

## Social and Pedagogical Conditions for Adaptation of Preschool Children with Special Educational Needs to an Inclusive Environment Through Games: Bibliometric Mapping of the Literature (1975-2025)

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### Abstract

The purpose of this study is to map the scientific landscape of research on the social and pedagogical conditions that support the adaptation of children with special educational needs to inclusive preschool environments through play-based interventions. The analysis covers the period from 1975 to 2025 and is based on metadata from 4,461 journal articles indexed in the Web of Science database. The bibliometric analysis was conducted following the PRISMA framework. The study examined trends in publication growth, author productivity, and the social, intellectual, and conceptual structures of the research field. The main findings reveal that research on the adaptation of children with special educational needs in inclusive preschool environments has steadily increased over the past decades, with particularly strong growth between 2008 and 2012. Publications appear across a wide range of journals, mainly within the areas of educational research, special education, and rehabilitation. Scholars from many regions contribute to this field, with the United Kingdom, Germany, and the United States emerging as leading contributors. The analysis also indicates that the research community is relatively fragmented, consisting of several research groups with limited interaction among them. Overall, the field is interdisciplinary, integrating perspectives from education, medicine, and psychology. Over the past 50 years, major research themes have included nosological aspects of special education, academic achievement and educational outcomes, age-related and institutional aspects of special education, early childhood and preschool education, collaboration and partnership in education, conceptual foundations of inclusive pedagogy, and teacher professional competence in inclusive education.

**Keywords:** *Bibliometric review, VOSViewer, kindergarten adaptation, preschoolers with special educational needs, inclusive environment, play-based interventions, socio-pedagogical conditions.*

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## **Introduction**

In key international documents such as the United Nations Convention on the Rights of the Child (United Nations, 1989), the Salamanca Statement on Principles, Policy and Practice in Special Needs Education (UNESCO, 1994), and the United Nations Convention on the Rights of Persons with Disabilities (United Nations, 2006), inclusive education is recognised as a fundamental right of every child. These frameworks reflect a global movement toward developing educational systems that guarantee equal learning opportunities for all children, regardless of their individual abilities, characteristics, or educational needs. The principle of inclusion (Ainscow & César, 2006; Florian, 2019; Clarke & Lorenz, 2024) is based on the philosophy of humanism and social justice, recognising the inherent value of every individual and emphasizing the need to create conditions that allow all members of society to participate fully in social and educational life. The foundations of successful inclusion are established during the preschool years. According to Vygotsky's cultural historical theory (Bozhovich, 2004) and contemporary developmental psychology research (Peng, 2023), the period from three to six years is characterised by high sensitivity to social influences and the rapid development of basic mental functions. Studies have shown that during this stage, children develop voluntary mental processes, the symbolic function of consciousness, and early ethical concepts and social skills (Baldwin, 1924; Körükçü, 2015). Therefore, the quality of the social environment plays a crucial role in shaping the trajectory of a child's later personal and intellectual development.

### *1.1 The Problem of Adaptation of Children with Special Educational Needs*

The integration of children with special educational needs (SEN) into the inclusive environment of kindergarten represents a complex process of adaptation. In psychological and pedagogical terms, adaptation is understood as an active process through which individuals adjust to changing environmental conditions (Bjorklund, 2015; Tenbrink, 2003; Timberlake, 2020). This process includes both the assimilation of new norms and behavioural rules and the transformation of the environment to better meet the needs of the adapting individual.

According to Lubovsky (2011), children with special educational needs (SEN), including those with intellectual disabilities, autism spectrum disorders, sensory impairments, speech disorders, and developmental delays, often face specific challenges when adapting to group activities. Communication barriers may appear through limited verbal and nonverbal interaction with peers

and adults. Difficulties in learning social norms are often related to differences in how social information is perceived and processed, as well as to the underdevelopment of social learning mechanisms. In addition, cognitive challenges may arise from uneven development of cognitive processes, which makes it necessary to apply individualized approaches when organising the educational process. The success of the adaptation process largely depends on the creation of optimal social and pedagogical conditions. These conditions are understood as a combination of external and internal factors within the educational environment that can either support or hinder the effective adaptation of children with SEN to the inclusive setting of a preschool organisation.

### *1.2 The Role of Play-based Interventions in Adaptational Processes*

One of the most effective tools for creating favourable social and pedagogical conditions for adaptation is play-based interventions. According to Elkonin's periodisation of psychological development, play is the leading type of activity during the preschool years and plays a key role in shaping the main psychological developments characteristic of this stage.

