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Designing Inclusive Playgrounds - Views of Architects - Civil Engineers, General and Special Education Teachers

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Abstract

Play and its benefits are recognised not only by the scientific literature, but also by international conventions as a right of all children, without discrimination, to which all UN member countries are signatories. The 2006 Convention on the Rights of Persons with Disabilities explicitly protects the participation and equal access of children with disabilities, together with their peers, in recreational, leisure and sporting activities. An inclusive play space is one that does not impede accessibility (physical, sensory, communicative and cognitive), providing a stimulating environment for all children and play experiences based on their preferences and motivations. In the context of the above, the purpose of this research is to explore the views of outdoor playground designers (civil engineers-architects) and general and special education teachers on the design of inclusive playgrounds. A questionnaire was used as a research tool, which included questions about the participants' biographical information, the investigation of the suitability and accessibility of existing playgrounds for people with disabilities, the investigation of the need to design inclusive playgrounds and the basic criteria they must meet. The sample consisted of 110 civil engineers-architects and general and special education teachers working in an urban area. The results of the survey can be used in the design of outdoor inclusive play areas in order to remove the barriers that make it impossible for all children to participate in play without discrimination.

Keywords: outdoor play, playgrounds, designing, inclusion

1. Introduction

Play is a fundamental right of childhood and has a significant impact on a child's well-being and development. Children's environments shape opportunities for play engagement which further affects their physical health, social skills and emotional well-being (Lee et al., 2021). However, research has shown that children with disabilities experience exclusion in their access and participation in public playgrounds and consequently are less likely to obtain the above benefits (Lynch, Moore, Edwards & Horgan, 2020). Children with disabilities face environmental barriers in playgrounds that are mainly found in inappropriate equipment, insufficient play options and minimal opportunities for social interaction (Moore, Lynch & Boyle, 2022). These barriers prevent the full participation of children with disabilities in play and in society. Creating attractive and inclusive environments that support and facilitate the participation of all children without exception is very important to extend the full benefits of play to all children (Spencer-Cavaliere & Watkinson, 2010; Unicef, 2021). Playground design has been researched in relation to promoting active play, however there is a lack of research on design that enhances the inclusion of children with disabilities in the outdoor environment and outdoor play spaces. Based on the above data, this paper attempts an investigation of the opinions of outdoor playground designers (architects and civil engineers) in combination with the opinions of general and special education teachers regarding the necessity of designing inclusive playgrounds. In the theoretical part, a reference is made to the child-toy relationship, the benefits of the participation of all children in outdoor play spaces are emphasized and the obstacles faced by children with disabilities in their attempt to access and participate in play are analyzed. The research part presents the research methodology (purpose, research questions, research tool, sample, interpretation and analysis of the data) and the statistical analysis. The research closes with the conclusions derived from it, the discussion as well as the proposals for further research works.

2. Importance and Benefits of Outdoor Play

Outdoor play areas, such as playgrounds, satisfy children's independent action, promote many forms of movement and play, while at the same time they are meeting places between children and their parents (Konstantinopoulos, 2007). The playground environment offers children a great deal of freedom to interact, usually with minimal involvement and supervision from adults, as well as opportunities to create, organize and control play experiences. This helps children not only to practice social skills but also to make decisions that will be needed later in life (Hart, 1993). For playground scholars, an ideal space for children is considered one that does not offer ready-made ideas to children but that respects their opinions, expectations, feelings and experiences (Hart, 1979; Rasmussen, 2004; Skivenes & Strandbu, 2006; Bento & Dias, 2017). A space that as a field of free action provides children with qualitative and quantitative opportunities for exploration and experimentation as well as a field of freedom to try and invent new things with the help of the material elements of nature and natural surfaces. Children play more independently while the play activities they develop are more creative and encourage the development of language and cooperative skills as well as imagination, information recall, successful and creative problem solving and a sense of restlessness that

motivates further learning (White & Stoecklin, 1998).

