Physical Environments of Early Childhood Education Centres: Facilitating and Inhibiting Factors Supporting Children's Participation

Abstract

A normative demand placed on early childhood centres by political actors and education theorists is that they should promote participation by children. Numerous publications have set out recommendations for early childhood teachers on how to promote participation in their day-to-day activities. The present study considers the role of the environment in facilitating children's participation through a visual environmental analysis, using photographs from two group environments in two different centres across three countries (Germany, New Zealand, and the United States). The analyses distinguished between environmental features of: transparency, structure, flexibility and responsivity, accessibility of materials, functional diversity, and representations of children in the environment. The findings demonstrate that a systematic approach to the analysis of physical environments can provide greater understanding about how environments may facilitate or constrain young children's participation in early childhood centres. This study contributes to the methodological development for this field of analyses in early childhood education.

Keywords: child participation, early childhood education, physical environment, visual environment analysis, cross-national research

Résumé

Encourager la participation des enfants est une exigence normative que les acteurs politiques et les théoriciens de l'éducation imposent aux centres de la petite enfance. De nombreuses publications ont formulé des recommandations aux enseignants de la petite enfance sur la façon de promouvoir la participation dans leurs activités quotidiennes. La présente étude examine le rôle de l'environnement physique dans la facilitation de la participation des enfants, au moyen d'une analyse visuelle de l'environnement utilisant des photographies de deux environnements de groupe, dans deux centres différents, de trois pays (Allemagne, Nouvelle-Zélande et États-Unis). Les analyses font la distinction entre ces caractéristiques environnementales spécifiques: transparence, structure, flexibilité et réceptivité, accessibilité du matériel, diversité fonctionnelle et représentations des enfants dans l'environnement. Les résultats démontrent qu'une approche systématique de l'analyse des environnements physiques peut permettre de mieux comprendre comment les

environnements peuvent faciliter ou gêner la participation des jeunes enfants dans les centres de la petite enfance. Cette étude contribue au développement méthodologique de ce domaine d'analyse pour l'éducation de la petite enfance.

Resumen

Actores políticos y teoristas de la educación han incorporado como norma la promoción de la participación de los niños en los centros de educación infantil. Un gran número de publicaciones incluyen recomendaciones para que los educadores de centros de aprendizaje infantil promuevan la participación de los niños en sus actividades diarias. La presente investigación considera el papel que juega el ambiente físico para motivar la participación de los niños, mediante un análisis visual utilizando fotografías de dos grupos en dos centros diferentes en tres países: Alemania, Nueva Zelanda y los Estados Unidos. Los análisis distinguieron entre características ambientes tales como: transparencia, estructura, flexibilidad y participación, facilidad de acceso a materiales, diversidad funcional, y representaciones de los niños en el ambiente. Los resultados demuestran que un método sistemático para el análisis de ambientes físicos puede brindar mayor comprensión sobre la forma en que dichos ambientes facilitan o restringen la participación de niños pequeños en los centros de aprendizaje infantil. Este estudio contribuye al desarrollo metodológico de este campo de análisis para la educación infantil temprana.

Introduction

Early childhood education (ECE) centres are frequently called upon to promote participation among children. These calls are often based in discourses on human rights and children's rights, as set out in the United Nations Convention on the Rights of the Child (UNCRC, 1989). Children's rights include the right to self-determination, the right to have a say on matters that affect their present or future lives, and the right to freedom of speech. UNCRC emphasises that children's rights apply to all children, including the very young. Participation should therefore be enabled in ways that are appropriate to the child's age. Calls for greater child participation have also been made on specific educational grounds, including philosophies of education that emphasise the importance of children's physical surroundings, which should reflect children's interests. This research study uses a qualitative analysis to explore how the physical environment of early childhood education centres can provide opportunities for children's participation. The research reported focuses on features of the environment that promote or hinder children's participation in ECE settings.

Children's participation is important in the context of democratic education. For Dewey (1916/2004), the opportunity for children to experience and try out various concrete, participatory ways of being with one another is crucial for learning about democracy. Similarly, Hentig (2003) regarded the school as a 'society in miniature' or a 'polis.' Preparation for later life in a democratic state is seen as a benefit to provide early opportunities for children's social participation. From the perspective of learning theories, children's active participation and involvement are seen as crucial preconditions for successful learning. Constructivist theory, for example, proposes that learning takes place through the interactions that children have with their environments (Piaget, 1970/2010). This requires children's active participation in those environments through exploration, reflection, and social interaction.

