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FUTURE EDUCATORS' PERCEPTIONS ABOUT VICARIANCE AS A DESIGN TOOL IN EARLY CHILDHOOD EDUCATION SERVICES IN THE CASE OF THE PRESENCE OF VISUALLY IMPAIRED CHILDREN

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Abstract

Neuroscience studies have demonstrated the centrality of the body within cognitive processes, highlighting the deep connection between perception, action and cognition. Vicariance would be configured as a creative capacity of the brain that would allow human beings to find alternative and original solutions to resolve the complexity and unpredictability of reality. Vicariance would therefore represent human beings' adaptive capacity and respond to their need to be available to flexibility and change, which is indispensable for their survival. In the presence of visual impairment, this creative force would allow the body to vicariate the functions of the organ of sight, enhancing the development of the other senses and movement. This evidence can be fully applied in educational research, where biological and cultural elements meet. Within educational processes, and particularly those involving visually impaired children, vicariance can take on a dual perspective. Firstly, it refers to the biological capacity of the visually impaired child's body to identify solutions that compensate for the absence of sight and secondly, to the educator's capacity to identify solutions that respond to the specificity of the child's educational needs, adopting an *Adaptive Decision-Making* perspective. Based on these considerations, a questionnaire was administered to a group of students enrolled in the degree course in Educational Sciences at the University of Salerno during the teaching of "Inclusive design of Early Childhood Services" in the first semester of the current academic year. This questionnaire was aimed at investigating the perceptions of future educators regarding the design of educational activities in early childhood contexts where there were children with visual disabilities. Therefore, the present study aims to analyse whether the scientific evidence regarding the function of vicariance in education is reflected in the results of the questionnaire and how future educators imagine they can use this creative ability as a tool to design educational activities in early childhood contexts with visually impaired children to realise inclusive educational processes, which respond to the needs of all and each one.

Keywords: *Visual impairment, early childhood education services, vicariance, educational design, inclusion.*

1. Introduction

Pedagogical design in early childhood education services represents a fundamental element in constructing quality educational contexts, promoting the well-being, development and learning of children in the 0-3 age group (Bianquin & Bulgarelli, 2022). It is a reflexive, intentional and dynamic process that orients everyday educational practices and ensures consistency with a shared pedagogical vision. Far from being a mere programming of activities, pedagogical design takes on a deeper meaning, expressing a particular image of the child, education, and society. The idea behind the pedagogical work in the nurseries is that of considering the child as a competent person, active in the construction of his or her knowledge, the bearer of rights and the protagonist of his or her growth path, promoting constant exploration and social interaction and encouraging his or her full autonomy (Aiello, 2023). Therefore, the focus is on the specific characteristics of each child to create a place that promotes the well-being of the individual and the entire group (Montessori, 1999). The relationship with the adult and peers is at the heart of design, since learning and personal development are nurtured through interactions. For this reason, pedagogical design becomes an essential tool for creating spaces suitable for developing meaningful relationships, which foster exchanges between peers in a climate of positive affectivity, encouraging social responsibility processes (Amadoro *et al.*, 2024). Furthermore, in the project action, great importance is given to constructing a stimulating environment that supports exploration, learning and growth through numerous activities and play opportunities. For this reason, it is necessary to devote particular care to the arrangement of spaces and furnishings, the choice of materials, the organisation of time, and the design of educational experiences

that can effectively accommodate the different changes the child will try as he or she grows. According to Montessori, the richness of the environment, understood as the presence of stimuli organised according to reasoned educational reflection, is directly proportional to the child's cognitive development. The importance of perception within cognitive processes, nowadays confirmed by studies in the field of neuroscience, has historically been emphasised in education. Indeed, sensory education represents a fundamental cognitive experience that precedes higher intellectual activities for children in the 0-6 age group (Montecchiani & Paolini, 2011). It appears to be further enhanced in the presence of visual disabilities, since in this case stimulation of the senses is necessary to vicariate the absence of sight to allow the child with this type of disability to create the mental images through which to construct his or her knowledge of the world.

From a neuroscientific point of view, vicariance takes the form of a creative capacity of the brain that allows human beings to find alternative and original solutions to solve the complexity and unpredictability of reality, enabling them to adapt and respond to their need for flexibility and openness to change, which are essential for survival (Berthoz, 2015). About visual impairment, vicariousness refers to the extraordinary ability of the human brain to adapt and reorganise its functions when one of the senses is impaired or absent. When one sense, such as sight, is no longer available, the other senses (touch, hearing, smell, taste) play a more critical role in perceiving the environment and gathering information. The deprivation of sight necessarily entails a functional reorganisation expressed through the strategic use of the other senses and specific cognitive functions. Sensory vicariousness determines how pupils with visual impairment interact with the world, learn and develop cognitively. Touch becomes the primary sense used to explore the environment and learn concepts (Caldin, Polato, 2023).