2.1 Playgrounds in the City

Modern approaches to play in organized public playgrounds refer to the playground as a place for motor exercise and social contact as well as a place for the formation of children's social identity (Pitsikali & Parnell, 2019). But often the instruments of a playground have repeated and standardized form that orients to specific types of play, mainly kinetic form. Their uniformity and the limitation of children's self-activity makes the game less attractive (Kontopoulou, 2015). The most modern conceptions of the formation of play spaces for children are based on criteria of aesthetic excellence and include constructions that expand the variety of activities (e.g. adventure playgrounds, see Botsoglou, 2010). Since the 1980s playground safety has emerged as an important issue as children spend considerable time there. Thus, hard surfaces are gradually replaced with others suitable for children, the height of cribs and other instruments is lowered, while tools and instruments are withdrawn as they are considered dangerous. The play areas are the only ones typically intended for children, they are functionally and morphologically delimited and surround their action in an environment of suffocating, many times, "safety" where they try to fit their experiences and actions. Greek playgrounds show a surprising uniformity regarding their organization and the play structures that equip them. Current legislation and the image of a safe playground with certified and tested materials and instruments leads to a common model that we see all over Greece.

2.2 The Access of Children with Disabilities to Outdoor Play Areas

According to Hicks and Heseltine (Botsoglou, 2010) the term "access" refers to an element or an area of the outdoor play space that can be used, either completely or partially, by all individuals and therefore by persons with disabilities. Outdoor play offers all children the opportunity to gain a variety of experiences. However, outdoor play can be problematic for children with disabilities as outdoor play areas can be unwelcoming. With the right design and equipment we can create outdoor spaces that promote enjoyment and fun for all children, inclusive. Universal Design, an architectural movement that focuses on the design of products and environments that are usable by all including people with disabilities, identifies the basic design principles of outdoor play spaces that relate to a) the equitable use of spaces by people with different abilities, without stigmatizing users but offering safety and protection, b) in flexibility, but also in simple and intuitive use so that the use of the design is easily understood by the user, c) in providing comprehensible usage information regardless of environmental conditions or the user's sensory abilities, d) fault tolerance as the design minimizes the risks of accidental or intentional actions, e) low physical effort, and f) appropriate size and space for approach and use regardless of body size of the user or his mobility (Politi & Botsoglou, 2018). According to the United Nations Convention on the Rights of the Child with Disabilities (2006), play is central to the daily life of all children and children with disabilities have this right recognized and protected so that they enjoy equality of access and opportunity game. A child's disability does not diminish his energy or take away his innate sense of adventure. Unfortunately, the needs, interests and rights of children with disabilities, especially those related to children's equal access to play opportunities, continue to be omitted from the design

of outdoor play spaces (Ross, Arbour-Nicitopoulos, Kanicks & Leo, 2022).

2.3 Barriers to the Design Process of Inclusive Outdoor Play Spaces

Outdoor spaces mean for children an opportunity for movement, freedom and play. As important as outdoor play is for typically developing children, it is perhaps even more so for children with disabilities. Therefore the goal of outdoor playground designers should be to offer challenges for all and obstacles for none. Unfortunately in the context of outdoor play areas, accessibility is only limited to the addition of a bar and usually objects and equipment cannot be used by children with disabilities either in whole or in part. This exclusion from the use of instruments and materials also limits the possibility of the disabled child's participation in activities, communication with other children and their social integration. Greater importance should therefore be given to the study and design of accessible inclusive play spaces that do not hinder accessibility (physical, sensory, communicative and cognitive). This inclusive playground is based on three concepts: Universal Design, Equity and Inclusion, and is developed through three realities: the presence, participation and meaningful experience of all students regardless of age, background, experiences and their personal situation (Fernández-Lagar, 2021). Obstacles to inclusive play are considered to be anything that prevents or makes impossible the participation of all students in the game. Obstacles may exist in the physical environment, in the activities or may be related to the people involved in the play area and concern: a) physical obstacles that make it difficult for children with disabilities to move around the area or the play materials b) obstacles related to the senses, as well as the characteristics of the environment c) obstacles concerning the communication of children with each other and with adults, especially when children with difficulty seeing or hearing are involved. d) cognitive barriers, which concern understanding the purpose or rules of a game e) barriers related to the attitudes of children and adults as well as their knowledge of inclusion (Fernández-Lagar, 2021).

