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PLAYING AND MATHEMATICS: PERCEPTIONS OF CHILDREN FROM A PUBLIC SCHOOL

O BRINCAR E A MATEMÁTICA: PERCEÇÕES DE CRIANÇAS DE UMA ESCOLA PÚBLICA

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Abstract

The aim of this study is to explore the perspectives of Year 5 children from a state school in the municipality of Curitiba, Paraná, Brazil, on the connection between play and Mathematics. The research focuses on analysing drawings and photographs created by the children, which reflect their experiences in the classroom and their connection with mathematical concepts. The information obtained through observations, drawings, photographic records, and dialogues with the participants reveals that, although the children are able to associate mathematics with play and the respective spaces, their representations of ideal mathematics classes are still rooted in traditional practices, far removed from playfulness. This gap indicates the need for a more effective integration of play and mathematics teaching, aiming to make learning more meaningful and engaging for children.

Keywords: children's perceptions, play, mathematics, early grades

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Resumo

Este estudo qualitativo tem como objetivo explorar as perspetivas de crianças do 5.º ano do Ensino Fundamental de uma escola pública do município de Curitiba-Paraná, Brasil sobre a articulação entre o brincar e a Matemática. A pesquisa fundamenta-se na análise de desenhos e fotografias realizadas pelas crianças, que refletem suas experiências em sala de aula e sua conexão com conceitos matemáticos. As informações obtidas por meio de observações, desenhos, registros fotográficos e diálogos com as participantes revelam que, embora as crianças sejam capazes de associar a Matemática ao brincar e aos respectivos espaços, suas representações de aulas de Matemática ainda se baseiam em práticas tradicionais, distantes da ludicidade. Essa lacuna indica a necessidade de uma articulação mais eficaz entre o brincar e o ensino da Matemática, visando tornar o aprendizado mais significativo e engajador para as crianças.

Palavras-chave: percepções de crianças, brincar, matemática, primeiros anos

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Introduction

> Why is it that as the school segments advance, the spaces and times for play are reduced and children stop being children and become pupils? (Borba, 2007, p. 33).

By starting this article with this quote from Ângela Meyer Borba about the reduction of spaces and times for play as children progress through the different school segments, the intention is to make a reflection that instigates changes in the way the teaching and learning process is handled with primary school children, implying the loss of essential elements of childhood, such as play, especially in its relationship with maths. In the contemporary educational scenario, Mathematics Education has been searching for innovative and effective strategies that arouse children's interest and participation (Nacarato & Custódio, 2018; Muniz, 2016). In this context, play is highlighted in this text, especially in the early years of primary school.

According to Muniz (2016), there is a need for in-depth and well-founded discussion about the different meanings of the theoretical and practical relationships between play and learning maths in order to overcome limitations in integrating the play aspect with the subject. These limitations imply that games are used in two different situations: during the teaching process, as playful activities to motivate children, or after learning has been completed, as exercises to reinforce previously acquired knowledge.

In this direction, Spodek and Saracho (1998) explored the possibility of expanding this vision, considering that play can play a central role in the construction of mathematical knowledge, promoting learning that is more

meaningful and integrated into children's experience. Spodek and Saracho's (1998) proposal goes beyond the instrumental use of play, as it argues that play should be seen as an integral and continuous part of the teaching process, and not just as a complementary resource.

With this in mind, the aim of this text, which is part of a doctoral research project from the Postgraduate Programme in Science and Mathematics Education (PPGECM) at the Federal University of Paraná, is to explore the contribution of play and its relationship with mathematics, based on the perspectives of children in a 5th-grade class at a public school in the municipality of Curitiba, Paraná, Brazil.

From this perspective, it becomes essential to deepen the theoretical discussion that underpins the relationship between play and mathematics, aiming to understand how play can foster meaningful experiences for children. In this sense, the adopted theoretical framework seeks to support the analysis of children's perceptions regarding this practice, highlighting the role of play as an essential dimension for contextualized, creative, and engaging learning within the school context.

Theoretical Framework

Discussing play necessarily implies addressing conceptions of children and childhood, because play is a fundamental dimension of children's lives, intrinsic to their development, expression and construction of knowledge. It is an activity that involves the active subject and is directly related to their mental and emotional representations. Recognising the importance of play in childhood highlights experiences that respect and meet children's needs, enabling them to explore, experiment and develop fully.

Children have always been present in society in their various forms, existing in multiple realities and being seen in different ways throughout history, as Sarmento and Pinto (1997) point out. Childhood, as a social construction, was consolidated especially in the 17th and 18th centuries, when social representations, beliefs and socialisation and control devices emerged that established childhood as a social category of its own.