Play-based interventions (Baikulova, 2024; Baisheva et al., 2017; Korkmaz & Yurtseven Avci, 2016) have several unique characteristics that make them effective for supporting children's development. They are naturally engaging for children, create a supportive environment for social interaction, allow children to model different life situations in a safe setting, and provide opportunities for repeated practice and reinforcement of social skills. These interventions are especially important for children with SEN (Drewes, 2006; Gibson, 2021), as they can reduce anxiety, support the expression of individual abilities, and help compensate for developmental difficulties through alternative ways of interacting with the environment. In addition, play-based approaches provide natural opportunities for self-expression and for working through adaptation challenges, which supports more effective inclusion within peer groups in inclusive preschool settings (Reichenberger et al., 2025).

Despite the recognised importance of play-based interventions (Bodrova et al., 2023), their scientifically grounded and systematic use for creating effective social pedagogical conditions for adaptation still requires deeper investigation. Many existing approaches to using play-based interventions in inclusive education remain largely empirical. There is a clear lack of systematic analysis of scientific evidence regarding the most effective types of play-based interventions, the optimal conditions for their implementation, and reliable criteria for evaluating the effectiveness

of play interaction in supporting the adaptation of children with special educational needs in inclusive preschool environments.

### **Literature Review**

Contemporary understanding of adaptation is based on the integration of several theoretical perspectives. Selye's (1937) biological concept of adaptation describes adaptation as a universal mechanism through which an organism adjusts to environmental stressors by mobilising protective resources. When applied to an educational context, the inclusion of a child with special educational needs in a new inclusive environment can be viewed as a form of adaptational stress that requires the activation of compensatory mechanisms to support adjustment and functioning. Piaget's (1976) psychological theory of adaptation defines adaptation as a balance between the processes of assimilation and accommodation. Assimilation refers to the incorporation of new information into existing cognitive schemas, while accommodation involves modifying these schemas in response to new experiences or information. For children with SEN, this adaptive process can be more complex due to differences in cognitive development, which makes targeted pedagogical support especially important in helping them successfully adjust to new learning environments.

The social psychological approach, developed in the works of A. V. Petrovsky and V. A. Petrovsky (Petrovsky, 2021), views adaptation as the process through which an individual enters and becomes integrated into a new social environment. Within this framework, three stages are identified. The first stage is adaptation, during which individuals learn and accept the norms and values of the group. The second stage is individualisation, where the individual seeks ways to express personal traits and uniqueness within the group. The third stage is integration, in which the group recognizes and accepts the individual's personality characteristics, allowing for full participation in the social environment.

#### *1.3 Specificity of Adaptational Processes in Children with SEN*

Research by Florian and Rouse (2009) shows that the adaptation of children with special educational needs to an inclusive environment has several distinctive characteristics. They identify three key components of successful adaptation (Mokhampanyane, 2024). The first is academic integration, which refers to the child's ability to engage with and progress in the educational program. The second is social integration, meaning the child's inclusion in peer relationships and

participation in the social life of the group. The third is emotional adaptation, which involves developing a positive attitude toward learning and feeling comfortable within the educational environment.

Baker et al. (2003), in a longitudinal study, found that the successful adaptation of children with SEN depends on the interaction between individual and environmental factors. Individual factors include the type and degree of impairment, the level of cognitive development, and communication abilities. Environmental factors include the readiness of teachers to support inclusion, the attitudes of peers, and the organizational culture of the educational institution.

#### *1.4 Theoretical Foundations of Play-based Interventions in the Context of Adaptation*

Fundamental research into the nature of play has provided a basis for understanding the adaptive potential of play-based interventions. Huizinga (1938), in his cultural-philosophical concept *Homo Ludens*, defined play as a primary form of human activity underlying all cultural expression. Piaget (1962) regarded symbolic play as a central mechanism of cognitive development, enabling children to actively construct representations of the world through processes of assimilation and accommodation. Winnicott (1971) conceptualised play as a transitional space between the child's inner world and external reality, within which the capacity for healthy social relationships is developed.

Bruner (1972) showed that play activity creates optimal conditions for the development of language and symbolic thinking in children. Lillard (1993), through experimental studies, showed that symbolic play supports the development of executive functions and cognitive flexibility. Neuropsychological research by Pellis and Pellis (2007) further indicates that play activates multiple brain structures, including the prefrontal cortex and the hippocampus, which helps explain the therapeutic benefits of play-based interventions for children with developmental disorders. From an evolutionary psychology perspective, Gray (2011) argues that play functions as an adaptive mechanism that promotes behavioural flexibility and strengthens the capacity for social learning.