2.4 Literature Review

Playground design has been researched in relation to promoting active play, however there is a lack of research on design that enhances the inclusion of children with disabilities in the outdoor environment and outdoor play spaces. At the same time, the design for children with disabilities and social isolation in playgrounds has been studied individually, as well as the recognition of personal as well as environmental barriers to social participation in play for children with disabilities (Fernelious & Christensen, 2017; Brown, Ross, Leo, Buliung, Shirazipour, Latimer-Cheung, & Arbour-Nicitopoulos, 2021; Mor, 2023; Taylor, Primucci, Vanderloo, Arbour-Nicitopoulos, Leo, Gilliland, & Tucker, 2023). The views of children and their families as well as special educators of children with disabilities regarding children's access and participation in playgrounds and the design of the ideal playground open to all children are presented by various studies (Stanton- Chapman & Schmidt, 2017; Ristianti & Widjajanti, 2020; Wenger, Lundström, & Schulze, 2023). In the Greek area, the research of Botsoglou, Hrisikou & Kakana (2011) found that in no outdoor play area was there any suitable equipment for children with special educational needs (SEN), the research of Mitta (2016) focuses on the formation of public space for entertainment of children with or without

disabilities with corresponding interviews of children about what they would like in a playground, while that of Politi & Botsoglou (2018), records the opinions of parents of children with special educational needs (SEN) regarding the accessibility and suitability of outdoor playgrounds in Thessaloniki for their children. The safety and maintenance of playgrounds is the subject of the researches of Foundoulaki (2019) and Asvos (2020), while finally the research of Papasotiri (2023) concerned the observation of the free play of two groups of children (typically developing) in three outdoor spaces of area of Agrinio, one of which was a city playground, without focusing on its use by children with disabilities. The present work is oriented towards the intersection of the opinions of engineers-architects as well as special and general education teachers so that the knowledge is combined and there is a substantial care to strengthen the play of all children with each other without exclusions and obstacles.

3. Method

3.1 Purpose of the Research

The purpose of the research is to investigate the opinions of outdoor playground designers (civil engineers-architects) as well as general and special education teachers regarding the design of inclusive playgrounds.

3.2 Research Questions

First research question: How appropriate and accessible are outdoor play spaces for children with disabilities?

Second research question: To what extent do architects-designers of outdoor playgrounds and teachers (general and special education) consider the design of inclusive playgrounds necessary?

Third research question: Under what conditions does the design of outdoor play spaces help engage children with disabilities in creative play and interaction with peers?

3.3 The Research Tool

The basic tool - questionnaire was designed by the researcher with great care to fulfill the purpose of the research and was based on both the literature and the experience of the researcher. At the end of the design of the questionnaire, it was recorded in a Microsoft Word format file, so that it could be printed and distributed by the researcher personally, but also recorded in the Google Forms electronic platform, so that it could be distributed electronically. Initially, in the design of the questionnaire, a short note to the participants was preceded by which the researcher informed them that completing the questionnaire was not mandatory and assured them that only their answers to the questions would be used and that their anonymity would be respected. After the formulation of the questionnaire was completed it was given for pilot filling in three people, one from each category of participants (designers of outdoor playgrounds, general and special education teachers) who were close to the researcher and were asked to fill it in while highlighting the errors and omissions they would find, so that they could be corrected before giving to supplement the participant pool (Cohen et.al. 2008). The pilot group

immediately completed the questionnaire and assured the researcher that the questions are completely understandable and clear and do not require clarification. The questionnaire consists of a total of 34 closed-ended, multiple-choice, and basic Likert-scale questions with ratings ranging from "Not at all" to "Very much." In particular, 12 of the 34 questions concern the demographic data of the participants, with questions such as gender, age, marital status, number of children, the existence of a disabled child in the family/friends environment, status, previous service, their area of residence, level of education and qualifications. These questions provide important information for understanding participants and interpreting research results, as they can help to understand the characteristics of the sample being studied. The remaining 22 questions concern the opinions and attitudes of the participants regarding play and playgrounds. Specifically, these questions refer to issues such as the assessment of the accessibility of playgrounds for children with disabilities, their opinion on the importance of playgrounds in children's development, as well as their perception of the importance of inclusive play spaces. Through these questions, it can be understood how the participants perceive the role of playgrounds in their community and how they see the need for improvements in the accessibility and quality of these spaces. Taken together, these questions can provide important information about the need for improvements to existing playgrounds and the creation of new play spaces that better serve the needs of all children. In addition, they can offer suggestions for improving the accessibility and quality of playgrounds for all children. At the end of the questionnaire, the researcher thanked the participants for their valuable help in completing the present research effort.