However, Sarmento and Pinto (1997) emphasise that, in contemporary conditions, a paradox persists in relation to the way children are considered by adult society. It can be seen that the smaller the presence of children in the population, the greater the value placed on them. This phenomenon, attributed to increased life expectancy and falling fertility rates, especially in Western contexts, highlights the centrality of childhood in today's society (Sarmento & Pinto, 1997).

The paradox with which children are viewed in the adult world also manifests itself in the school institution, as Sarmento and Pinto (1997) point out. Children are, on the one hand, encouraged to behave like children, but, paradoxically, their childish attitudes are often criticised. They are expected to play when they are

allowed to, but it is not understood why they don't stop playing when they are asked to. In the early years of primary school, this paradox intensifies, as children are encouraged to develop their cognitive, social and emotional skills in an exploratory and playful way. However, they simultaneously face pressure for academic performance and the expectation of behaviour closer to adult standards.

Historically, the perception of children has often confused them with 'mini-adults', being seen as reduced reproductions of adults, both in terms of dress and habits, as analysed by Ariès (1981). At other times, children were also seen as a form of entertainment, exhibiting behaviour seen as graceful for the amusement of adults, in a relationship that equated them with small domestic animals such as dogs, highlighting a view that oscillated between the playful and the instrumental.

However, according to the perspective of the Sociology of Childhood proposed by Sarmento and Pinto (1997), children are seen as full social actors, which recognises their ability to create symbolism and construct representations and beliefs within organised systems, in other words, in different cultures. With the intention of investigating the contribution of play and its connection to maths from the children's point of view, the following section will be supported by reflections based on assumptions from contemporary theories and studies.

To deepen the discussion, it is crucial to consider the tensions between children's perspectives and the organizational structures of schools. While play is valued as an essential dimension of child development, it faces limitations imposed by school norms and practices. In this context, the next section explores the challenges and possibilities of this intersection, highlighting how play, even amidst institutional constraints, can pave the way for more meaningful mathematical experiences that are connected to children's realities.

Conflicts and Possibilities: The Intersection of Play and Mathematics

The practice of play within institutionalised spaces faces challenges, given that educational institutions operate with established norms and set timetables. In addition, it is adults who shape the proposals and organise the environment, which does not always result in a correspondence between the children's intentions and desires and the opportunities offered by adults.

It can be seen that the transition to primary school follows the logic of pedagogical tradition. As emphasised by Borba (2007), there is a predominant perception that, on entering primary school, children should adopt a more serious attitude, focusing on attention and relegating play to second place. In this context, Gilles Brougère (2017) argues that play is learning in itself, and that children learn to play. This act is essentially social, as it allows the child to interact with others. During play, what is really learnt is the dynamics of play itself, which is extremely significant.

The link between play and maths has been a topic of debate and reflection in the educational field. Researchers and teachers recognise the importance of exploring the potential of play as an effective pedagogical approach to teaching mathematics. However, it can be seen that, for the early years of primary school, this possibility still lacks more in-depth exploration and realisation.

Play offers children a playful experience, and this experience must not be compromised by institutional dynamics when trying to introduce school learning into something that is intrinsically the children, as it is essential to respect and preserve the space for children's play. By imposing pedagogical objectives on play, there is a risk of corrupting its essence, transforming it into what Brougère (2017) calls a distortion that distorts play from its ludic nature.

The author analyses play as a cultural phenomenon and explores its relationship with the child. Brougère (2017) explains that play culture is linked to play schemes, which combine social observation, play habits and material resources. Children build their own play culture through participation in play, influenced by the material and social conditions that surround them. This playful construction is not limited to the social sphere, but can also be applied to the educational context, especially in learning maths.

From this perspective, Maths can overcome the notion of being abstract and distant, becoming an opportunity to explore, experiment and experience Maths in a meaningful way. By developing new learning and potential, children have the chance to broaden their horizons and their mathematical skills, strengthening their confidence and self-esteem in the process.

According to Nacarato and Custódio (2018), play associated with the process of teaching and learning mathematics represents a specific way of systematising the diverse knowledge that children acquire through their daily interactions with their peers, especially in the context of the adult world. In this sense, the authors emphasise that play plays a crucial role in the construction of knowledge, while at the same time offering an understanding of the society in which the child is inserted and its cultural relations. 'Children are movement, and as they play and move, they recreate and rethink the events around them, developing practices of respect for others, ethics, as well as cognitive and motor skills' (NACARATO & CUSTÓDIO, 2018, p. 30). The authors also emphasise that by taking part in play, children establish bonds, understand their limitations and face challenges.