#### *1.5 Play-based Interventions in Working with Children with SEN*

Axline (1947), the founder of non-directive play therapy, demonstrated that a play environment provides children with emotional difficulties a natural opportunity for self-expression and for

working through psychological problems. Landreth (2002), within the framework of child-centred play therapy, showed that play can activate children's internal resources for self-healing and emotional growth. More recent studies in the field of autism spectrum disorders have demonstrated the effectiveness of structured play-based interventions in improving communication and social interaction skills (Kasari et al., 2010; Metin Aslan, 2024; Schreibman et al., 2015). In addition, Hughes (2009) developed the principles of inclusive play, which emphasize creating play environments that provide equal opportunities for participation for all children, regardless of their abilities.

### *1.6 Contemporary Empirical Research*

Contemporary research in the field of inclusive education is grounded in an interdisciplinary approach that integrates findings from special pedagogy, developmental psychology, and social work (Barreto, 2023; DeLuca, 2013; Vaccari, 2023). Within this framework, the successful integration of children with SEN is understood as the outcome of a complex interaction between individual characteristics of the child and the social and pedagogical conditions of the educational environment.

The strongest empirical evidence supporting the effectiveness of play-based interventions has been found in studies of autism spectrum disorders. Systematic reviews and meta-analyses have quantitatively confirmed that parent-mediated play interventions can significantly improve social communication and language skills, while also contributing to a reduction in the severity of autism related characteristics (Oono et al., 2013; Sandbank et al., 2020).

Research by Stagnitti et al. (2012) demonstrates the cross-cultural validity of play-based interventions. Studies conducted in different national contexts have shown significant improvements in social, emotional, and cognitive adaptation among preschool children participating in experimental groups (Garaigordobil et al., 2022; Tervaniemi et al., 2023). The most effective implementation of play-based interventions occurs within comprehensive service provision models that combine early intervention with preschool education. These models are characterized by multidisciplinary collaboration, integration of services, the use of multimodal intervention strategies, and the creation of high-intensity inclusive learning environments.

### *1.7 Gaps in Contemporary Research*

Despite the growing body of empirical evidence demonstrating the effectiveness of play-based interventions for supporting the adaptation of children with SEN in inclusive environments (Danniels & Pyle, 2023), the field remains fragmented. Research is characterized by methodological diversity, inconsistent study designs, and a lack of systematic synthesis of conceptual links between different approaches and their outcomes. Although individual studies report positive results (Movahedazarhouli, 2018), researchers and practitioners still face difficulties in developing a comprehensive understanding of the most effective strategies for applying play-based interventions across different categories of children with special educational needs. Bibliometric analysis, as a method for mapping the scientific landscape, can help address this fragmentation by visualizing conceptual relationships between studies, identifying key thematic clusters, highlighting influential authors and publications, and revealing gaps in the existing literature. This approach also makes it possible to determine promising directions for future research in the field of social pedagogical conditions that support the adaptation of children with SEN through play-based interventions.

The theoretical frameworks outlined in Sections 1.1–1.6 are not incidental to this bibliometric study but form its interpretive foundation. The biological (Selye, 1937), cognitive developmental (Piaget, 1962, 1976), and social psychological (Petrovsky, 2021) theories of adaptation define the conceptual dimensions along which research clusters in this field are organised and provide the analytical vocabulary needed to interpret why specific thematic groupings emerge in the bibliometric map. At the same time, the cultural philosophical (Huizinga, 1938), developmental (Bruner, 1972; Lillard, 1993; Winnicott, 1971), neuropsychological (Gray, 2011; Pellis & Pellis, 2007), and clinical (Axline, 1947; Hughes, 2009; Kasari et al., 2010; Landreth, 2002; Schreibman et al., 2015) traditions of play research represent distinct intellectual lineages that coexist within the same field. The interaction of these traditions contributes to the interdisciplinary nature of the research area, the fragmentation observed in co-authorship networks, and the diversity of thematic directions identified through bibliometric analysis. Without this multi-theoretical framework, patterns revealed through co-citation analysis, keyword co-occurrence mapping, and collaboration network visualization would remain descriptive rather than analytically meaningful. Therefore, the theoretical overview functions not merely as a literature review but as a conceptual lens through which the bibliometric structure of the field is interpreted.

### *1.8 Purpose and Objectives of the Research*

The purpose of this study is to conduct a bibliometric mapping of the scientific landscape related to the social and pedagogical conditions that support the adaptation of children with special educational needs to inclusive preschool environments through play-based interventions during the period 1975–2025. The aim is to systematize the accumulated scientific knowledge in this field and identify promising directions for future research. To achieve the stated purpose, the following objectives were defined:

1) To analyse the dynamics of publication activity in the research area over a fifty-year period in order to identify the main stages in the development of the field and determine the trajectory of its growth.