3.4 Sample Survey

98 people participated in the survey, of which 64 (percentage 65.3%) were women and 34 (percentage 34.7%) were men (Chart 1). Regarding their age, it is observed that the sample is almost equally divided, with 25 of the 98, a percentage of 25.5%, belonging to the age group from 22-30 years old, 27, a percentage of 27.6%, belonging to the age group from 31-40 years, the 26, rate 26.5%, in the group from 26.5% and the 20 of them, rate 20.4%, in the age group over 50 years.

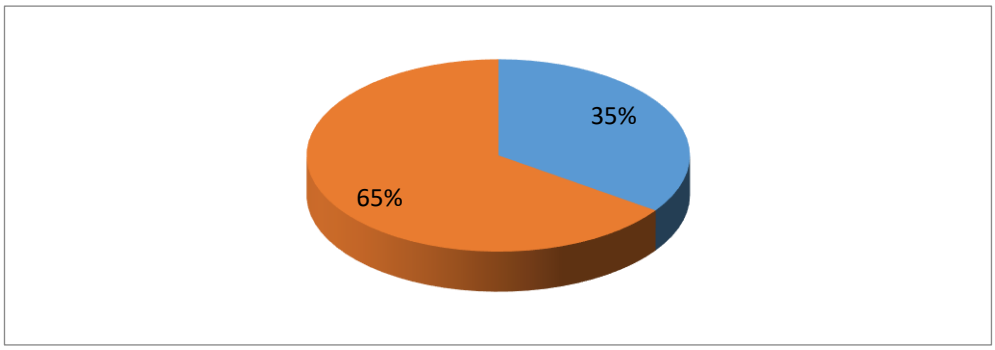

Figure 1. Gender

Regarding the professional status of the research participants, a percentage of 69.4%, i.e. 68 people, are teachers, where 30 (30.6%) are special education teachers, 27 (27.6%) are teachers class and 11 (11.2%) are specialty teachers. Also, 18.4% (, i.e. 18 people), are civil engineers and 12.2% (, i.e. 12 people), are architects (Chart 2).