Spodek and Saracho (1998) address the connection between play and the promotion of playful learning in maths teaching. The authors argue that dramatic play offers an enriching opportunity because, by simulating situations such as a shop, restaurant or market, children can practise skills such as counting, weighing goods and organising objects according to the number of customers, allowing them to explore concepts related to the monetary system (Spodek & Saracho, 1998). Play creates roles and social relationships (Nacarato & Custódio, 2018; Spodek & Saracho, 1998), which is important for children as it allows them to test hypotheses, express themselves, negotiate different social situations and learn to work with

their peers. Spodek and Saracho (1998) also mention motor play, which can take place both in open outdoor spaces and in classrooms.

To facilitate motor play, it is essential to provide materials such as ropes, balls, balance beams, sandboxes and hopscotch drawings on the floor. However, as pointed out by Muniz (2016) and Spodek and Saracho (1998), the role of the teacher is crucial, as they have the ability to guide children in improving their play, dedicating time and attention. Teachers can adapt outdoor activities according to local weather conditions.

It is important to emphasise that the presence of play in the school environment is not enough if it remains an exclusive activity for children, without the participation of teachers. For play to be truly enriching, the teacher must be actively involved in the experience, acting as a partner who plays together. In this way, they can provoke and explore new possibilities, ensuring that play retains its authenticity and continues to provide a space for creativity and genuine learning.

Play must be recognised as a creative expression of the child, and the teacher must be careful not to appropriate this practice in order to meet specific targets set by the curriculum. Otherwise, there is a risk of jeopardising the essence of play, distorting its true meaning.

It can therefore be seen that teacher training focused on the theme of play in maths teaching is fundamental to providing teachers with both the theoretical basis and the practices needed to guide children in exploring mathematical concepts through their play. In this way, teachers can facilitate discussions about play within the context of mathematical learning.

Differentiating Play and Games

To substantiate the feasibility of play in mathematics classes, particularly in the early years of primary education, it is essential to go beyond a superficial understanding that associates the use of games and playful activities with merely restoring enjoyment in school activities. The aim is to encourage the reader to perceive mathematical learning as an integral part of children's play.

It is important to highlight the need to differentiate the concepts of game and play, as the Portuguese language allows for this distinction in terms of meaning. According to Muniz (2016), there is considerable confusion caused by the indiscriminate use of the terms brincar (to play) and jogar (to game), along with the polysemy associated with these words. The authors assert that this lack of clarity often hinders an adequate understanding of the new and valuable opportunities to integrate games and playful activities into formal educational settings, especially in curricula.

In this perspective, Muniz (2016) clarifies that play is intrinsically linked to the pleasure that children experience while engaging in the activity. Children have the freedom to enter, exit, and modify the activity, including alterations to the rules. In

contrast, a game, as per Muniz (2016), operates with a set of predefined rules, where flexibility to change the rules and freedom to participate or leave are restricted. The Dutch historian and linguist Johan Huizinga emphasizes that rules play a fundamental role in defining a game, which is a space where civilization emerges and develops. Each game, with its specific rules, establishes what is considered valid within its temporary context. These rules are absolute and do not allow for discussion (Huizinga, 2000).

It is important to note that what is often called a game in the Mathematics classroom is not always truly playful for children, as it lacks essential elements that ensure the enjoyment of the activity. According to Muniz, the playful dimension does not lie in the people who create, develop, implement, and control the activity, but rather in the perspective of the player themselves, that is, in the view of the child or young person experiencing the activity (Muniz, 2016).

After defining the distinctions between playing and playing, the text proceeds to describe the methodology employed in the study, elucidating the selected methods to investigate the contribution of play and its relationship with Mathematics from the perspectives of children in a fifth-grade class at a public school.

Methodology

The methodological approach of this research was guided by principles of the qualitative approach, which, according to Garnica (2010), acknowledges the dynamic and provisional nature of results, rejects the formulation of prior hypotheses, and recognizes the researcher's influence in the interpretive process. In this context, the researcher, while interpreting the data, inevitably incorporates their perspectives and prior experiences. Furthermore, it is understood that the process of constructing understandings is not fixed but continuous and subject to constant reformulation. Finally, it is acknowledged that systematic procedures cannot be rigidly regulated due to the inherent complexity and flexibility of the qualitative approach.

In the Brazilian context, there has been an effort to consolidate a view of the child as a citizen, a creative subject, a social individual, and a producer of culture and history (Kramer, 2002). In this sense, the present research aimed to explore children's perspectives on the theme of play and its relationship with Mathematics, selecting approaches and instruments that would allow for the gathering of information and capture the various forms of children's expression. The investigation, therefore, utilized a variety of methods to understand children's perspectives on play and its connection to Mathematics teaching. The chosen methods allowed access to the children's perceptions through written, visual, and verbal records, addressing the complexity of the object of study.