2) To identify the most productive publication sources, leading researchers, and countries that have made significant contributions to the development of scientific knowledge on the use of play-based interventions in the inclusive education of children with SEN.

3) To map networks of scientific collaboration among researchers, institutions, and countries in order to identify centres of scientific expertise and patterns of international cooperation in this field.

4) To determine interdisciplinary connections and identify the scientific disciplines that form the intellectual foundation of research on the social and pedagogical conditions supporting the adaptation of children with SEN through play-based interventions.

5) To identify and systematize the main thematic clusters of research that reflect the conceptual structure of the field and the evolution of key directions in studying the adaptation of children with special educational needs in inclusive environments.

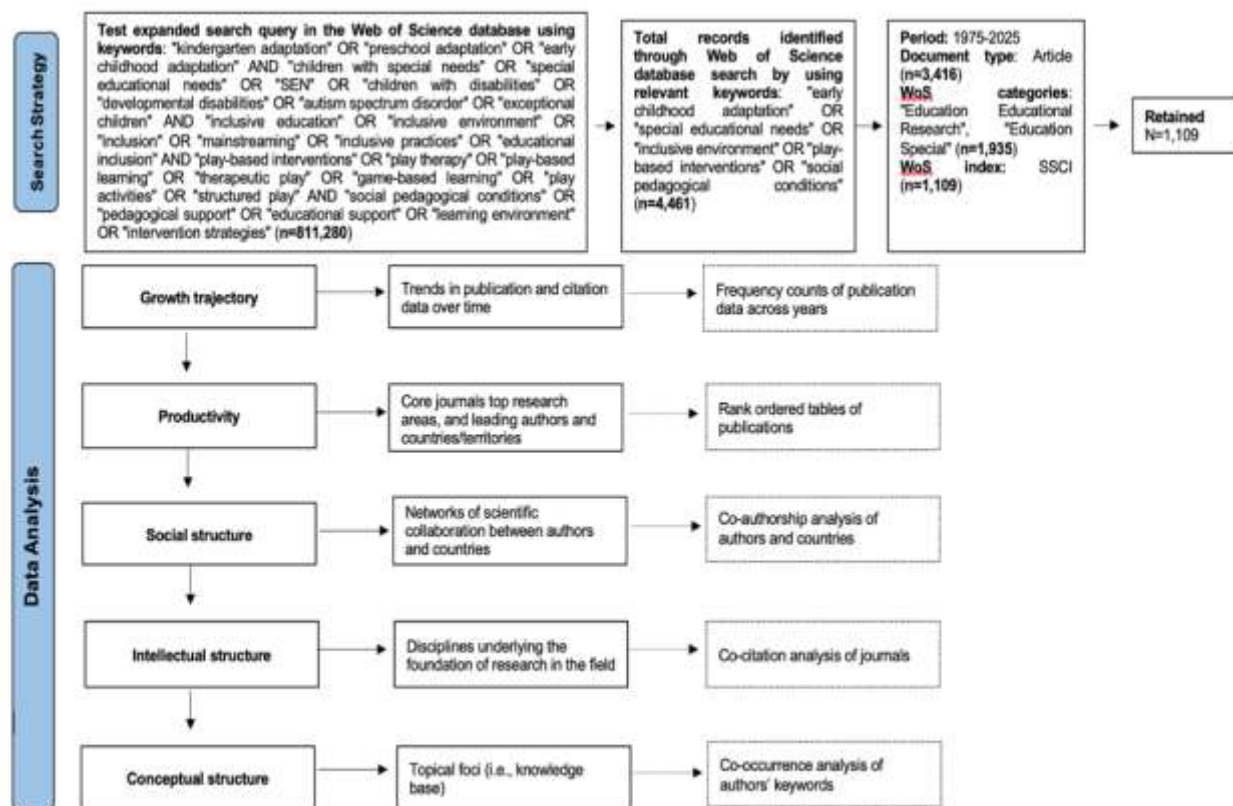
## **Method**

### *2.1 Research Design*

The research dataset for the period 1975–2025 was compiled using the Social Sciences Citation Index of the Web of Science (WoS) platform. The selection of the WoS database as the primary source of bibliometric data is justified by several methodological advantages. These include extensive historical coverage, which enables retrospective analysis of publication activity over several decades; an interdisciplinary indexing system that includes 22,778 peer reviewed journals

across a wide range of scientific fields; strict selection criteria that ensure the high quality of indexed publications; and a well-developed citation analysis system that allows the evaluation of scientific influence and research impact while facilitating the search and systematisation of relevant literature. The overall methodological design of the bibliometric study is illustrated in Figure 1, while detailed descriptions of each stage of the analysis are presented in the following sections of the study.

