaching also demanded the management of professional relationships, compromises and trust. It also required the teachers to relinquish at least some of their prior autonomy of being the sole teacher in a classroom and to adopt and embrace shared practices and dialogues with colleagues, valuing and accepting the contribution of each team member and their unique ways of preferred action and goals. Many teachers highlighted how a lot of time is required for teachers to become a team. Trust between teachers became an important issue. Through collaborative culture and team teaching, the schools became learning communities in which everyone educates and can learn from each other.

The premise of co and/or team teaching is that the pair or team consists of teachers who get along together well and are willing to work together. Otherwise, it does not work. As its best, the other teacher(s) in your team is your support and shelter. Team teaching can reduce your workload and stress as you are not working alone but being a part of a working team. In practice, you are never alone. The help is around there. (Teacher M)

Tacit knowledge does not shift across walls. But in a team, it becomes visible. Now you can borrow or adopt something from your colleague. You don't have to 'steal' anymore. (...) We have had many good discussions on pedagogy. (Teacher B)

Before we used to discuss 'your class' and 'my class' and compare how someone's class is difficult and restless and some other's well behaving and achieving. In addition, we previously had clear answers who owns which place and so on and who is responsible and accountable for what. Now we have got rid of this kind of thinking and talking culture. Taking and sharing more responsibility has reduced individual accountability. (Teacher K)

Sharing space with others means that you have to give up your autonomy and trust in your colleague. You will have to trust your colleague. Without it, it would not work. However, trust has to be built; it cannot be pre-given. We need lots of time to build our team and trust between team members. You also have to accept the plans and enactments that your colleague(s) have made although you do not totally or even partially agree with them. You have to accept that the other's way to do teaching is as good as your own. (Teacher D)

Importance of teacher-student relationships

Teachers also reported that new spaces afforded more encounters with students and teacher-student relationships had been tightened. The new format afforded more informal encounters with teachers and students. Many teachers pointed out that teachers should have enough time to focus on their main goal: concentrating on students and their learning needs and goals and that navigating between spaces should not take too much time for that. Many teachers stressed that the most important thing, regardless of space, is the relationship with students.

I got a card from my students on which they had written that 'with you (means teachers) we can also discuss sunshine.' (Teacher M)

A child does not develop with an iPad but with an adult who not only teaches, but takes care of the children. (Teacher B)

Taken together, the implementation phase raised specific issues around the mismatch with the appropriate spaces for teaching and learning and for confidential interactions. Unlike previous research (e.g. Saltmarsh et al., 2014), teachers were willing to change their practices. They also found team teaching to be beneficial. Interaction between teachers and sharing pedagogical issues increased. The activities in the new schools also increased and deepened teacher-student relationships.

Concluding discussion

Collegial collaboration as the greatest source of support and assurance

This study sought to portray teachers' experiences of open and flexible schools and their ways of adapting to the changes that occurred in various aspects of their work. The six schools where the 21 interviewed teachers work are part of the modernising movement of school architecture in Finland. These schools were still undergoing the transformation phase, as all of them had operated only one to three years in their remodelled or newly built design. In their process of adaptation to a new kind of learning and work community, the teachers invariably mentioned collegial collaboration as the greatest source of support and assurance. On the other hand, adaptation had been hindered by a perceived mismatch between the school's layout and teachers' preferred practices and

pedagogical aims and frustration or discontent due to a dearth of participatory discussion explaining the motives and justifications for school transformation and dismissal of the teachers' ideas in the school design process.

The interviewed teachers' stories about the ramifications of settling into a new learning space showed that educational changes like this do not constitute a top-down process, but a bottom-up process, which both allows and requires teachers to develop school practices and themselves as teachers. At the organisational level of the school, a pivotal factor for successful adaptation is a shared vision, which is communicated in a way that supports experiences of ownership and commitment, which allows enough time for preparation, an open discussion culture and sharing, and which nurtures collegial support. In the design phase, collaborative preparation optimally provides opportunities and tools to negotiate wishes and values, to express unspoken assumptions, insecurities and fears, and to come up with an agreement or shared vision of a future school (see Cardellino & Woolner, 2019). In the implementation phase, critical elements consisted of sharing and doing things together, which aided teachers in planning and teaching in teams and helped in the negotiation of spaces and practices. Teachers described that they could adopt a flexible attitude themselves, as they knew that everyone had to be flexible, make compromises and trust each other. A school culture of open communication supported teachers in navigating through conflicts and tricky situations. The school principals played a key role in leading the transformation process and nurturing an open climate and, especially, allocating time and resources for team planning.

Educational change took place not only at the organisational level, but also in the new open spaces, which called for changes in teachers' individual professional development. Adapting to new spaces necessitated the development of novel practices of planning and structuring one's classroom practices and commitment to team-teaching. Team teaching required the teachers to relinquish at least some of their prior autonomy as the sole teacher of a classroom and to adopt and embrace shared practices and dialogue with colleagues, valuing and accepting the contribution of each team member and their unique ways of preferred action and goals. The interviewed teachers reported engaging much more than before in developing pedagogical ideas and practices together with other teachers and having to justify their premises for pedagogical choices through new spaces. Working in teams required time, but by and large, the teachers were satisfied with team teaching and co-planning (cf. Benade, 2017). Whether working as teams of teachers mostly reduced or increased teachers' workload could not be determined based on the interviews. Teaching in open spaces made teaching more visible and public and, thus, using the same learning spaces enhanced the awareness of each other's strengths and increased overt sharing and adapting of best practices. Taken together, much like in earlier studies of school development of the learning community, the overall teaching culture is improved when changed practices increase teachers' collaboration, create shared responsibility, reduce isolation and support continuous professional learning (Hargreaves & Fullan, 2012; Vescio, Ross, & Adams, 2008).