The investigation, therefore, employed a variety of methods to understand children's perspectives on play and its connection with Mathematics teaching. The

instruments were selected based on their ability to capture the multiplicity of forms of children's expression, as suggested by Zabalza (2004), Flores (2015), and Gaskell (2004). Participant observations were conducted and documented in a field diary, focusing on the use of space, pedagogical planning, and the interactions between children and the teacher during Mathematics lessons. The children also created drawings to represent what they consider an engaging Mathematics experience.

Photographic records were instrumental in identifying the relationship between Mathematics and play within the school environment. Group interviews were conducted to gather more detailed insights from the children about the constructed information. The choice of multiple research instruments, such as the field diary (Zabalza, 2004), drawings and photographs (Flores, 2015), and group interviews (Gaskell, 2004), aimed to encompass various forms of children's expression and capture the complexity of their experiences.

The selected instruments interacted with each other, fostering a triangulated approach where the information obtained complemented one another. Observations provided context for the children's interactions within the school environment; drawings and photographs highlighted their visual and narrative perceptions; and interviews deepened these perceptions through collective reflections and discussions.

Field of research

The choice of research site took into account aspects that would enable an in-depth analysis of the subject and the achievement of the objectives, always with an ethical commitment. It was therefore decided to choose a class in the early years of primary school in a public school, ensuring that the external researcher would be well received, without giving preference to teachers who already valued play in maths lessons. Initial contact was made with professionals from public schools in Curitiba. A teacher trainer, who worked in teacher training between 2018 and 2020 and returned to the classroom in 2021, agreed to carry out the research in her 5th grade class at the school where she teaches, located in the Tatuquara neighbourhood. The choice of this teacher also took into account her experience with diverse pedagogical practices, which contributed to the richness of the collected data.

Observing the Curitiba Municipal School, where the research was carried out, initially drew attention to its location on one of the main avenues in the Tatuquara neighbourhood. Nearby there is a Children's Education Centre, a Family Store, a church of the Christian Congregation in Brazil and other commercial establishments. The school has a large outdoor area, a spacious gymnasium and gates that delimit the educational environment.

Children who participated in the research

At the Curitiba Municipal School, a 5th grade class was selected for the research, involving 32 children. Although the proposed activities were carried out with the whole class to avoid embarrassment, 24 children provided the necessary authorisations to take part. The criterion for selecting the class was to ensure a diversity of perceptions and experiences representative of the public-school context in Curitiba.

Weaving the information: drawings, photographs and interviews

Twelve visits were made during the field research in 2022. Six visits were dedicated to activities with the children, such as making drawings, photographs and interviews. One day was set aside for a conversation with the school's management team and a presentation of the research, inviting the children to take part. Four days were spent observing the 5th grade class and one day was dedicated to giving feedback on the first stage of the research. The class teacher supported this approach, as the children showed curiosity and shared their doubts with their families .

The participant observations were guided by pre-defined categories, such as interactions between children and the teacher, use of school spaces, and pedagogical practices related to Mathematics. These records, detailed in the field diary, were later analysed to identify patterns and emerging aspects.

During the interactions, the children asked questions about costs and additional materials. After the research presentation, classroom observations were carried out and recorded in the field diary. During the visits to the school, the children played the Dixit game to raise awareness and contemplate the images. The Dixit game, launched in 2008, provides an experience of reading and interpreting the cards, allowing reflection on the objects represented. The Dixit game was used to familiarise the children, and in subsequent interviews, the game cards were extended to include children's drawings and photographs, promoting dialogue and reflection during the group interviews.

During the field research, the field diary was used to record observations. On the first day, the teacher invited two children to introduce the school and accompany her during recess. She chose to record her observations when she returned from the field, focussing on the most striking aspects. When something caught her eye, she recorded it immediately. The diary included sounds, perceptions and emotions from the observations and the journey to the field, documenting the researcher's impressions and reflections.

Before the drawings were made, the children were sensitised to works of art by Candido Portinari, Edgar Degas and Pablo Picasso. After the awareness-raising, the children took part in an activity to answer what is needed for a good maths lesson, proposed by means of a story adapted from Cruz (2008). The story served to engage the children and arouse their curiosity, encouraging them to reflect on the important elements for an interesting and fruitful lesson. The aim was to create a

relaxed and stimulating environment where the children could express their ideas freely, promoting an open dialogue about their perceptions of maths lessons.

The children had two lessons to draw their pictures individually, ensuring time and calm. Everyone took part, but only the drawings of the authorised children were used in the research. On another visit, there was a moment of sensitisation with photographs by Henri Cartier-Bresson to discuss framing. The children, organised in pairs, talked about what to record and made their photographic records.

Digital cameras and written records were distributed so that the children could write captions for the photos, answering two questions: 'What do you most like to do at school?' and 'Where is maths for you?'. The children were free to choose which areas of the school they wanted to photograph, and the staff were informed about the movement.