Participation in an active and contributory sense can be understood as an important precondition for learning and education. In this paper, participation of children is understood as providing young children (ages 3 to 6) with social and spatial contexts, in which their needs and interests are respected and, in which they can make their own decisions about their actions. This aligns with Percy-Smith and Malone's (2001) view that "authentic participation involves inclusion – wherein the system changes to accommodate the participation and values of children" (p. 18). From such a perspective, self-determined activities are foregrounded, as proposed by Francis and Lorenzo (2002), who identified seven realms for children's

participation including recognition of children's rights in institutional spaces, such as in early childhood education centres.

In this research, the environment is understood as the arrangement of spaces that can be influenced and changed by teachers, which includes furnishings, flooring coverings, and wall design, as well as work and play materials. It does not include architectural elements such as layout, placement or doors and windows, or room height.

Participation and the ECE physical environment

Participation can be understood as a normative task that aims to respect human rights provisions and fulfil educational goals. Early childhood education centres are faced with the question of how best to promote participation. In order to help teaching staff to implement participatory educational practices, numerous recommendations have been published in recent years to achieve this objective (e.g., Dobrick 2016; Knauer and Sturzenhecker 2016). General principles for participatory teaching have emphasised the importance of dialogue, listening, and taking children seriously. Specific strategies to promote participation include active listening and visualisation and also inclusion of children in opinion-building and decision-making processes. For example, particular attention has been given to the idea of establishing a children's parliament and of introducing a kindergarten constitution. Studies have nonetheless shown that, despite good intentions, adults often place less trust in children than they could. Adults fail to pay adequate attention to children when children give voice to their interests (Dockett, Kearney, and Perry 2012).

Participation is not only realised through social relationships and processes but also through the conditions in the surrounding environment. The importance of the physical environment has long been acknowledged in educational theory, for example, in Fröbel's notion of 'living rooms' (Stieve 2013); Montessori's conception of the 'prepared environment' (Montessori 1989); and through the theoretical ideas of Piaget (1948 / 2013) and Steiner (Uhrmacher 2004). More recently, early childhood education centres in Reggio Emilia have placed the social and physical environment at centre stage (Strong-Wilson and Ellis 2007).

Physical environments in ECE centres: Research and practice

The physical environment exerts its influence not only on the educational activities through intentional planning but also through non-intentional and incidental elements. The overall environment and its constitutive elements play a part in determining how it will be

experienced by children. The design of the physical environment is a complex process, as is its analysis. A method for analysing the physical environment has to take account of this complexity in an appropriate manner, including the functions the physical environment enables, such as withdrawal or role play.

In designing physical environments, economic factors have to be taken into account, as well as any relevant safety requirements and legal provisions (Petmecky 2008; Wilk and Jasmund 2015). Those who work and learn in early childhood education centres are a diverse group of people and the needs of both adults and children need to be considered. These may differ simply in accounting for the height difference between children and adults (Day and Midbjer 2007) but also because children and adults place value on different aspects of the environment (Morrissey, Scott, and Wishart 2015). The design of the physical environment in early childhood centres is the result of a compromise between various requirements and possibilities.

There has generally been a lack of research on the relationship between child participation and the physical environment in early childhood education centres. The most common measurement scales for measuring the quality of the physical environment of early childhood have usually focused on quantifiable factors, such as the number of square metres of space per child and the number of different functional areas in each centre (e.g., ECERS-R, Harms, Clifford, and Cryer 2014). Nonetheless, one study by Morrissey, Scott, and Wishart (2015) showed that including children in the design process for outdoor environments can help to generate new ideas on how best to adapt the environment to children's needs and interests.

A number of recent studies have focused on various aspects of the ECE physical environment, emphasising the importance of free space and the arrangement of the environment's constitutive elements to support children's physical activity (Bensel and Haug-Schnabel 2012; Kantrowitz and Evans 2016; Morrissey, Scott, and Wishart 2015; Sando 2019). Appropriate design of the environment has been found to positively influence children's play behaviour and social participation (Abbas and Othman 2010; Czalczynska-Podolska 2014; Read, Sugawara, and Brandt 2016). The physical environment has been discussed particularly in the context of the dominant paradigm of self-directed and active learning, through which the physical environment should enable children to explore their environment as independently as possible (Murray 2017). Stenger (2013) also demonstrated that the objects children use in their play can be understood also as symbols of their world. In

that sense, the physical environment and the objects in that environment are the materialisation of a child's world. The physical environment can be a reflection of the child's world and also as an educational medium (Nugel 2014).