Concerning educational contexts, particularly those that include visually impaired children, vicariousness has a dual meaning. On the one hand, it takes the form of the natural predisposition of the blind child's body to develop alternative mechanisms that compensate for the loss of visual function. On the other hand, it is expressed in the ability of the educational professional to define solutions and design interventions specifically tailored to the child's particular educational needs, implementing an *Adaptive Decision Making* strategy (Caldin, Polato, 2023). In this way, it allows overcoming methodological rigidity and identifying didactic deviations to address the complexity of teaching and learning (Sibilio, 2017).

Starting from these premises, the research aimed to explore future educators' perceptions regarding the design of activities in early childhood contexts in the presence of visually impaired children. In particular, a qualitative-quantitative questionnaire was administered to a group of students enrolled in the third year of the degree course in Educational Sciences, specialising in "Educators in early childhood services", at the University of Salerno (Italy), who attended the course "Inclusive design of early childhood services". The sample was asked to imagine designing an educational activity in a context where at least one visually impaired child was present. The objective was to find out, through the analysis of the answers provided, what the recurrent design elements were, to understand if the outcome of the research confirmed the scientific evidence of the reference literature on the centrality of vicariance understood in its double meaning, that is, as the educator's design ability aimed at developing a capacity that is biologically inherent in every child and necessary for their development.

2. Methodology

2.1. Objective

The present work set out to investigate a twofold objective. Firstly, it aimed to analyse the perceptions of future educators in early childhood services regarding how educational activities are designed in the presence of visually impaired children. Based on the data obtained, the second objective was to verify whether it confirms the evidence of the scientific literature of reference regarding the importance of proximity as a fundamental element in designing educational activities in early childhood contexts where children with visual disabilities are present.

2.2. Sample

The sample analysed consisted of 43 students enrolled in the third year of the degree course in Educational Sciences, specialising in 'Educators in Early Childhood Services', at the University of Salerno (Italy). They attended the course 'Inclusive Design of Early Childhood Services' during the first semester of the 2024-2025 academic year.

2.3. Survey tool and process

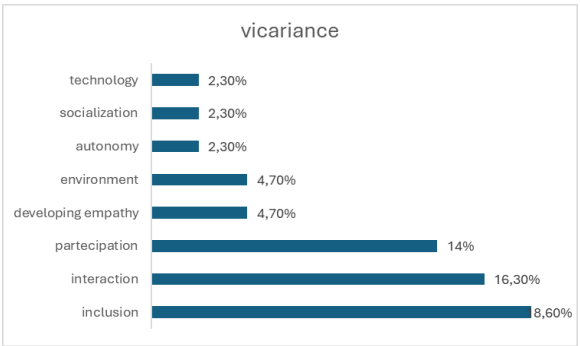
The survey instrument used was a qualitative-quantitative questionnaire with eighteen questions divided into three sections. Section no. 1 (items 1 - 7) was dedicated to gathering socio-demographic information, relating to age, gender, place of origin and course of study. Section no. 2 (items 8 - 16)

collected information on the traineeship experience (activity included in the study pathway). They were asked to indicate the type of facility dedicated to early childhood services where the experience took place (item 9), whether there were children with disabilities (item 12) and, if so, to specify the type of disability (item 13). Finally, it was asked whether the kind of activities designed in contexts where children with disabilities were present had favoured the process of their inclusion within the educational context (item 15). Section no. 3 (items 17 - 18) aimed at gathering information on the perceptions of future educators regarding the design of activities in educational contexts where there were children with disabilities (item 17) and, in particular, with visual disabilities (item 18). More specifically, they were asked to imagine and describe the educational activities designed in the specific contexts outlined above. The questionnaire was administered during the first lesson, so the sample's answers were not influenced by the knowledge gained from attending the course. Still, it expressed personal impressions resulting from direct experience in the field and their sensitivity. The object of the research was to determine the answers to question no. 18 ("If in the imagined educational context there was the presence of one or more visually impaired children, what activities would you plan to respond to their specific educational needs and favour their inclusion process within the educational context?"), for which a thematic type of analysis was chosen. It involved highlighting the key terms, which were then subdivided according to their frequency index and, finally, grouped into macro-categories.

2.4. Data analysis and discussion

As regards the first section of the questionnaire on socio-demographic data, analysis of the data collected shows that the entire sample comes from Campania, the region in southern Italy where the university is located. Most of the sample (72%) comes from Salerno and its province. In comparison, a fair percentage (16%) comes from the city of Naples, the regional capital, and its province. Finally, the remainder of the sample came from the other provinces of the region and their relative provinces (5% respectively from Avellino and Benevento and their relative provinces, and 2% from the city of Caserta and its province). Most of the sample (98%) is female, while 2% claim to be male. Most of the sample (92%) were between 21 and 25 years old, while 6% were under 20, and only 2% were over 25. The second section of the questionnaire, which referred to the training experience carried out (as provided for in the study plan), most of the sample (91%) stated that it took place in nurseries, 7% in pre-schools and 2% in other facilities. To the question concerning the presence of children with disabilities in the facilities where this activity is carried out (item 12), only 16% of the sample answered in the affirmative, and, from the answers given to the next question (item 13), this presence is concentrated exclusively in nurseries. Concerning the third section, which is aimed at investigating how future educators imagine designing activities within early childhood contexts in which there is the presence of children with visual disabilities, the totality of the sample refers to vicariance as a central element of the design activity. The term "vicariance" is associated with "inclusion" (18.6%), "interaction" (16.3%), "participation" (14%) and "motor, cognitive and social development" (9.3%). Further associations emerge with the terms “development of empathy” and “environment” (both 4.7%); “socialisation”, “autonomy” and “technology” (2.3%) [figure 1].