After the drawing and photography activities, interviews were organised with the participating children. Drawings, photographs and the Dixit game were used to stimulate ideas and discussions. The interviews took place in the library, with the children arranged around a round table. Only children with authorisation took part, and a voice recorder was used. The children were organised into small groups to discuss the information obtained from the research. The Dixit game was used to animate the debate, using the children's drawings and photographs as extension cards. Seven groups were formed, ranging from two to four children per group, depending on their presence on the days of the interviews.

One of the ethical processes of the research is feedback, where different materials are planned to present the results to the participants, such as the children and the school management. In December 2022, a meeting was proposed with the 5th grade class to present some preliminary results from the first stage of the research. The meeting began with a discussion about research involving children, using the books 'Childhood in the eyes of the child' and 'The house of stars'. The children had access to these books and to an exhibition of drawings and photographs, suggested by some of the children in the class. There was also a feedback session for the school management, with a talk and presentation of the information constructed by the children.

The triangulation of information obtained through drawings, photographs, and interviews enabled a rich and integrated analysis, connecting the multiple dimensions of children's experiences with play and Mathematics.

Results and discussion

In this context, an analysis was carried out based on Gaskell (2004), who explains that the aim of analysis is to seek meaning and understanding. Considering that what is said constitutes the information, but that analysis goes beyond accepting the apparent value. For the author, analysis seeks to identify themes with

common content. Essentially, the author agrees that the moment of analysis and interpretation requires time and effort, which implies the researcher's own immersion in the corpus of the text. As Gaskell (2004) recommends, the interviews were fully transcribed, marked up, annotated, concordance identified in the context of the words, as well as thematically analysed.

The analysis of the drawings was inspired by the construction of the affective map, according to Bomfim (2010) and Röder (2018), considering the structure of the drawing, which describes the image observed; the interpretation, which reveals what the creator intended to represent; the meaning, which exposes the sense attributed by the subject to their drawing, providing an understanding of the perception of play in maths lessons; the quality, related to the attributes that connect play to maths lessons; and the sense, the interpretation made by the researcher based on the metaphors present, without imposing external meanings on the teachers' representations.

To help analyse the visual materials, the work was also based on Loizos (2004), who is concerned with the use of photographs as qualitative research methods. For the author, the image is a potential record of temporal actions and real events. Loizos (2004) considers that photography can serve as a trigger to evoke memories of people that an interview would not be able to address. Thus, images can facilitate the construction and sharing of information, allowing the researcher and interviewee to discuss in a more relaxed manner than without a visual stimulus (LOIZOS, 2004, p. 143).

The empirical data reveal that children perceive play as an opportunity for movement, social interaction, and discovery. These characteristics align with the literature advocating for the integration of playful practices into Mathematics education, as highlighted by Borba (2007) and Nacarato and Custódio (2018). These authors emphasize that Mathematics, when experienced in meaningful contexts, can become a field of active and engaging exploration, contrasting with exclusively traditional approaches.

Children's Perceptions: Connections with Everyday Life

It is emphasized that, in total, the research listened to 7 groups, composed of five children during the group interviews; however, since this text refers to a specific subset of the research, only the information gathered from the first group, which participated in the proposed activities and had the recordings transcribed and analyzed, is considered for the present analysis.

The photographic records from the children in the first group revealed interesting choices regarding the school spaces. Places such as the playground and the sports court were selected to represent the areas they liked the most within the institution, symbolizing environments of movement and relaxation, where play frequently occurs. The choice of these spaces, where children can be more connected, aligns with the literature that emphasizes the importance of considering

school environments to enhance learning. Authors such as Borba (2007) and Nacarato and Custódio (2018) discuss the relevance of exploring Mathematics and play outside the classroom, as this way, children have the opportunity to play and explore Mathematics in a contextualized manner.

The present research investigated children's perceptions of the relationship between play and Mathematics, revealing that children associate the subject with spaces for movement and relaxation, such as the sports court. These environments, where they feel more at ease, are fundamental for building meaningful and contextualized experiences in Mathematics. This choice by the children aligns with studies that emphasize the importance of environments that promote interaction and playful exploration.

The information obtained indicates that children not only recognize Mathematics in formal contexts but also experience it in their daily activities. The identification of mathematical elements in play, such as quantifying and measuring distances on the court, demonstrates that Mathematics is perceived as an integral part of their daily experiences. This perspective is supported by Nacarato and Custódio (2018), who argue that play, in the teaching and learning process, represents an effective way to relate the knowledge constructed by children in their social interactions. However, the research also revealed a difficulty among the children in identifying places in the school where Mathematics is present, as recorded in the field diary.