The current study

The study uses a qualitative approach to explore the nature of physical environmental factors and potential relationships of these factors to children's participation in activities in ECE centres. The study employs a visual environment analysis (Knauf 2017; Knauf 2019) to identify indicators of participation, reflected in aspects of the physical environment. The analysis uses photographs taken in six early childhood education centres, sampled across three countries (Germany, New Zealand, and the United States). The analyses do not compare the level of participation across participating countries but seeks to identify resources and barriers for children's participation within ECE environments and not draw case or country-specific comparisons. The environments are also analysed from an adult point of view. Further research would be needed to incorporate children's perspectives on their participation in relation to features in the physical environmental contexts in their ECE centres.

Many countries who have ratified the UNCRC have also incorporated the child's right to participation into their own national legislation, for example, in Germany, this has been achieved through the "National Action Plan for a Child-Friendly Germany" (BMFSFJ 2010). And, although the United States has not ratified UNCRC, this has not lessened a normative impact on the importance accorded to children's participation rights in that country. In Germany, ECE emphasises care as a main aim (Scheiwe 2009). In the United States, academic preparation and school readiness are emphasised (Michel 2015), although there is no nationwide curriculum in the United States for children under the age of 5 years. In Germany, early educational planning can be understood through broad guidelines (OECD 2013). While ECE centres in New Zealand follow a comprehensive curriculum called *Te Whariki* in the early years (May and Carr 2015). The chosen countries show some basic differences in their ECE orientation, although all three countries have basic similarities, including voluntary participation by families, fee-based services, and similarities in the relative wealth and democratic systems that operate in these countries (OECD 2013).

The aim of this research is to identify environmental factors that promote or hinder children's participation in ECE settings. The research can provide an empirical basis for understanding different possibilities for child participation in ECE settings through the participative opportunities available to children through the physical environment.

Methodology

Research design

Six group environments in ECE centres catering for children aged between 3 and 6 years are included as the sites for these analyses. The environments were selected from three countries: Germany, New Zealand, and the United States. The centres included were operated by relevant local organisations in each country and two group environments from two different centres were chosen for participation in this research.

It is important to note that the photos included in the analyses focussed exclusively on the central group environment for a specific group of children within each of the six ECE centres. Adjoining rooms and hallway areas in any centre that may also have fulfilled particular functions, or enabled certain activities, were not included in these analyses.

Data collection and analyses

The research method is a form of non-participatory observation consisting of three stages. In the first data collection stage, photographs are used to systematically record the different elements of the environment. This ensures that the data collection is affected by the research process itself as little as possible. The photos record both the environment as a whole (through frontal photographs of all four walls and one panoramic photo) as well as elements within the environment that may relate to participation. Second, a detailed description (thick written description) of the environment is produced on the basis of these photos, which attends to the basic architectural layout, fittings and furnishings, learning and playing materials, and décor. Thirdly, the various environmental attributes brought to light by the thick description were then coded. In accordance with grounded theory, initial codes were identified via open coding (Breuer 2010). The rich descriptions have been drafted by the author; subsequently the descriptions have been checked and supplemented by a colleague who is familiar with the method of room analysis.

Central criterion for the selection if the centres was that they were committed to a high standard of pedagogical quality. German ECE centres included in this study have been selected on the basis of personal contacts of the author. In the United States and New Zealand advice for the selection has been given from local experts from Universities. The author approached a number of suggested centres and agreed on a personal visit. As children are not involved in the photos there was no permission necessary in Germany and the United States. In New Zealand the provider of the centres gave a specific permission upon application. The

author of the study visited all centres that are presented in this study in person and took the photos herself.

The analyses of the data were geared towards the principles of Grounded Theory, which states that 'all is data' (Bryant and Charmaz 2010). Following this approach, photographs were analysed in a similar way to how memos are studied. It differs from other visual methodologies, such as compositional interpretation or content analysis, which seek to find the iconic message of a picture by revealing the key idea behind the composition of a picture (Bohnsack 2011; Rose 2012) or by uncovering the narrative potential of a picture (Fuhs 2006). Such composition could be intentional, as well as non-intentional. In contrast the visual environment analysis employs the photo to document 'the situation' of the environment. This should facilitate low influence of the research process itself on the data collection. Nevertheless, the subjectivity of the researcher and the choices he or she makes during photographing of the room environment still might affect the data collection.