**Figure 1**  
*Methodological Design*



Source: Sydykbayeva et al., 2025

## 2.2 Information Search Strategy

At the initial stage of the study, a test expanded search query was developed using a comprehensive set of key terms to ensure broad coverage of relevant publications and reduce the risk of omitting significant scientific works. The query included combinations of terms related to preschool adaptation, children with special educational needs, inclusive education, play-based interventions, and social pedagogical conditions. Specifically, the search included expressions such as

"kindergarten adaptation" OR "preschool adaptation" OR "early childhood adaptation" AND "children with special needs" OR "special educational needs" OR "SEN" OR "children with disabilities" OR "developmental disabilities" OR "autism spectrum disorder" OR "exceptional children" AND "inclusive education" OR "inclusive environment" OR "inclusion" OR "mainstreaming" OR "inclusive practices" OR "educational inclusion" AND "play-based interventions" OR "play therapy" OR "play-based learning" OR "therapeutic play" OR "game-based learning" OR "play activities" OR "structured play" AND "social pedagogical conditions" OR "pedagogical support" OR "educational support" OR "learning environment" OR "intervention strategies". This initial search produced a very large dataset of publications (n = 811,280), which required further refinement and clarification of selection criteria to establish a more focused and manageable data corpus for subsequent bibliometric analysis. To refine the search process, the research group clarified the conceptual framework and selected terms most frequently used in the international academic literature. The final search included the following key expressions: "early childhood adaptation" OR "special educational needs" OR "inclusive environment" OR "play-based interventions" OR "social pedagogical conditions". This adjustment significantly narrowed the pool of potentially relevant publications, reducing the dataset to 4,461 documents. The temporal scope of the study covered the period from 1975 to 2025, and no language restrictions were applied in order to ensure maximum representativeness of the sample. The application of the publication type criterion, specifically limiting the dataset to 'articles', ensured that only peer reviewed journal articles were included while books, book chapters, and conference proceedings were excluded. This step reduced the total number of identified publications to 3,416. The next stage of selection was based on the Web of Science categorical classification, focusing on the categories 'Educational Research in Education' and 'Education Special', which further narrowed the dataset to 1,935 publications. The final filtering criterion involved restricting the dataset to publications indexed within the Social Sciences Citation Index (SSCI) of the Web of Science platform. This step ensured a high level of academic quality and resulted in the final dataset used for bibliometric analysis, consisting of 1,109 publications. From each article, the following information was extracted: the article title, year of publication, journal name, citation index indicators, and author identification details including institutional affiliation and geographical location. In addition, author abstracts, keywords, and the bibliographic references cited in the

articles were collected and organised. This process allowed the creation of a comprehensive database that served as the foundation for conducting the bibliometric analysis.

### *2.3 Data Analysis Procedures*

Bibliometric analysis was conducted using the VOSviewer software, which is designed for the visualisation and construction of bibliometric maps. In VOSviewer, analytical units are represented as nodes, where the size of each node reflects its relative significance. The spatial position of nodes indicates the degree of similarity or relatedness between them, while the connections between nodes are represented by lines whose thickness corresponds to the strength of their relationships. Different colours are used to show cluster membership among the nodes. The algorithm used to construct bibliometric maps includes three main stages: normalisation of node characteristics, two-dimensional projection of the data, and clustering. To examine the social structure of the scientific field, co authorship analysis was conducted at the level of individual researchers and countries. This allowed the identification of patterns of scientific collaboration and the main contributors within the research area. The intellectual structure of the field was analysed through co citation analysis of journals, where groups of frequently cited periodicals were interpreted as representing the core disciplinary foundations of the research area. The conceptual structure was identified through analysis of the co-occurrence of author keywords, where clusters of related terms indicated the main thematic directions addressed in the scientific literature.