> Today, while observing the photography activity, I realised that the groups had difficulties identifying places in the school that could be related to mathematics. As they walked along the corridors, they questioned each other, trying to find connections. 'Is there maths here?' one asked, while another analysed the surrounding space, looking for references. The interaction between them was rich, but the hesitancy to recognise mathematics in everyday environments was evident. (Field Diary, 12/11/2022)

This gap underscores the need for teaching approaches that value experiences with play, as proposed by Muniz (2016). The photographs and captured dialogues highlight the importance of activities that connect Mathematics to children's daily lives, particularly in playful environments. The lack of such connections may lead to a distorted perception of Mathematics, which remains tied to traditional practices and detached from the essence of play.

The analysis of the information obtained not only reflects the theories discussed but also highlights the need for pedagogical practices that integrate play as a means of meaningful learning in Mathematics. Promoting experiences that connect Mathematics to children's daily lives, especially in playful environments, can contribute to how they perceive and relate to the subject, making it more meaningful and accessible.

The conversation between Kauane and Júlia about the playground as the place they like most at school reveals not only their preference for a playful space but also how they associate this environment with play and exploration. The fact that Kauane and Júlia identify the playground as a significant location for play can be interpreted as a direct link between the enjoyment of the activity and the construction of knowledge, suggesting that Mathematics can be perceived more lightly when integrated into familiar and enjoyable contexts.

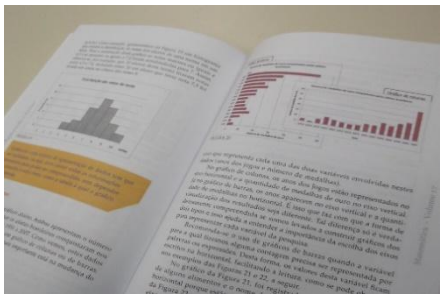
The empirical data reveal that children identify play as an opportunity for movement, social interaction, and discovery. These characteristics resonate with the literature advocating for the integration of playful practices into Mathematics teaching, as highlighted by Borba (2007) and Nacarato and Custódio (2018). These authors emphasize that Mathematics, when experienced in meaningful contexts, can become a field of active and engaging exploration, in contrast to exclusively traditional approaches.

The interaction with Lucas and Thauane highlights their perception of Mathematics in physical activities, particularly on the sports court. Their association of the court with games like football and basketball demonstrates their ability to recognise mathematical concepts, such as counting and measuring, in real-life contexts. This underscores the importance of incorporating these spaces into pedagogical practices, allowing students to experience Mathematics as connected to their daily lives rather than just theoretical concepts. This approach fosters a broader understanding of Mathematics among children. Photographs taken by the children can be found in Table 1 below.

Table 1

Photographs as Extension Cards of the 1st Group of Children

PHOTOGRAPH	DESCRIPTION OF THE AUTHORS

	Researcher: Kauane and Júlia, the first photograph was about the place you like the most at school. Would you like to talk about that place? Kauane: It's our favorite place in school. Researcher: What is the place? Júlia: The playground. Kauane: There are lots of things to do there. Researcher: The school has two playgrounds, right? Júlia: Yes. Kauane: There are two sandy playgrounds, and one has a swing. Júlia: The swing. Kauane: Over there, you can see. Júlia: The swing. Júlia: From that part, you can see the playground. Researcher: I see. What do you like to do at the playground in the photograph? Kauane: Play on the. Júlia: Play mom height. Kauane: Mom height and slide down the slides.
	Researcher: And what about the second photograph? Kauane: That's our only option, right? Júlia: Yeah, we walked around the whole school and didn't find anything else. Researcher: So, you found a book? Júlia: Yes. Researcher: Why did you decide to take a picture of the book? Kauane: Because it had something to do with Mathematics.Researcher: Is this a Mathematics book? Júlia: Yes. Kauane: Yes. It was a book that was right here on the table (library table).
	Researcher: Where is this place? Lucas: The court. Thauane: The court. Researcher: What do you like to do there? Lucas: Play football and play basketball. Thauane: I like to play basketball.

	Researcher: The second photograph was about a place where you think there is Mathematics. Which place did you think of? Lucas: The court.

Source: Field research (2022).

This relationship between play and Mathematics suggests the need for teaching that values these experiences, promoting a contextualized approach that stimulates children's experience and curiosity about mathematical concepts. It is interesting to highlight that the interaction between Kauane and Júlia, where they mention 'our only option, right?' and 'we went around the whole school and didn't find it,' reveals a limitation in children's perception of where Mathematics manifests itself.

When asked about the photograph of a book, Júlia's response, 'because it had Mathematics stuff,' indicates that their association with Mathematics is strongly tied to educational materials and the classroom rather than interactive and playful spaces at school. This situation suggests that although children recognize Mathematics as an important subject, they struggle to see it integrated into their daily experiences and play environments.