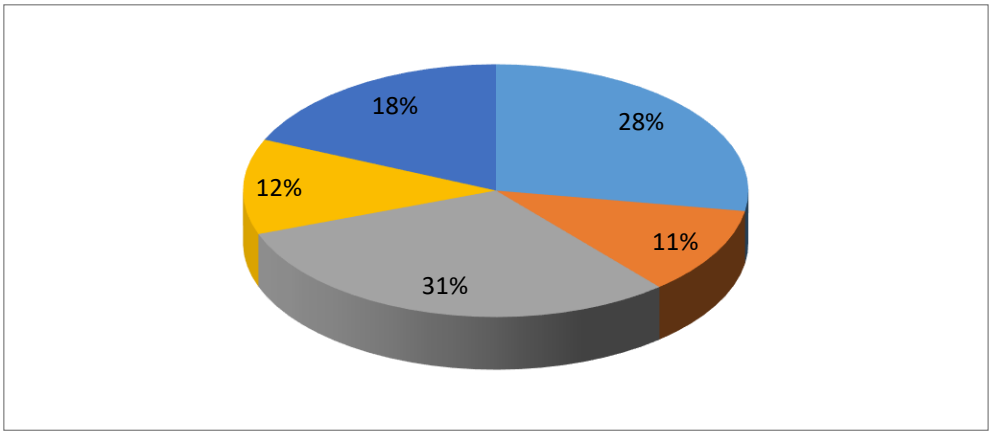

Figure 2. Capacity

3.5 Validity and Reliability of the Research

An internal consistency/consistency reliability test was performed, which assesses the extent to which all items in a questionnaire measure the same characteristic. This control is assessed by calculating the Cronbach's Alpha coefficient, which is an index used to measure the degree to which a set of questions has consistency, coherence and homogeneity (Stalikas et al., 2012) Its value ranges between 0 and 1, with 1 indicating maximum reliability. Usually, if Cronbach's Alpha is greater than 0.7 it is considered acceptable to assess the reliability of a questionnaire. In the present case, the value of Cronbach's Alpha is 0.909, which indicates a very high reliability for the set of questions studied. This suggests that the questions are a coherent and reliable measure for the survey conducted.

4. Results

Studying, initially, the variables of the questionnaire with gender, it is observed that for the variables that have a statistically significant correlation this is low, as the values of the coefficient are less than 0.399.

Table 1. Correlation of Variables with Gender

		gender
Qualitative game	Correlation Coefficient	0,350***
	P-Value	0
It is important that people with disabilities play out	Correlation Coefficient	-0,261**
	P-Value	0,009
When you were a child you visited outdoor play areas/playgrounds	Correlation Coefficient	-0,244*
	P-Value	0,016
Characteristics of Outdoor Play Space	Correlation Coefficient	0,298**
	P-Value	0,003
Designing Inclusive Playgrounds	Correlation Coefficient	0,235*
	P-Value	0,020
Accessibility of Inclusive Playgrounds	Correlation Coefficient	0,272**
	P-Value	0,007
Essential Elements of Inclusive Playgrounds	Correlation Coefficient	0,391***
	P-Value	0

The results related to the age variable are similar, as the correlation coefficient values are low. This suggests that gender and age may influence these variables, but there may be other factors influencing the results. Regarding the professional status of the participants, the negative correlation it shows with their views on the accessibility of inclusive playgrounds and the necessary elements in them is worth mentioning. More specifically, the negative correlation indicates that the more “high”-relevant a person's occupational status is, the more negative their perception of the accessibility and necessary elements in these spaces. This may be due to the fact that people with a more relevant professional status may have more demanding expectations or be more informed about the specifications and requirements of these spaces. These findings highlight the importance of designing and creating quality, accessible and safe play spaces that are integrated into the natural environment, as these can promote the proper development and participation of individuals in play activities.

In relation to the first research question and based on the analysis carried out, it appears that outdoor play areas are not sufficiently suitable and accessible for children with disabilities. The correlations observed between characteristics of outdoor play spaces and views on the importance of accessibility and inclusive playground design indicate that there are inadequacies in the way outdoor spaces are designed that prevent the active participation of children with disabilities in play activities and interaction with their peers. Regarding the second research question, the architects-designers of outdoor play spaces and teachers, especially those of general and special education, consider the design of inclusive children's spaces necessary to a fairly high degree to promote social integration, access to educational resources and skills development for all children.

Finally, regarding the third research question and based on the analysis, the quality of play,

access to outdoor play areas, accessibility and safety of inclusive playgrounds seem to be related to the ability of children with disabilities to participate in games and activities. Overall, the playground design process should consider the diversity of needs and preferences of all stakeholders, including educators, parents, and children, to create an environment that promotes safety, health, and creativity of the children.

5. Discussion

The focus of this work was the investigation of the views of outdoor playground designers (architects-civil engineers) but also of special and general education teachers as well as their possible differentiation regarding the design and construction of inclusive playgrounds. Overall, different professional groups have different perceptions, with classroom teachers emphasizing motor development, while special education teachers focus more on the social and emotional aspect. At the same time, architects and civil engineers recognize the importance of play in mental development. The diversity of these views highlights the need for a qualitative and tailored approach to game use.