After initial coding, the codes were then rearranged in a process of axial coding within a pilot study (Knauf 2017) and adapted to the concerns of the present study. The final coding framework comprised:

- *Transparency:* The openness of the environment. This code takes into account those elements of the environment that allow easy visual capture of what the room has to offer and the current environmental situation.

- *Structure:* The division of the environment into different areas. This code refers to different areas, which are differentiated by the spatial design. Furniture or curtains divide the space and create structures that are difficult to change.

- *Flexibility and responsivity:* The environment's susceptibility to transformation by the children. This describes the versatility of interior design and explores the extent to which space can be used for various activities.

- *Accessibility:* The elements in the room (e.g. shelves, materials, information) can be accessible to children in different ways. This code captures the different degrees of accessibility.

- *Functional diversity:* This code captures prompts for specific activities. This includes the provision of a wide range of toys and learning materials, visual stimuli that might encourage reflection or memories, and opportunities for movement and rest.

- *Representation:* The ways in which children and their activities are depicted (e.g. via wall displays or items produced by the children).

These empirically developed codes align with other literature on ECE environments; for example, Ceppi and Zini (1998) identified transparency, flexibility and communication as criteria for designing environments in an appropriate way for educational contexts. The environments and environmental elements depicted in the photos were assigned codes in order to be able to make statements concerning the applicability of a code (and potentially its strength) in each environment.

Findings

The following sections describe our six study environments in terms of the six codes identified within the analytic process. The significance of the various codes for children's participation will be considered in the discussion section.

Transparency

Transparency refers to the openness of the environment for children. One of the main ways in which transparency can be facilitated or inhibited is through the arrangement of furniture. Shelving units, cupboards, and sofas used to divide up the environment, for example, serve to inhibit transparency – particularly when they are above the children's eye-level. In our six environments, there were a wide range of approaches to furnishing. In three of the environments investigated, many items of furniture were used to separate the room into different areas, while in the other centres, the furniture was almost exclusively arranged along the walls. Transparency was two cases inhibited through the use of curtains and other fabrics – although, since the latter are often translucent, they only partially block the view of the space. In certain cases (e.g., Figure 1), the internal transparency is supported by large-scale windows that allowed a view of the outside.

Structure

Arranging furniture within the environment serves to give it a structure. In five of the environments, different (functional) areas were marked off from one another using furniture. This often had the effect of creating smaller environments within the environment, as shown in Figure 2. Curtains were used for similar purposes, as were different floor coverings. Carpets, for instance, were often used to distinguish different areas, such as building corners. Wall displays and pictures in each area also helped to define the structure of the physical

environment. In two cases, however, the different areas were only intimated, such as when certain toys were only available in a certain part of the room. Figure 1 shows a very lightly structured environment containing only a few items of easily moveable furniture. Structure was created mainly through the use of wall displays, exhibition areas, and materials included at floor level.

[Figure 1 near here]

[Figure 2 near here]

Flexibility and responsivity

In two of the environments, the structures described above were imposed by means of large or heavy items of furniture, which offered little flexibility. Flexibility was also reduced through the sheer amount of furniture in the space. Other environments, by contrast, contained light items of furniture equipped with wheels, so that children could easily move them. Three also contained transformable furniture, such as tables, that could be slotted into one another and then separated again to be used as room dividers. There were also small pedestals that could be used for a range of purposes: as benches during assemblies, as building sites or display areas, or as walls in a den. Stools that could be turned over and used as small tables were also observed. All of the environments contained foam elements and curtains that the children themselves could manipulate. In four environments, there were also large open areas that could, in principle, be used for a variety of purposes. In addition, responsivity could be observed in large construction areas where children could build objects that were visible throughout most of the space. Figure 3 shows an example of such a structure created out of egg-boxes.

[Figure 3 near here]

Accessibility of the material

All of the environments contained toys and learning materials that children could access by themselves. These materials were most often kept in open shelving units or in boxes placed on the floor.

Two centres, however, provided different levels of accessibility for children. At the first level, there was freely accessible material at a height appropriate for children. At the second level, there were materials that were visible to children, yet beyond their reach and, at the third and least accessible level, we observed materials that were kept in closed drawers or

cupboards and that could neither be seen nor independently accessed by children (as with the cupboard in Figure 3). In two other cases, as in Figure 4, material was also kept in closed drawers and cupboards, yet these were labelled with photos and text so that children could understand what lay behind these closed drawers and cupboards. Access to delicate objects such as vases or handicrafts, or potentially dangerous objects such as scissors, were usually restricted. The different environments nonetheless varied significantly. In four centres, scissors and tubes of paint were displayed openly within reach of children; in the other two centres, even board games, pens, and sheets of paper were kept out of their reach.

