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Title [Play Types, Design Principles and Participation in Play: How Is it Possible to Design for Participation in Play?](#)

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Abstract Many school-age children have difficulties participating in play and need support to find playmates, take the initiative and structure play. If children do not master these competencies, they risk

ending up in a spiral in which they are not given the opportunity to practice playing and develop play competencies. The purpose of the present study is to investigate how design principles in three different play types can be formulated in order to support pedagogues (educators) in developing new play activities with significant potential for participation. In addition, how these design principles cover more general and generic principles are scrutinized.

This paper is based on a three-year design-based research study in two Danish schools investigating three play types: creative play, role play and movement play. It also presents four design principles on each play type which were found to support the development of new play activities with inclusive potential. As a theoretical contribution, the design principles of each play type are meta-analysed with the goal of helping pedagogues generate play activities with different participation possibilities. The generic design principles are the *essence of play*, *play practices*, *play materials* and *play opportunities for participation*.

Keywords Play types, play at school, inclusion, participation, design-based research, design principles

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Play Types, Design Principles and Participation in Play: How Is it Possible to Design for Participation in Play?

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1.0 Introduction and research question

Research shows that children have difficulties in participating in play in school and finding relevant play activities that will keep them involved (Butler et al., 2016; Øksnes & Sundsdal, 2017; TrygFonden & Mandagmorgen, 2012). Based on a design-based research (DBR) approach (Barab & Squire, 2004), the main contribution of the present study is to scrutinize how design principles can be helpful in designing different play types and stimulating different possibilities for participation in play in schools. As an additional theoretical contribution, we propose four generic design principles based on the principles developed for the three specific play types.

The United Nations Convention on the Rights of the Child stipulates that children across the world have the right to engage in play and recreational activities (United Nations, 1989). To play is an existential part of being human and especially about being a child. In addition, playing is about *becoming* a human being. There are several political and pedagogical agendas that favour supporting children in play. For example, play is beneficial for children's health and physical, social and mental well-being; in addition, several developmental and learning benefits are related to play and playing (Gray, 2011; Whitebread et al., 2012, 2017).

When it comes to participating in play, as in many other aspects of life, children become better at playing by practicing (Aggerholm et al., 2018; Sloterdijk, 2013), but in order to start a game and find playmates, one must be able to recruit others, engage them and structure some sort of game (Butler et al., 2016). In other words, being able to play requires special skills that are best acquired by participating in play (Kvelling, 2013; Mouritsen, 1996; Øksnes & Sundsdal, 2017). Children who do not master these competencies risk ending up in a spiral, where they are not given the opportunity to practice playing and develop play competencies. Without those competencies, children are not able to improve their opportunities to participate in play communities in schools (Jørgensen, 2022; Jørgensen & Skovbjerg, 2020; Skovbjerg, 2021).

In order to support children's participation in play, pedagogues¹ have an important task. In order to meet the UN Convention's requirements, we must help children *engage* in play. We must design pedagogical frameworks for play which can balance child-initiated play and the need to help children who are not able to establish play communities and participate in play by themselves.

In 2014, a new act for Denmark's primary and lower secondary schools came into force. The aim was to increase academic standards and ensure that all children reached their highest academic potential (Danish Ministry of Education, 2014). The greater focus on learning included longer school days and an increased role for pedagogues, who were expected to contribute with more varied teaching activities. At the same time, the prolonged school days limited the time for free play in the leisure time activity centre. This development in the Danish school system reflected an international tendency in education which Gert Biesta has called "the learnification process" (2022, p. 58) and which is contributing to a delimitation of play in school.

Denmark and the other Nordic countries – like many other Western countries – are facing a well-being crisis among youth, with the psychosocial environment in school appearing to play a crucial role (Nordic Council of Ministers, 2022). At the same time, research indicates that pedagogical perspectives and work currently play only a limited role in schools (Gravesen & Ringskou, 2018). Against this background, this project was created by the research team and one participating school's pedagogues, who had experienced challenges in children's well-being and a decreasing tendency to initiate play.