This limitation may be attributed to the way Mathematics is traditionally taught, often disconnected from practical experiences and spaces of social interaction. However, Mathematics should be integrated into children's daily experiences (Muniz, 2016).

Therefore, it is essential for teachers to promote pedagogical approaches that help children establish connections between Mathematics and play in various school settings, encouraging a broader and more contextualized view of the subject. Promoting activities that integrate play and Mathematics can facilitate this relationship, allowing children to recognize the presence of Mathematics in their everyday experiences, not just in books, but also in spaces of movement and social interaction.

Children's Perceptions: Experiential Representations of Mathematics Classes

The analysis presented reflects a common reality in Mathematics classes, where the traditional teaching structure predominates, limiting the exploration of play's potential that could enrich children's relationship with Mathematics. The observation that lessons were pre-planned and organized without the inclusion of manipulatives suggests a pedagogical approach that may not meet children's

learning needs, as discussed by Muniz (2016) and Brougère (2017). The lack of manipulatives can restrict children's ability to experience Mathematics meaningfully, which is essential for building mathematical concepts.

Field diary entries and analysis of drawings were valuable tools in understanding how children perceive and relate to Mathematics. Through their drawings, children express their experiences and preferences, revealing that their classroom experiences are strongly tied to traditional teaching methods that often do not value play as a pedagogical strategy. This aligns with the critique by Spodek and Saracho (1998), who argue that play should be seen as an integral part of the learning process, not just as a complementary activity.

In this sense, the finding that children draw on references from their classroom experiences when illustrating what they consider to be a fun and interesting Mathematics class suggests that, even while recognizing the value of play, their experiences are still deeply rooted in conventional approaches. This situation indicates a need to rethink pedagogical practice, where play and Mathematics can coexist harmoniously, allowing children to develop an integrated understanding of Mathematics in their daily lives.

Therefore, the analysis suggests that for Mathematics to become a more meaningful and playful experience, pedagogical practices must be reassessed and adapted, incorporating play as a central strategy in the teaching-learning process, as advocated by Nacarato and Custódio (2018).

Following this, the children's drawings, created individually over two classes, will be presented. These drawings were used as a response to the question of what would constitute a fun and interesting Mathematics class. In the context of the research, children were invited to help the city's mayor reflect on what this ideal class could look like, providing an opportunity for them to express their ideas and perceptions of Mathematics teaching in a creative and engaging way.

The analysis of the children's drawings deserves an interesting observation: when invited to imagine an ideal Mathematics class, they ended up reflecting their experiences in conventional classes, which, as observed, were predominantly traditional and did not incorporate play, games, or manipulatives. This finding is significant as it shows that, even with creative freedom, children based their drawings on their school experiences, which often lack playful approaches and experiences.

For example, Kauane drew squares of chocolate, highlighting the importance of concrete and sensory materials in learning. Her mention of a notebook and scissors suggests a perception that Mathematics goes beyond numbers, involving the handling of objects, which may indicate a broader view of the mathematical experience.

Júlia, on the other hand, associated her fractions class with the pleasure of using chocolate and the satisfaction of eating after the activity. Her drawing not only represents curricular content but also emphasizes the positive and memorable

nature that practical activities can have in learning. Her choice of this class as 'really cool' reinforces the idea that practices linked to play can facilitate the understanding of abstract concepts.

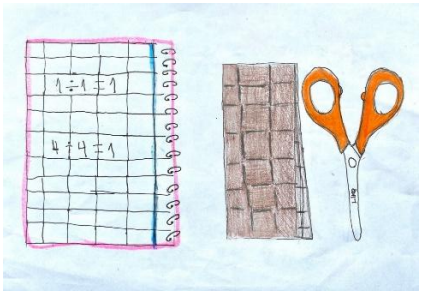
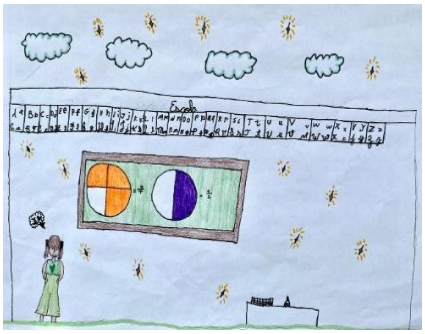
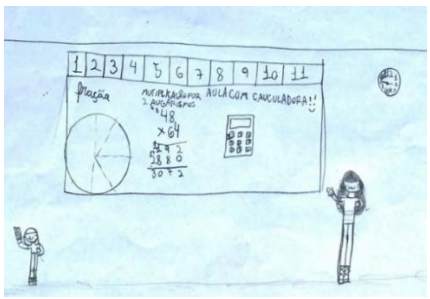
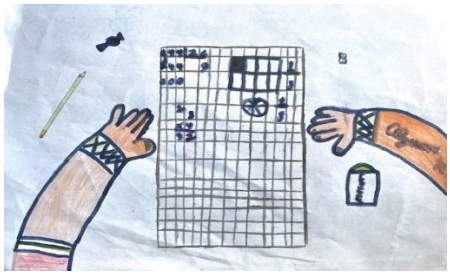
In contrast, Thauane presented a more traditional representation of Mathematics, including fractions, multiplication, and a calculator. This suggests that, for her, Mathematics is closely linked to the teacher's role as the central figure in the teaching process.