## **Findings**

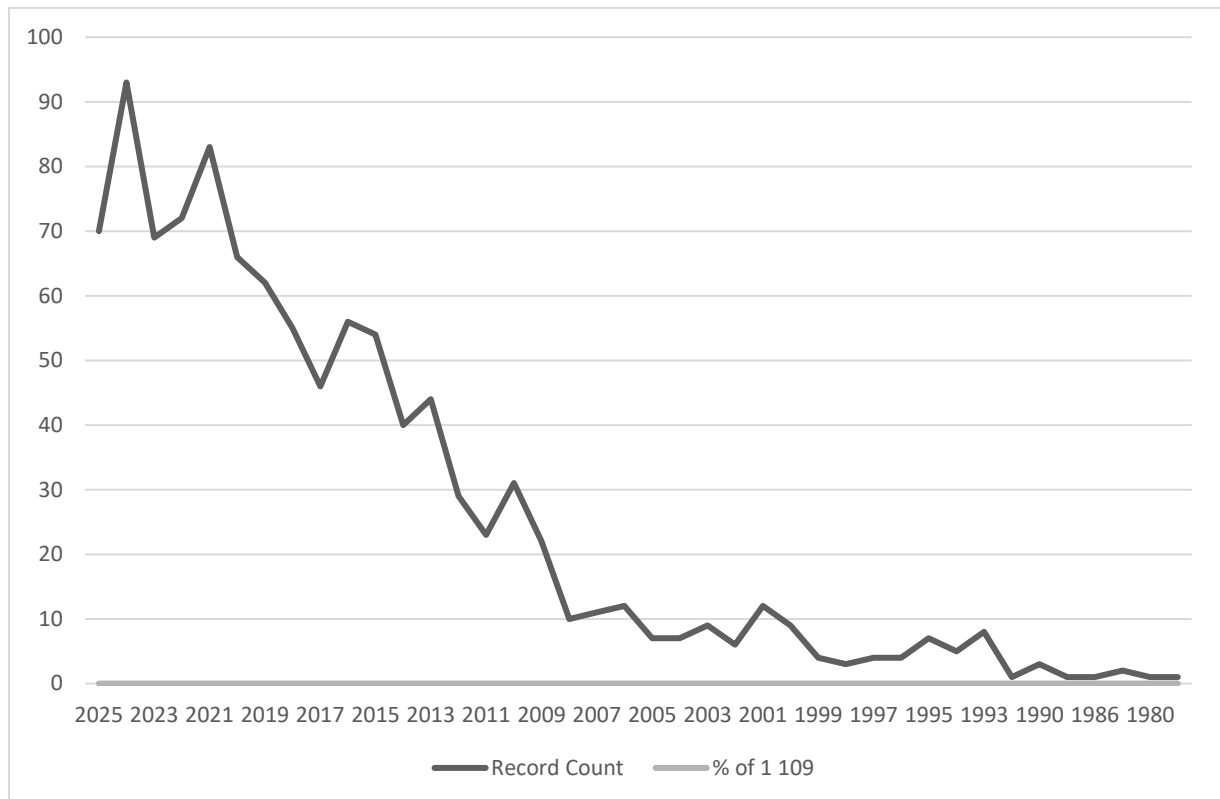
### *3.1 Evolutionary Dynamics of Research Activity: A Bibliometric Analysis of Publication Trends and Citation Patterns in the Field of Study*

Analysis of the temporal dynamics of publications on the topic of social pedagogical conditions for adaptation of preschool children with special educational needs to an inclusive environment through play shows an uneven development of scientific interest in this research area (Figure 2). The first individual publications appeared in 1977, but until the 1990s scientific activity remained sporadic. During the period from 1980 to 1990 the number of studies remained very low, with only

about 1 to 3 publications per year, which suggests that this stage represented the early formation of the conceptual foundations of the research field.

## Figure 2

*Growth of Research on Social and Pedagogical Conditions for Adaptation of Preschool Children with Special Educational Needs to an Inclusive Environment Through Play*



Sustained growth in publication activity began in the 1990s, when the average annual number of publications increased to approximately four to eight studies per year. A noticeable intensification of scientific interest emerged after 2000, with the period from 2008 to 2012 marked by a sharp rise in the number of publications, increasing from 10 to 29 studies annually. The highest level of publication activity occurred between 2013 and 2025, when the average annual number of studies stabilised between 40 and 93 publications per year. The peak values were observed in 2024, with 93 publications representing 8.386% of the total dataset, and in 2021, with 83 publications representing 7.484%. These trends reflect the growing global attention to the issue of inclusive

education for preschool children with special educational needs, particularly in relation to the use of play-based approaches.

The emergence of publication activity in this field is shaped by the evolution of legislative frameworks in special education and shifts in paradigmatic approaches to inclusive learning. The adoption of the Education for All Handicapped Children Act in 1975 established the legal foundations for inclusive practice, although time was required for the development of a corresponding research base. The expansion of educational opportunities for children with disabilities in the least restrictive environment during the 1980s and 1990s stimulated growing scholarly interest in inclusive methodologies. From the early 2000s, the shift towards play-based learning in early education programmes, alongside increasing recognition of early childhood as a critical developmental period, contributed to the intensification of research in this area over the past two decades.