In order to provide pedagogues with strategies to support children's participation and develop strong play communities, we have explored and developed the design principles inspired by DBR (Barab & Squire, 2004; The Design-Based Research Collective, 2003). The intentions were to develop design principles which would support pedagogues in coming up with new types of play activities that have participatory potential for children.

The research question investigated in the present study is as follows: *How should design principles in three different play types be formulated in order to support pedagogues in developing new play activities with great potential for participation, and do these design principles suggest more general and generic principles?*

Below, we present the research context, method and analytical strategy, after which we clarify the central theoretical concepts we employ. The results are structured as a presentation of the analysis on three design experiments about creative play, role play and movement play, respectively. Each play type results in the formulation of four design principles; we draw on these 12 principles to propose four general principles that can encourage participation in play. Inspired by Baumgartner and Bell (2002), we end the paper by presenting a meta-

¹ 'Pedagogue' is the title used in Denmark for a bachelor degree in social education and for preschool teachers, who are trained to work holistically with children.

analysis in which the design principles for creative play, role play and movement play are transformed into four generic design principles (Gundersen, 2021). Those principles can be applied by pedagogues when they want to design for play activities in school in order to facilitate the development of an inclusive play environment.

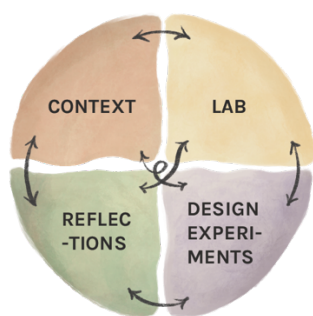
2.0 Research context, method and analytical strategy

The development of the design principles is based on the empirical findings in the research project “Can I Join In? – About Play, Inclusion and Communities in School” (2018-2022), which was funded by the Independent Research Fund Denmark. The empirical material was developed through 18 months of cooperation with two schools in a DBR study (Barab & Squire, 2004; Christensen et al., 2012). DBR is an intervening research methodology in which practitioners and researchers collaborate to create and initiate processes of change (Euler, 2017) in order to develop context-sensitive knowledge which meets the “dual goals of refining locally valuable innovations and developing more globally usable knowledge for the field” (The Design-Based Research Collective, 2003, p. 7). DBR is inspired by pragmatism (Dewey, 2008), and its aim for knowledge production is to create change in the world. More specifically, in DBR a number of experiments are developed and organized in an iterative fashion, with adjustments made on an ongoing basis to achieve the intended changes (Barab & Squire, 2004). In practice, this takes place as alternations between planning and reflection workshops and examinations of the play experiments developed, so that theory and practice and reflection and action all enrich one another through the various iterations (Jørgensen et al., 2021).

In order to structure and ensure this back-and-forth between planning, trying out and reflecting, we organized the activities in the project based on DBR models in Amiel and Reeves (2008) and Christensen et al. (2012).

- Context: Together with the pedagogues, we explored the specific play types with which we wanted to work in relation to play and participation in schools.
- Lab: We identified four design principles that we applied in creating play activities.
- Design experiments: We tested the play activities in real-life contexts with children and pedagogues.
- Reflection: We reflected together with the pedagogues about what we had experienced and learned and what we wanted to bring into new iterations.

Figure 1: The DBR model that structured our work



In relation to testing the design experiments, we applied short-term ethnographic fieldwork (Pink & Morgan, 2013); for methods, we used observations, participatory observations (Spradley, 1980) and go-along interviews (Kusenbach, 2003). We preserved the experiences by visual documentation (Pink, 2015) and by writing fieldnotes (Emerson et al., 2011). All data were produced in accordance with applicable parts of the European Union’s General Data Protection Regulation; parents consented in writing to their children’s participation, and *The Danish Code of Conduct for Research Integrity* has been followed. The present study is based on empirical material from three out of five play experiments that involved creative play, role play and movement play, respectively. The experiment on movement play was affected by restrictions related to COVID-19. Each experiment lasted for ten weeks and was developed on the basis of the experiences and ideas of the researchers, pedagogues and children.