Figure 1.



Through thematic analysis of the answers provided, it emerged that the totality of the sample imagines designing educational activities within early childhood contexts in the presence of visually impaired children using vicariance through sensory education. However, most of the sample considers touch and hearing as vicarious senses of sight, and only a minority also explicitly refers to taste and smell. No one, on the other hand, takes haptic perception, considered the sixth sense and fundamental for people with visual disabilities, into account. A further interesting observation concerns the percentage of the sample convinced that educational design centred on the vicariance favours empathy development.

This idea seems justified by the fact that the vicarious use of the other senses in place of sight would allow a "change of perspective" for children without visual impairment that would bring them closer to the condition of peers with this type of disability. Therefore, sharing the same condition would be functional to understanding it, thus participating in the deconstruction of prejudice against the different. Moreover, sharing the same condition would seem to favour recognition of and attention to the needs of the other. In this sense, this would favour collaboration between peers and the active participation of the visually impaired child, contributing to improving the general class group's inclusion level. According to the answers provided by the sample, sensory education would also be functional to the child's motor, social and cognitive development. This finding seems interesting because it reveals a holistic approach to the dimension of a person that is very close to the biopsychosocial perspective on which the ICF-CY is based. Still, it identifies its justification in the *embodied* dimension of knowledge. It would be sensory education realised through the perception of the senses that vicariate sight that would favour the contextual development of the three dimensions of the person: physical, relational and intellectual. This would confirm the recognition of the centrality of the body (albeit deprived of a sense and of the so-called 'sense of distance' to the advantage of the senses considered 'of proximity' - touch, hearing, taste and smell) within the person's development process. Part of the sample also recognises a central role for the environment, understood as a multifactorial element made up of physical and relational elements, and considers it fundamental to the realisation of a design aimed at enhancing sensorial education by effectively responding to the educational needs of children and children with visual disabilities. Finally, the data relative to the use of technology as a tool to design educational activities centred on the functional use of sensory vicariance leaves one somewhat perplexed. The low percentage recorded by the figure in question seems to be at odds with the figure relating to the average age of the sample, which places it in the generation of digital natives. This contradiction could be justified by the lack of knowledge of the educational potential of technologies that, on the contrary, according to the evidence of the scientific literature in the sector, represent a concrete tool for designing personalised educational paths. For this reason, they would be truly capable of responding to everyone’s educational needs and, therefore, would be highly inclusive.

3. Conclusions

The data that emerged from the research seem to confirm the evidence of the scientific literature in the sector regarding the centrality of vicariance as an indispensable tool for the design of educational activities in early childhood contexts where there is the presence of children with visual disabilities. The most frequent terminological connection is precisely "vicariance-inclusion". However, it should be noted that the property of vicariance can be understood in an ambivalent manner and concern, in this sense, both the organic faculty of the child and the design capacity of the educators to identify solutions that meet the specific educational needs of the children (Caldin, Polato, 2023). In the first case, the design of educational activities that stimulate the development of vicariance, understood as the biological faculty of the human being, would make it possible to foster the development of divergent thinking and creativity in children (Zollo *et al.*, 2015). This would also be consistent with what is indicated by recent European legislation on the subject and, in particular, the *Council Conclusions on the role of early childhood education and primary education in promoting creativity, innovation and digital competence*, which established the importance of fostering creativity from early childhood onwards by making explicit reference to the need for 'modernisation of pedagogical approaches, teaching resources and the learning environment' (2015/C 172/05). In the educational sphere, the acquisition of creative thinking skills could be a valid strategy to promote educational interventions aimed at deciphering complexity and dealing with its pitfalls (Zollo *et al.*, 2015; Amadoro *et al.* 2024b). In the specific case of children with visual disabilities, the design of educational activities that tend to enhance this ability would have the twofold objective of responding to a particular need of the child with this type of disability, since he or she needs to *train* the other senses to compensate for the absence of sight and, at the same time, would respond to the need shared with his or her peers to foster the development of creative ability. Furthermore, designing educational activities centred on vicariance would respond, more generically, to the need common to children in the 0-6 age group to use sensorial exploration as the primary vehicle for knowledge of reality, as confirmed by Montessori's pedagogy (Montessori, 1938).

In conclusion, vicariance, understood as a central component of educational design in early childhood services, even in contexts where there are visually impaired children, is an element that is doubly linked to the theme of inclusion. Responding to needs shared by all and specific to some, vicariance would allow the development of skills necessary for the child in that age group.

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