All groups of research participants highlight the fact that the playground environment, its accessibility and usability without physical or social barriers, ensures that all children, regardless of their abilities or limitations, have access to safe, accessible and interesting activities (Unicef, 2021). The correlations presented provide insight into survey participants' perceptions of play spaces and provide information that can assist in the development of policies or programs to improve the accessibility and quality of play spaces. The literature review and the findings of the present research support the fact that the design of inclusive children's spaces requires the involvement of many different agencies and professionals, in order to ensure that the space will be adapted and accessible for all children. Teachers have the experience and knowledge of the needs of children in a children's area. Their experience can help determine the appropriate activities and facilities for children with all needs. Architects and space designers have the experience and technical knowledge to design functional and accessible spaces for children. Including the needs of children with disabilities is critical to the success of the plan (Mor, 2023). These specialists have the experience and knowledge of the needs of children with special educational or therapeutic needs. Their input into the design of the space can ensure that the space is adapted for all children (Van Engelen, et al., 2021; Brown, et al., 2021) Parents and guardians of children are important stakeholders in the process planning, as they can provide information about their children's needs and preferences (Mitta, 2016; Taylor, et al., 2023). Local authorities, community representatives and concerned citizens can provide valuable input and suggestions for spatial planning, taking into account the needs and preferences of the community as a whole (Lynch, Moore & Prellwitz, 2018b; Wenger, et al., 2023). Of course, interviews and conversations with the original users of outdoor public play spaces, the children, could be the starting point for designing materials and spaces for children's play. The stories children tell and the details of their play can extend investigations and generate meaningful findings. In the last decade, the efforts of an interdisciplinary range of researchers to include children both in the design of research and in the design of the spaces

that concern them are encouraging (Germanos & Liapis, 2015; Germanos, 2018; Taylor, et al., 2023). Children have the same rights as adults for a city that is friendly to their needs and their views are important.

The findings of the present research, which are consistent with the findings of other research in the literature review above, conclude that the construction of inclusive children's spaces is critical to creating an environment that promotes the equality, dignity and well-being of all children framed by the architectural movement of Universal Design. An architectural movement that defines the basic design principles of outdoor play spaces (Unicef, 2021) and focuses on the design of products and environments that can be used by everyone including people with disabilities. It is essential that all parties involved in the design of inclusive playgrounds are trained and equipped with knowledge so as to respond to the philosophy of Universal Design. An architectural movement that defines the basic design principles of outdoor play spaces (Unicef, 2021) and focuses on the design of products and environments that can be used by everyone including people with disabilities. It is essential that all parties involved in the design of inclusive playgrounds are trained and equipped with knowledge so as to respond to the philosophy of Universal Design. It is an investment for the future that leads to a more open, solidarity and progressive society, an interdisciplinary commitment to child-friendly cities, to cities and societies shared by all, to the fair participation of all in the problems and challenges of the 21st century (Soulis, 2020).

The existence of methodological weaknesses imposes limitations on its conclusions present investigation. Initially, limitations arise from the final size of the sample (98 people) in relation to the initial one (150) as well as in relation to the population it represents. That is, issues of generalization arise. The greater the number of people participating in the research, the more reliable the results of the research (Bryman, 2017). At the same time, the limitations related to gender are evident as the sample consisted in the majority of women. Also, when the questionnaires are sent by post or online (using the Google Forms platform), it cannot be proven that the person filling out the questionnaire belongs to any of the groups of people to whom it is addressed. The combination of other research methods, such as interviewing and observation or completely distributing the questionnaires with the personal responsibility and presence of the researcher would help the validity of the results. The research was limited to a single city, Agrinio. A corresponding investigation could be carried out that would concern the entire law of Aetoloakarnania, in Western Greece or even in the whole country. The generalization of the results of the specific research to be possible its findings must be contrasted with the findings of future ones, research that will take into account the aforementioned limitations.

Future research could further investigate the construction of playgrounds where the main emphasis is on social inclusion, a term supported both in the research review and in the results of the present research, that is to investigate what kind of playground equipment can specifically support and encourage social inclusion. More research is also needed on outdoor play activities that will engage children of all abilities. Finally, future research could be conducted exclusively in a student population, discussing and cross-referencing the views of primary and secondary school students regarding inclusive play, its dimensions and how to

integrate it into education.

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Authors contributions

Dr. Garifalia Papasotiri was responsible for study design and revising, for data collection. For drafting the manuscript and revised it.

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