Figure 2: Overview of the process of each iteration with play types



Table 1: Overview of materials in relation to the three play types

	Experiments	Written fieldnotes	Visual materials
Creative play	9	32	150+
Role play	8	23	100+
Movement play	6	13	75+

The play experiments took place at two schools in different parts of a larger Danish provincial town. The first is in a socioeconomically well-off area; there are approximately 350 children in the after-school centre, and 25 pedagogues are employed. The play experiments took

place every day in the afternoon after the teaching, beginning at approximately 14:15 and typically ending as the children were picked up by their parents. The children were free to choose whether to participate, but were encouraged to come every time the various play experiments were conducted. The second school is located in a district with poorer socioeconomic conditions and a large proportion of students with a minority background. Its after-school centre has approximately 170 children, and 15 pedagogues were involved in the project. The play experiments were placed into the “additional teaching” category on the same day every week; it was mandatory for the children to participate.

2.1 Design principles

As noted in the introduction, we worked systematically with design principles in a process that had largely been untested in pedagogical research in Denmark (Gundersen, 2021). In the DBR approach, design principles constitute an important part of the process and guide the design in a certain direction in relation to form, practice, function, aesthetics and so on. Very often, the ambition in DBR is to identify best practices and then implement those methods. In this project, however, we have sought new challenges and future possibilities (Jørgensen et al., 2021). The development and formulation of the principles are part of the method, the analysis and the results, so the contribution of the present study involves both the analysis of the design principles and the generic design principles themselves, following Baumgartner and Bell (2002). Before the first experiments began, the design principles were examined through an analysis of the literature and available practice experiences that took the form of untested hypotheses or assumptions (Euler, 2017, p. 10). In the iterative process of developing ideas, formulating design principles, testing them in practice, reflecting on them and reformulating the design principles, those principles improve and become more and more solid (Christensen et al., 2012). The design experiments evolve from a very concrete level related to individual design experiments to more abstract levels geared towards making theoretical contributions (Euler, 2017, p. 8). In the present study, we developed design principles related to three play types, on the basis of which we created more generic principles as our theoretical contribution.

According to Baumgartner and Bell (2002), design principles should be considered pragmatic tools – the purpose of which is to help practitioners generate designs that work – without necessarily focusing on how they are generated. Designing for play is a context-sensitive matter, and it is assumed in DBR that the utterance of the experiences related to the design process is limited by the fact that a great deal of knowledge is tacit (Baumgartner & Bell, 2002). Although production of general theories is an ideal in research, the design principles must reach a pragmatic compromise between abstract principles with vast

explanatory value and more specific and context-sensitive principles (Gundersen, 2021).

We conceptualized four design principles for each play type to make them as applicable as possible to pedagogical practice, just as we formulated them in imperative in order to strengthen their instructive power.

2.2 Analytical strategy

The analytical process was structured in such a way that the sub-analyses of the three individual types of play were carried out separately, after which the design principles were meta-analysed across play types and synthesized into four generic design principles. This design process can be messy, but the DBR model inspired by Christensen et al. (2012) helped us go back and ensure that our reflections and insights along the way could be incorporated into the design principles. Since the play experiments were organized as a series of interventions with only one type of play at a time, the design principles for each play type were developed individually. During the same period when the play experiments were carried out, workshops were held in which the design principles were discussed and reformulated in collaboration with the pedagogues, following the values of DBR (Anderson & Shattuck, 2012). From the start of the project, it was determined that the play experiments should be informed by a theoretical understanding of play (Skovbjerg, 2021) and play types (Hughes, 2006). After all the play experiments were completed, the design principles were revisited, analysed and reformulated based on the overall material. In this part of the analysis, all the material (photos, films, transcriptions and field-notes) was coded with open coding and discussed and qualified in the research group. This subsequent analytical process consisted of repeated iterative movements between individual play designs, play types and the empirical material across play types.