### *3.1b Periodic Analysis of Research Variables Across Five Decades (1975–2025)*

The bibliometric mapping conducted in this study is structured around three core research variables that correspond directly to the key components of the study title and define the analytical logic of the investigation.

Variable 1 - Social conditions of adaptation encompasses the totality of external social environmental factors within the inclusive preschool setting that determine the quality of the child's integration into the peer group and collective life of the kindergarten. These conditions include the character of peer relationships, the attitudes of typically developing children and their families toward children with SEN, the level of social support from educators and specialists, and the degree of family involvement in the educational process. In the present bibliometric study, this variable is traced through the co-occurrence of keywords *social participation, peer relationships, collaboration, parents, support, diversity, equity, and inclusive environment* across the WoS SSCI corpus. The identification of social conditions as a distinct variable is grounded in the social-psychological theory of adaptation (Petrovsky, 2021), which establishes peer group acceptance as a precondition for successful integration, and is confirmed by Baker et al. (1994), who demonstrate empirically that peer attitudes constitute one of the two primary environmental determinants of adaptive outcomes for children with SEN.

Variable 2 - Pedagogical conditions of adaptation refers to the system of purposefully organized instructional, curricular, and professional measures implemented by educators that create the conditions necessary for the active participation, learning, and development of children with SEN within an inclusive preschool environment. These conditions encompass the professional competence and readiness of teachers, the availability of specialized support staff, the application of individualized and differentiated approaches to instruction, and the organizational culture of the educational institution as a whole. In bibliometric terms, this variable is identified through the keyword clusters associated with *special educational needs*, *teacher effectiveness*, *teacher training*, *teaching assistants*, *inclusive practice*, and *educational interventions*. Its status as a distinct variable is justified by Florian and Rouse (2009), who establish teacher readiness and institutional culture as the primary pedagogical determinants of adaptive success, and is structurally confirmed by the dominant position of the *Education Educational Research* and *Education Special WoS* categories, which together encompass the entire present corpus of 1,109 publications.

Variable 3 - Play-based interventions denotes the system of structured and semi-structured play activities that are purposefully designed and implemented to support the developmental, communicative, social, and adaptive functioning of preschool children with SEN in the context of inclusive education. These interventions include directed and non-directed play therapy, cooperative game-based learning, role play, and peer-mediated play programs that create natural opportunities for social interaction and adaptive skill development. In bibliometric terms, this variable is identified through the keyword clusters *play-based interventions*, *play-based learning*, *early childhood*, *play therapy*, and *preschool education*, and through the green co-citation cluster of developmental psychology and ASD journals (n = 74 journals, Figure 5). The justification for treating play-based interventions as a theoretically independent variable — rather than as a subcategory of pedagogical conditions — rests on Elkonin's (2005) concept of play as the *leading type of activity* of the preschool developmental period, which assigns play a qualitatively distinct role as the primary mechanism through which preschool-age children develop social, cognitive, and adaptive capacities. This theoretical position is supported empirically by Kasari et al. (2010), Sandbank et al. (2020), and Stagnitti et al. (2012), whose findings confirm that play-based interventions produce measurable adaptive outcomes that are distinct from and complementary to direct instructional approaches.

**Table 1**

*Periodic Bibliometric Analysis of Three Research Variables: Social Conditions, Pedagogical Conditions, and Play-Based Interventions (WoS SSCI, 1975–2025, N = 1,109)*