[Figure 4 near here]

On closer consideration, significant differences could be observed even between those environments in which material were easily accessible. In three of the centres, toys were presented in a very inviting way that encouraged children to use them. Clothes used for dressing up were kept on hangers and, in one case, even on a tailor's dummy; an easel covered with paper was placed next to the paints, brushes, and clean water, inviting children to start painting. Figure 5 showed a chair facing a table with a mirror-lined cabinet, which might encourage children to style their hair or dress up in front of it. In other environments, by contrast, materials were packed away in cupboards and drawers and books were kept on shelves with only their spines facing out, so that children would have to search for a specific book. There were also differences with respect to the amount and diversity of the materials available. In one of the group environments, the only items within reach of the children were books, while in another, a wide range of materials were all freely available to the children in large quantities. The fact that these two examples were from within the same country indicated that such differences could not be attributed to country-specific characteristics.

[Figure 5 near here]

Functional diversity

A distinguishing feature of high quality early childhood education centres was the range of potential functions and thematic possibilities offered within the physical environments. In our six environments, we could observe a number of different functional areas. The environments contained materials for fine motor skills development – particularly in the form of drawing and painting utensils – as well as in construction areas. Other features were spaces for group meetings and joint activities, such as assembly areas. Two of the environments provided explicitly linguistic or natural-scientific/technological stimuli in the form of instruments (such as measures and scales); natural materials (such as animals, plants, and

fossils); and literacy workshops (using typewriters and stamps, for example). Three environments offered a variety of materials for sensory experiences, such as different floor coverings or musical instruments.

Representation

Children were represented in various ways in the different environments, though most commonly through photographs. These could be found in birthday calendars, on wall displays documenting collective projects and activities and on the covers of portfolio folders. In four centres, children's names were also presented within the environment – in the form, for example, of markings on the floor designating their personal assembly space.

Items made by the children themselves were equally prevalent within the environments. These included paintings, structures created using building materials, and handicrafts. These items could sometimes be observed at various stages of their creation – such as when watercolour paintings were hung to dry on a clothesline. Pre-prepared signs were also used to show who had made a particular building-block structure, as Figure 6 illustrates. Here the builder is not only indicated by her name, but also by her photo, so that all children could identify her. Furthermore, the mirrors installed in many of the environments also fulfilled a representational function. They allow the children to see themselves 'in action' and as part of the environment and the group. Figure 5 shows such a mirror.

[Figure 6 near here]

Discussion

This section considers how the environmental analyses of early childhood education centres might facilitate or inhibit children's participation. The findings of the present study yielded a number of insights from the visual environment analysis of six ECE centres, across three different national contexts (Germany, New Zealand, and the United States).

The environment analyses highlighted the significant variation in the visual presence of the learning and playing materials across the different environments – both with respect to its general visibility and how invitingly or discreetly these materials were presented. Children may require very different toys and learning materials depending on their personalities, interests, and capacities (Trawick-Smith et al. 2015). These needs vary depending on the time

of the day. The range of materials available can help to ensure that all children are able to participate in a variety of games and learning activities in early childhood education centres.

Opportunities for children's participation

For young children, in particular, a lack of physical accessibility can form a significant barrier to participation which can inhibit self-directed, independent exploration. The idea of self-directed activity is nonetheless central to educational conceptions of early childhood (Murray 2017). The furniture in the different environments can be distinguished in terms of its accessibility. This environmental analysis allowed for a concrete specification of what is meant by accessibility and accessibility is not only about height-appropriate furniture (Beaver et al. 2009). In our six early childhood education centres, accessibility was established particularly through open shelving units and boxes so that children could reach materials, as well as seating units that they could climb onto by themselves.

The variation in the accessibility of furniture and materials may be indicative of differences in teachers' beliefs about what children could, and could not be trusted with. In two environments, sensitive and potentially dangerous objects such as scissors were kept out of the children's reach, though in other environments children were able to independently access scissors. This variation may also be due to differences in the teachers' sensitivity to children's needs, as discussed by Dockett, Kearney, and Perry (2012).