3.0 Theoretical framework

Definitions of play are often ambiguous, as Sutton-Smith (1997) has pointed out. While we may know what play feels like, it is nevertheless difficult to come up with clear definitions. The theoretical framework on play and participation in school from which we draw is based on the mood perspective (Skovbjerg, 2021), in which play activities are not regarded as a phenomenon confined solely to childhood. As Skovbjerg states, “play tells us something basic about what it is to be human, and games have taken place through all of history in all human societies. It is just something we do” (2021, p. 9). In connection with the mood perspective, a number of theoretical concepts have been developed which have been employed in our theoretical framework. The mood perspective gave us the opportunity to apply the theoretical concept of play to concrete actions for the pedagogues.

The mood perspective on play consists of a number of concepts. Below, we explain the concepts of play order, play practices and play moods. The first important concept is *play order*, which refers to the organizations of the actions, materials, relations and space used by participants in play. On one hand, play order is the prerequisite for play activity to happen at all; on the other, play order is constantly under construction (Skovbjerg & Sand, 2022).

The qualities of the play order in relation to materials, actions, space and relations were developed by applying the taxonomy of play types inspired by Hughes (2006). Hughes defines *creative play* as follows: “The essence of Creative play is in its drive to generate flexible combinations and permutations of shapes, textures, colours, sounds, tastes and/or smells” (2006, p. 38). Hughes identifies *role play* “... as an attempt at engagement in imitation of other people, through voice, mannerisms, dress and actions” (2006, p. 55). *Movement play* is a play type constructed as a combination of locomotor play and rough-and-tumble play. Hughes (2006) defines locomotor play as involving movement to a significant extent and emphasizes that children must use their own efforts to create movement for play to qualify as locomotor play. For instance, swinging can be locomotor play if the child is using his or her own effort to move through the air, but if someone else is pushing the swing, the child is not engaged in locomotor play. According to Hughes, rough-and-tumble play is close contact between children that involves non-aggressive “lunging, pouncing, biting, pushing, butting, grabbing, hitting, mounting and pinning” (2006, p. 47).

The actions in the different play types are a core design question; in the mood perspective, they are phrased as play practices, which are the actions that participants undertake in order to be involved in play order. It is through the play practices as actions that confirmation can take place. Lastly, if the play order as the organization of actions, materials, relations and space is confirmed and developed through practices of the participants in a meaningful way for them, they will experience play mood (Skovbjerg, 2021). In this understanding, play mood is the experience of play: lightness, the feeling of being together and a feeling of meaning (Sutton-Smith (1997).

Participation in play in light of the mood perspective is about getting a sense of what the play order is and taking part in the play practices so that order can be confirmed; to extend the discussion, it is about bringing in new ideas that are relevant for the play order and getting a sense of what others reinforce and bring in (Hansen et al., 2018; Jensen et al., 2022; Sand et al., 2022; Skovbjerg, 2021; Skovbjerg et al., 2022; Skovbjerg & Sand, 2022).

We wanted the design principles to give direction for the pedagogues when designing for play order and to be helpful for them to support participation in the sense of understanding participation in relation to play order, just as we wanted the principles to give guidance rather than to be instructive.

4.0 Results: Design principles – designing for participation in play

Below, we present our results, which consist of three separate analyses of three play types: creative play, role play and movement play. Each analysis consists of four sections that end in a design principle that emerges from how the project showed that it is possible to design for that specific play type. The results are presented by using examples from specific play experiments, but the design principles are constructed on the basis of all the empirical material on each play type.