School layouts should support pedagogical practices

However, a more challenging aspect of adaptation at both the organisational and individual levels was that concerning the new physical spaces. The new school layouts were often seen to be in conflict with the teachers' aims and their preferred pedagogical

practices, or at least there was frequently a mismatch between the affordances of the space and the teachers' wishes. Teachers espoused both open and enclosed spaces, and they valued the high flexibility of transforming open spaces easily into various constellations and groupings. Teacher-led practices were seen to be needed at times, for instance, for explaining and demonstrating concepts that are hard to grasp and master without the teacher's support. Thus, for these types of situations, the interviewed teachers would have preferred teaching and studying in enclosed, quiet and undisturbed spaces in which teachers can prompt and scaffold students' learning without distractions and engage in dialogue with them. According to the teachers, open environments were less likely to encourage and lead to confidential interactions between teacher(s) and student(s) than more intimate spaces. Enclosed spaces that were not prone to overhearing or interactions being stopped by an audience (Goffman, 1981), and facilities such as places to sit, desks or tables were seen to afford educationally desirable learning. Unlike the views of Yeoman and Wilson (2019), an overhearing or overseeing audience can also impede classroom education.

In contrast to reports in the prominent previous literature (e.g. Kariippanon et al., 2018; Saltmarsh et al., 2014), teachers expressed the willingness to evolve their practices. However, the majority of the interviewed teachers conceptualised the new spaces as big open spaces, which for all purposes were not flexible or transformable. When the big space was seen as impossible to transform into different partitions, the practices that the teachers could deploy were described as a step backward rather than a step forward. When the large open spaces were occupied by several groups of students studying different topics or subjects at the same time, the teaching practices needed to be highly teacher-directed in order not to disturb other groups and colleagues. Learning in big open spaces meant that the learning interaction was frequently disturbed or interrupted. Distractions and noise were reported to cause stress and concentration difficulties for both students and teachers. In some schools, to overcome these issues, the solution has been to revert to building solid or glass walls.

Teachers and students should have an active voice

Teachers' adaptation to the new space seems to have been hindered by the lack of a participatory process in the design phase justifying the motivation and rationales behind school transformation and the dismissal of at least some of the teachers' wishes and ideas concerning the school design. Many teachers thought that on the ideal level, the new spaces can better serve the Finnish reformed curriculum, emphasising phenomenon-based learning, integration across different subjects and interactive learning and teaching methods, but for many teachers, the experienced and implemented practice was different from the goals stated in the curriculum guidelines. On a global level, many school renovation processes have been based on quite simplistic binary oppositions; for instance, the presumption that traditional schools provide passive, teacher-led, one-way learning, whereas modern spaces facilitate student-centred, social, digitally mediated and creative learning (see Bois, 2011). Physical space is usually seen as providing an overarching setting in which the nature of learning could be changed in a relatively mechanical and straightforward way (e.g. Kariippanon et al., 2018; Wesley & Imms, 2016).

The findings of the present study, along with prior studies on new learning environments, suggest that it is important to take into account multiple social aspects and understand their transactional effects on each other in non-deterministic ways. Granted that the key idea behind new types of learning environments is to provide better educational experiences and outcomes, the needs of learners should be carefully considered, ensuring the optimal context for effective and collaborative learning. As stated in [Figure 1](#) (p. X), successful learning depends on multiple elements, such as the teacher's scaffolding of the students' learning processes, effective behaviour and cognitive self-regulation, skill development and collaboration. Quality of education is acknowledged to be affected by instructional methods; thus, instead of binary oppositional statements diminishing the role of the quality of instruction and of teachers (see [Biesta, 2015](#)), it is critical to understand what different kinds of spaces are conducive to learning. As learning within any disciplinary field involves "ways of seeing, doing, and thinking and interacting across tools and representations" (see [Leander et al., 2010](#)), it is highly dependent on interaction, not just the space within which it takes place. Moreover, it is important to consider the needs of different learners and the critical aspects of space that are optimal for children who have difficulties staying on task, who suffer from neuropsychiatric disorders, or need greater stability or safety of the physical structure or more social or self-regulatory support to navigate in a community of learners.

The theoretical approaches, such as sociocultural theory and distributed cognition and affordances, can be highly informative for the creation of learning spaces to align the needs of both individuals and the interactive community, as they take into account both the physical and social construction. Learning is embedded and fostered within an ecosystem consisting of the learning environment and its material artefacts, verbal and embodied social interaction, and individual minds. Thus, the above-mentioned theories could be further utilised to understand the relationship between space, the intended aims and interaction in practice. This strongly suggests that teachers – and the prospective users including pupils and their parents – should have an active voice and ownership in the school design process from the conception all through the adaptation phase. According to [Barrett and Zhang \(2009, p. 4\)](#), "only when school is seen to support learning and create a positive experience, can we say it was designed successfully". In light of this study, it is highly recommended and crucial that new schools are co-designed by teachers who will subsequently be working there and that schools mirror the contemporary definition of childhood and effective collaborative learning rather than contemporary architectural trends or binary oppositions concerning optimal learning contexts.

All in all, when teachers are invited and engaged as participants in the school design process, compatibility between the aims of learning and needs of different learners is more likely to be ensured, the versatile nature of learning to take place in open, enclosed and flexible spaces is acknowledged, and the needs for leading and nurturing the learning community are taken into account, the new schools can contribute something that adds to what existed before. Then the new learning spaces can amount to – what one teacher described as – "the best guess" for the unknown and rapidly changing future for which children are being prepared.

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