Small items of furniture that children could see over help them to gain an overview of the environment as a whole and increasing such openness and transparency in this way can help to improve children's opportunities for participation. Yet, it is not only the size of the furniture that can influence participation but also its flexibility. Items of furniture that can be easily manipulated and used for a range of purposes allow children to adapt the environment for their own interests and needs. The six environments varied significantly in this respect. Two were dominated by heavy items of furniture, which were arranged in a static manner that left little room for change. Others were distinguished by light items of furniture on wheels, which could be transformed to fulfil different functions. The responsivity of the environment is therefore not only influenced by the availability of toys and learning materials, but also by the nature of the furniture in the room.

A decisive influence on the flexibility of the environment was also the amount of furniture in the environment. Figure 2 showed an environment with many items of furniture, which cannot be spontaneously transformed by the children. In contrast, fewer items of furniture, as seen in Figure 1, allowed for more flexibility for changeable arrangements to

meet children's needs. The arrangement of the furniture is important. Furniture that provides structured spaces in the environment can define different areas, yet it also restricts the free space available for children. Placing cupboards along the walls, as in Figures 2 and 3, served to create larger areas of space to be used flexibly. In promoting children's participation, an optimal environment might consist of a combination of small, light, and flexible items of furniture that extend into the room with heavy and tall items of furniture arranged along the walls.

Children's opportunities for participation, however, were not only manifested in the range of furniture within the environment and the way it was arranged but also in the way children were represented within the space. We were able to distinguish between forms of representation that depicted children in different ways (e.g., photos on a birthday calendar or a photographic display, as well as fleeting and situation-specific representations in mirrors). There also forms of representation consisting of objects the children had produced themselves (e.g., pictures, handicrafts, and built structures). These forms of representation enabled children to appropriate the environment in a highly visible way, since they left behind visible traces of their presence. Our six group physical environments differ markedly here. There were environments in which children were barely 'visible' and environments in which they were represented and 'visible' in a variety of ways.

Implications for practice to support children's participation

The visual environment analysis of group environments in early childhood education centres from three countries showed that children's participation can be facilitated through various features of the environment. Important variables identified were: design and quantity of furniture and its arrangement in the environment; accessibility, diversity, and presentation of learning and playing materials; and the kinds and kevel of representation of children. While there is no single right way to design the physical environment of early childhood education centres and a number of different strategies might be employed, depending on the available resources and opportunities to make changes.

The visual environment analysis method could be used by individual early childhood education centres to assess the propensity of their own environment to promote participation through the six codes of analyses (transparency, structure, flexibility, accessibility, functional diversity, representation). These factors could be used to redesign spaces and use of furniture, and the nature of materials used in early childhood settings.

Research limitations

Because of the small sample size, it was not possible to make any definitive statements about the similarities and differences across the three countries included in the study. The distribution of the facilitating and inhibiting factors for children's participation nonetheless suggested that the three countries were more similar than different. While internationally comparative studies across countries have gained significance in recent years to make comparisons on quality indicators (OECD 2017), this approach has not necessarily been viewed as a valuable way to merely compare different countries and education systems (see Alexander 2012; Urban 2017).

The present study also only assesses certain dimensions of the physical environment and children's possible participative experiences of the environment overall. A limitation of this approach is that the perspectives of children and adults were not taken into account, nor were forms of behaviour (e.g., play behaviour) and interactions (e.g., between children and between children and adults) because it only drew on still photographs. In order to generate a more nuanced picture, it would be necessary to triangulate the environment analysis with observational data and interviews. A further limitation is that the method only attends to visible elements, without taking into account other aspects such as the interpersonal and social environment, nature of the available materials, the size of spaces, and noise levels. The present study can therefore be seen only as an initial exploration of those environmental factors that may facilitate and inhibit children's participation in early childhood education centres.

Conclusions

The visual environmental analysis allowed for a systematic and qualitative evaluation of the physical environment and illustrated how this method can yield valuable insights. While this analysis involved data from three countries, the intention was not to make the focus a comparative analysis, especially given the number of centres involved. However, the findings suggested that there may be smaller differences between equally prosperous and developed countries and greater similarities in these high quality centres than quantitative comparative studies would suggest. Further research with larger samples of centred could be conducted to address this issue.

Participation can be understood as an important condition in ECE, nevertheless the younger children are, the harder this condition could be met. Thus, a central concern of this

study was to include spatial contexts into consideration. This paper provides first indications on how a careful examination of the physical environment might strengthen opportunities for children's participation. A redesign of spaces, furniture, and representations of children, as is proposed in UNCRC, can contribute to a spatial and social environment in which children's needs and interests are valued and where they have opportunities to be involved in decisions concerning their actions (Percy-Smith and Malone 2001).

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