4.1 Creative play

The first part of our analysis concerns the design principles in our first experiment on creative play. The pedagogues developed 12 creative play experiments and, in cooperation with the research team, developed the design through iterative processes. Most of the creative play experiments in the study were organized as play activities at a table where the children sat on their chairs most of the time. These play activities were characterized by few and relatively durable relations among the children placed next to one another (Jensen et al., 2022). In order to challenge the narrow understanding of how creative play could be organized and support the children in having different possibilities to participate, we designed a creative play experiment in the outdoor playground. We wanted to apply design principles so that the table was not at the centre of what the children shared in their play activity. The play design was called Quicksand.

“The two pedagogues, Peter and John, enthusiastically introduce today’s play to the two second graders. John begins: ‘Today we are going to play something called Quicksand.’ ‘Yeahhh!’ the children yell in unison. John continues: ‘Quicksand is when we go outside and play with water and sand and with dirt, string and sticks. We make caves, dig, build... whatever we want.... Do you remember that we talked about ore? A kind of metal. It may be that we can find some of it out there, but it may also be that there are other metals out there; I think copper, brass, I think stone.’ Peter adds, ‘maybe we’ll even find gold... ahh, that might just be too optimistic’” (Fieldnotes, 6 September 2019).

Quicksand is a new play design that nobody quite understands. The two pedagogues introduce a wide frame for play design that lacks rules or instructions. Instead, they emphasize free and joyful possibilities and feeding the children’s imagination. With imagination, they can create a world in which sand and stones can turn into iron ore and maybe even gold. At the heart of creative play, there is room for surprising and even crazy impulses, which also means that the play design is only a starting point; the game must also develop into other play types. That leads us to the first design principle: *Establish a play mood in which everything is possible.*

In the following play situation, the pedagogues create a space in which everything is possible.

“In the sandbox, five boys are standing around a hole and digging. They are passionately discovering larger and larger stones. As soon as they emerge, the stones are carried over to the water and washed. More kids are coming. A large flint stone is almost completely red and is called ‘the golden horn.’ It is worth saving. A large, round, white stone has appeared in the hole. One boy says it’s an egg. The boy next to him one-ups him by saying that it’s a dinosaur egg, and the next in line thinks that it’s a petrified dinosaur egg. They help each other and struggle for a long time with the stone before it finally comes up” (Fieldnotes, 13 September 2019).

Playing Quicksand is full of practices in which the children dig, wash and carry the materials and use their imagination. Touching, handling and doing different things with these materials is at the centre of the game, so there must be plenty of time to build, rebuild, experiment, practice and move into dead ends and out again. Through creative handling and imagination, the children develop the play order, which leads to the second design principle: *Support tinkering, investigation and experimentation.*

“A girl has found a flint stone and is showing it to John, one of the pedagogues, who says, ‘if we can find another flint stone, we can hit them against each other and make fire.’ A few moments later a group of children are walking around on the playground and hitting flint stones against one another. Small pieces fall off, and more children gather around the stones and look at them with interest” (Fieldnotes, 13 September 2019).

The children are busy working and struggling with the materials available on the playground. Heavy stones afford the children the chance to cooperate, and dirty stones beg to be washed. The sound, the smell and the flint stones falling apart when they collide – together with the idea of making fire – capture the children’s full attention. The materials contain a power (Taguchi, 2011) and affordance (Gibson, 1979) that pull the play activities in a certain direction (Sand et al., 2022). The third design principle of creative play is as follows: *Pay attention and be sensitive to a diversity of materials.*

In the case of Quicksand, the pedagogues have planned where to play, chosen the materials to be included in the game and offered an exciting introduction that strives to create a euphoric play mood (Skovbjerg, 2021). At the same time, they have decided not to regulate or otherwise direct the game. The pedagogues do feed the game, as when one suggests that they can hit the flint stones against each other, but most of the time the children are free to develop the play according to their own creativity and fantasies. On that basis, the last design principle for creative play is constructed as follows: *Create the framing and let go.*

We have illustrated above how four design principles were developed from the empirical material on creative play; we turn now to the analysis of role play.