Lucas expressed a more spontaneous and free approach, without a clear connection to a specific experience. This may indicate that, for some children, Mathematics can be represented more intuitively, not necessarily tied to a formal classroom context. His phrase, 'I don't know, it just came to my mind,' reflects a more fluid perception of the subject, allowing us to consider the various ways children express their mathematical experiences.

The children's drawings can be observed in Table 2 below.

Table 2

Drawings and Dialogues of Children About Mathematics Lessons

DRAW	DESCRIPTION OF THE AUTHORS
	Kauane: Chocolate, because we can count the squares, and we've also had a class with chocolate. Researcher: Did you draw a notebook as well? Kauane: Because I also saw Mathematics in it. Researcher: And the scissors? Kauane: To cut paper. Researcher: Do you also use that in Maths class? Kauane: Sometimes. Thauane: Kauane, do you remember you took my scissors? Kauane: Yes (laughs).
	Júlia: I drew teacher Heloiza teaching us how to make fractions, and it was from that lesson we had with chocolate. Researcher: Why did you choose this lesson? Júlia: Because it was really fun; after we finished, we ate it. (laughs).
	Thauane: A good teacher giving a lesson. I drew fractions, multiplication with two digits, and a calculator. Researcher: And who are these two people? Thauane: The teacher and a student. Researcher: Is that you? Thauane: No.
	Lucas: I don't know, it just came to my mind.

Source: Field research (2022).

These drawings reveal how play and experiences with Mathematics impact children's perceptions and representations. Although they recognize play as part of their experiences, their relationships with Mathematics remain strongly tied to traditional approaches. The classroom continues to be the most represented space when referring to Mathematics.

Therefore, this analysis highlights the need for a pedagogy that values experiences with play, promoting a more dynamic and interactive learning environment. This can engage children and facilitate the construction of mathematical knowledge, as suggested by authors like Nacarato and Custódio (2018) and Brougère (2017). Mathematics education should, thus, seek to integrate play, recognizing the child as an active subject in the knowledge construction process, as discussed by Kramer (2002).

For Mathematics to be understood in a broader and more meaningful way, it is essential for teachers to promote approaches that integrate play into the construction of mathematical concepts, valuing social interactions and everyday contexts as spaces for teaching and learning.

Conclusions

The research aimed to explore the perspectives of fifth-year children from a public school in the municipality of Curitiba, Paraná, Brazil, regarding the connection between play and Mathematics, highlighting the importance of integrating playful experiences into the teaching of this subject. The methodology adopted involved a qualitative approach, which included conducting interviews, observations, and analysing drawings and photographs produced by the children. These strategies allowed for capturing the diverse forms of expression and experiences of the children in relation to Mathematics, revealing how their everyday experiences influence the way they engage with the topic addressed.

The results indicated that although children recognize the value of play as part of the school environment, their experiences with Mathematics are still strongly tied to traditional teaching approaches. The representations made by the children, especially in their drawings, reflect their conventional classes, suggesting that the use of manipulatives and practical activities can facilitate the understanding of mathematical concepts. This finding reinforces the need for teachers to adopt methodologies that consider children's experiences, promoting a more dynamic and interactive learning environment. For expanding understandings of mathematical concepts and their connection with everyday life.

Moreover, the study highlights that when play is integrated into pedagogical practices, it can not only enhance children's engagement but also foster a more positive relationship with Mathematics, expanding the opportunity for them to reframe their experiences with the subject.

In light of the above, the research highlights the relevance of a pedagogical approach that values play as a central element in the teaching and learning process of Mathematics. In this sense, promoting pedagogical practices that incorporate play requires teacher training focused on recognizing and valuing children's experiences, as well as a critical reflection on the traditional curriculum.

By integrating play into the curriculum, it is possible not only to make lessons more engaging but also to contribute to the development of children's confidence and self-esteem in relation to Mathematics. Thus, the creation of a playful culture within the school environment, as discussed by authors such as Brougère (2017) and Nacarato and Custódio (2018), can be a promising path to transforming children's perceptions of Mathematics, making it a meaningful and enjoyable experience. This transformation requires not only a rethinking of teacher education but also the involvement of school management and the community, so that play is recognized as an integral part of meaningful Mathematics education.

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