4.2 Role play

In role play, children enact their interpretations of what it might be like to be other people. At one school, one of the pedagogues designed a version of the popular role-playing game *Dungeons & Dragons*. In this case, the design and experiments concern the organization and pedagogical considerations in relation to a well-known game. In the game, the seven participating children took on different challenges they faced in an imaginary world. From an objective point of view, the game is about whether children can solve challenges, but what really makes the game engaging is whether the children get to know their characters and act appropriately. When they manage to mix their real-life personalities and the game figure characteristics, the game really come alive. For example, one girl finds out that she can better help herself and the others fight some evil snowmen by healing one of the boys. She has a magical healing power, while the boy's magical power is a *burning hand* that can shoot balls of fire at the snowmen. The essence of this game is thus the children's ability to empathize with their roles in the fantasy universe they have built, and the first design principle on role play is as follows: *Support the children in creating and understanding a universe.*

The following excerpt from the fieldnotes illustrates what the children did with their bodies while playing *Dungeons & Dragons*.

“The game is on; the children are talking loudly, with eager voices. One of the boys says, ‘Next time I’ll use my burning hand.’ As he says this, he gestures, as if making a snowball in his hands and throwing it away with a quick flick of his wrist ... A girl says, ‘I’ll use my hand axe.’ There is a hiss through the room when the children say what magic they want to use, and the pedagogue supports this hiss with sounds on the computer and appreciative nods. The girl rolls the dice” (Fieldnotes, 22 November 2019).

The example shows how the practice of the game is for the children to animate their roles. When the children talk, change their voices, gesticulate and use their imagination, they draw on their knowledge and experiences from everyday life and game-specific knowledge, such as how to show that one has a *burning hand*. To truly be part of the game, they must perform certain imaginary practices. On the basis of that, we formulate the second role play design principle as follows: *Show and support the game's bodily practices.*

In addition to providing dice, paper and pens, the pedagogues have turned off the room lights and lit some candles; they play evocative music and show fantasy drawings on the computer. Different materials can help support a role and make it easier for a child to play a role and for others to understand it. In other role play activities, the children

used cups when they pretended to be at a café; one might need an ugly nose or a creepy voice if pretending to be a witch. The third role play design principle is thus as follows: *Provide props and costumes that can support the roles and help set the right mood.*

While playing, the children can try out different roles and attitudes; the pedagogue's task is to challenge and qualify the children's choices in order to offer a fair possibility for participation to all children.

"After many challenges, the children have finally jointly defeated a bunch of skeletons. They open a coffin and find a treasure with 100 gold pieces and some magic remedies. One of the oldest boys (third grade) picks up the gold and says that the other children can get five gold pieces each and that he will keep the rest. When nobody says anything, the pedagogue asks, 'Do you think that is fair? Aren't you risking that the other children will team up against you?' The boy ends up sharing the gold pieces equally (Fieldnotes, 22 November 2019).

In role play, children can choose how their characters should act and whether they would be helpful and collectively minded or egocentric and unfair. The pedagogue's task is to create a universe with different possibilities for participation so that the children can experiment and play with different roles suited to their temper and personality. The pedagogue can do this by participating in the game and taking a role, sitting on the edge of the game by being a gamemaster who determines the options in the game or by remaining outside the game and taking care of more practical issues. Against this background, the fourth role play design principle is: *Create options: participate in the game, sit on the edge of the game or remain outside the game.*

Having presented the four design principles on role play, we now move on to the design principles for movement play, the last play type.

4.3 Movement play

Two pedagogues at one school created a design for movement play called Nerf Gun War. The children were divided into two teams and were supposed to shoot each other with small foam darts fired from Nerf guns. The excerpt below is part of the introduction delivered by one pedagogue.

"'What happens if you are shot?' Boy: 'Then a doctor comes and touches one, and then you give your gun to the next one in line.' Pedagogue: 'Do you remember what happens if you get shot in the head?' A child answers, 'Then you die.' Pedagogue: 'That's right, then you die, so be careful not to stick your head out. It may well nibble a little if you get hit; it may well hurt a little. It's not something you cry about, but it might pinch, like a little half-hard smurf kick'" (Fieldnotes, 18 November 2020).

The game is about shooting one another; later, they also experiment with letting the two teams fight each other until one team is

conquered. But most of the time the children are vying in a non-competitive way. The essence of the game is not to get shot and the excitement about the almost insignificant pain if one does get shot. In the play order, it is about not getting hurt. In other designs for movement play, the essence was about mastering a specific skill or simply enjoying the joy of movement. On this basis, we define the first design principle for movement play as follows: *Create a mood where something is at stake, such as vying, mastery or joy of movement.*

“The war begins, the mood is high, the kids are smiling and laughing. They are tense and fast in their movements – up from hiding and shooting, and then quickly down again – repetition. The shots fly through the air and around the ears of the children. Puff, puff, puff. Charging grips are taken; the children crawl on the floor, move quickly, jump, navigate. Some lie down and play dead. The doctor comes by. The hand on the chest and count to 10. Hand on the gun, clear, free again” (Fieldnotes, 1 December 2020).

The playful war contains many practices and bodily actions which are more intense and powerful than in other school practices. One may become short of breath, start sweating and experience muscle aches due to many repetitions. There is often also less control, and the chaotic physical exertion can form a breeding ground for emotional fluctuations and excitement. This leads to the second design principle for movement play: *Create a place for fast, powerful, wild and chaotic play activities.*

Next to the Nerf guns and darts, the children wear safety goggles and move around in a battlefield constructed of large gym mattresses. Those materials are essential to the Nerf gun game, but what constitutes movement play in general across all movement play designs is the body and large spaces. The body is the primary and persistent material when it avoids, reacts and counterattacks. Large spaces – preferably outdoors – encourage the intensity and level of activity. Increased noise is almost an immanent part of movement play, and small breaks provide an opportunity to experience how movements feel in the body and in relation to one’s peers. The third design principle for movement play is as follows: *Use your whole body vigorously and be sensitive to bodily experiences.*

As part of the play design, there are doctors who can revive the fallen warriors. Asked who would like to be a doctor, a bunch of girls signed up.

“The doctors are busy. The girls’ hair and ponytails bounce up and down, showing that they are moving quickly. The doctors are popular, as they are also the ones who come up with new shots for the ‘warriors.’ One of the girls who used to be a doctor is now a warrior, and the pedagogue shows her how the gun works; she nods eagerly while he talks to her and looks around the room. Some of the other children take a short break after being shot” (Fieldnotes, 1 December 2020).

The intensity in movement play is physically and emotionally engaging and exciting, but it also runs the risk of being too much. Therefore, the pedagogue must be helpful in creating differentiated opportunities and include opportunities for breaks, where pulse rates can come down, emotions can be regulated, rules can be adjusted, and eliminated participants can be given a new chance at “life”. The last design principle for movement play is as follows: *Create more opportunities for participation and small breaks in the play activities.*

In the previous three sections, we have presented four design principles for each of the three play types, all aimed at designing inclusive play with different possibilities for participation.

5.0 Generic design principles

Inspired by the idea of DBR’s ambition to develop a theoretical understanding of a phenomenon, we have conducted a cross-play analysis to create guidelines for all sorts of play types. As Baumgartner and Bell (2002) have noted, design principles are successful if they contribute to the generation of new designs. Below, we present four generic design principles based on a cross-analysis of the above play types and discuss how pedagogues can contribute to creating different participatory possibilities in play activities.

The four generic design principles are 1) *the essence of play*, 2) *play practices*, 3) *play materials* and 4) *play opportunities for participation*.

The essence of play. The first design principle in each of the three play types is about the essence of the play. What is this game about? What is the meaning of the game? How does it make sense? Sometimes, the idea of the game is obvious, but at other times it is blurry and vague. For example, in Quicksand, it seems to become meaningful for the eight-year-old children to be in the sandbox because digging holes, washing stones and naming stones are part of a universe in which they can contribute to and experiment with creating stuff and stories. Playing *Dungeons & Dragons* is not only a question of solving challenges but also involves animating and empathetically understanding the characters. In *Dungeons & Dragons*, a wizard cannot do everything, just as there are certain conventions about a father’s role during mommy-and-daddy role play. In Nerf Gun War, the first thing the children were told is that the game is about two teams shooting at each other, but unease at, tension about or even anxiety about being shot are just as important. The essence of Nerf Gun War is that you shoot and risk getting shot at the same time. The essence of the play is about understanding what is thrilling, exciting, gripping and playful in the game. When designing for play, it is essential to be sensitive to what its essence is, and in order to design for participation and engagement in play order, it is crucial to ensure that the children know about that essence.

Play practices. All games consist of a number of practices, and to become an active part of the play order, one needs to perform certain actions. Very often, these practices are part of tacit knowledge, and

knowing them is potentially the key to achieving full membership in playing activity. A pedagogue must set aside enough time to create space for these practices and provide relevant skills and knowledge about them. When the boy playing *Dungeons & Dragons* makes the correct gesture to show that he has a *burning hand*, he is not adding to the objective progress in the game but contributes to the play community on a symbolic level. When playing Nerf Gun War, essence of the game can be dramatically expanded when players show that they have been shot and lie dead on the floor, with arms outstretched on each side, until the doctor comes by and revives them to return to the game. By being aware of these bodily practices, the pedagogue can participate and show new ways of acting, which can inspire the children to further developments in the game and explore further participatory possibilities.

Play materials. All games make use of materials, whether they be shovels, buckets, water, words, gestures or agile manoeuvres. We frequently observed that play materials could serve as unwanted gatekeepers for participating in the play order. To dig holes, you need enough shovels, and to play Nerf Gun War, you need an appropriate number of guns and darts. To take part in a game of *Dungeons & Dragons* requires certain skills like gestures and knowledge of game-specific concepts. Large materials require more cooperation and change the relationships between the children, and materials connote and encourage different games and appeal to different children; therefore, it may be a good idea to vary the use of materials. By directing attention and maintaining sensitivity to the materials, it is possible to look at them with new eyes and transcend everyday understandings of practice. The material acquired for participating in the play order is not necessarily a potential barrier but might also be a way to show that a play order is underway and attract new playmates to be involved in the play order.

Play opportunities for participation. All (basic) games develop during play activities and can take many shapes and colours; one play order can evolve into other play orders, depending on the participating children. A pedagogue can initiate, support, develop, help, include, shield and expand good play to create different opportunities and forms of participation in the play order. For example, a pedagogue can decide to bring more material into creative play so that more children can participate, or the pedagogue can help invent an extra part in role play to make sure every child has a role or suggest changes in a movement game that make it possible to re-join the play if one is shot.

6.0 Conclusion

The purpose of the project presented above was to develop play activities in a school setting in order to create different possibilities for children to participate in play. This has been investigated through a DBR methodology study that included several iterations of experiments using different play types. The study has scrutinized how design principles can be formulated to support pedagogues in developing new play

activities with great potential for participation. The paper presents analyses of design principles for three play types: creative play, role play and movement play. In each play type, four design principles were formulated, and the paper concludes by creating four generic design principles: the play essence, play practices, play materials and play opportunities for participation. The play experiments conducted in this study all seem to circle around these four generic principles, and we encourage other scholars to challenge and build on these four principles to test and qualify their significance. At the same time, we hope – and believe – that this study can inspire more practitioners and scholars to investigate how play and pedagogical practice can be developed through the use of design-based research and design principles.

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