Period	Variable 1: Social Conditions of Adaptation	Variable 2: Pedagogical Conditions of Adaptation	Variable 3: Play-Based Interventions
1975–1985	Absent as a distinct variable. Social context is framed exclusively through a deficit lens: keywords <i>handicapped</i> , <i>mainstreaming</i> . The concept of inclusive social conditions does not yet appear in the WoS SSCI corpus. No keyword co-occurrence links social participation to inclusive preschool environments.	Nascent. PL 94-142 (1975) mandates the least-restrictive environment, generating the first studies on placement and segregated special schooling. Pedagogical vocabulary is custodial rather than adaptive. Keywords <i>pedagogical support</i> and <i>inclusive practice</i> are absent from VOSviewer clusters.	Absent from the WoS SSCI corpus. Play therapy literature exists (Axline, 1947; Landreth, 2002) but remains outside the educational research indexing system. No co-occurrence links between <i>play</i> and <i>SEN</i> or <i>preschool inclusion</i> are identifiable in this period.
1985–1995	Emerging. First WoS-indexed studies examine peer interaction and social integration of children with SEN. The Salamanca Statement (1994) introduces <i>inclusive social environment</i> as a policy construct. VOSviewer grey cluster keywords ( <i>disability</i> , <i>integration</i> , <i>mainstream education</i> ) reflect this transitional discourse.	Growing. Shift from custodial to instructional models; first empirical studies on teacher attitudes toward inclusion appear in the red co-citation cluster journals. The term <i>special educational needs</i> (Warnock Report) begins to replace <i>handicap</i> in WoS keyword indexing.	Nascent. Theoretical frameworks for play as a developmental tool begin to enter the SEN literature through Vygotsky and Elkonin frameworks. First co-citation links between the green cluster journals (developmental psychology) and red cluster (special education) begin to form.
1995–2005	Developing. Keywords <i>social participation</i> , <i>peer relationships</i> , and <i>social network analysis</i> appear in the green VOSviewer cluster. First studies on social outcomes of inclusion in early childhood settings are indexed. Family involvement begins to emerge as a social condition keyword in the light-blue cluster ( <i>parents</i> , <i>collaboration</i> ).	Consolidating. IDEA reauthorisations (1997, 2004) drive empirical research on individualised adaptation strategies. UDL principles are introduced; growth in studies on differentiated instruction for preschoolers with SEN. Co-citation links between the blue cluster journals (educational psychology) and red cluster (special education) strengthen noticeably.	Emerging. <i>Play-based learning</i> and <i>early childhood</i> begin to co-occur in the same keyword cluster (green VOSviewer cluster). First systematic studies on play therapy outcomes for children with ASD appear in the WoS corpus. The variable remains conceptually separated from pedagogical conditions in this period.
2005–2015	Substantial growth. The light-blue VOSviewer cluster ( <i>collaboration</i> , <i>communication</i> , <i>parents</i> , <i>support</i> ) becomes a stable node. Purple	Dominant. Sharp publication rise (10–29 papers per year, 2008–2012). The orange cluster ( <i>awareness</i> , <i>teacher effectiveness</i> , <i>inclusive</i>	Established. <i>Play-based interventions</i> becomes a stable keyword node. Kasari et al. (2010) RCT on joint engagement

	cluster concepts ( <i>disability, education</i> ) and brown cluster ( <i>diversity, equity, inclusive pedagogy</i> ) reflect growing social justice discourse. Social conditions achieve conceptual independence as a distinct keyword dimension in WoS indexing.	and brown cluster ( <i>teacher training, prospective teachers</i> ) emerge as independent nodes. Pedagogical conditions become the single most productive thematic direction, driving the peak growth of the period.	and Oono et al. (2013) Cochrane review provide landmark empirical evidence. The green VOSviewer cluster ( <i>early childhood, preschool education, co-education</i> ) and the green co-citation cluster (ASD and developmental psychology journals) confirm the variable's empirical consolidation.
2015–2025	Mature and complex. The light-blue cluster ( <i>parents, support, collaboration</i> ) and purple cluster ( <i>equity, diversity, inclusive pedagogy</i> ) reach peak keyword frequency. Social conditions are now conceptualised as a multi-actor construct involving peers, families, teachers, and institutions. Peak publication years 2021 (83 papers, 7.48%) and 2024 (93 papers, 8.39%) are driven largely by social conditions research. England (34.4%), Germany (8.4%), and Ireland (6.2%) lead production in this variable.	Dominant and diversified. The orange cluster ( <i>teacher effectiveness, awareness</i> ), brown cluster ( <i>teacher training, primary school</i> ), and dark-blue cluster ( <i>teaching assistants, initial teacher training</i> ) all reach peak keyword frequency. The European Journal of Special Needs Education (172 papers, 15.51%) and International Journal of Inclusive Education (163 papers, 14.70%) concentrate predominantly on pedagogical conditions research. Leading authors Schwab S (28 papers) and Norwich B (17 papers) are the primary contributors to this variable.	Highly productive and interdisciplinary. Sandbank et al. (2020) meta-analysis and Stagnitti et al. (2012) cross-cultural study provide the empirical anchor. The green co-citation cluster expands to 74 journals, confirming the broadest disciplinary reach of all three variables. <i>Play-based interventions</i> achieves full conceptual integration with both social and pedagogical conditions variables, reflected in the central position of <i>special educational needs</i> as the connecting node across all twelve thematic clusters in Figure 6.

The periodic analysis presented in Table 1 reveals several important patterns in the evolution of the three research variables. First, the three variables did not develop simultaneously or at a uniform pace. The pedagogical conditions variable achieved conceptual independence earliest, driven by legislative mandates and the growth of teacher-centred research; the social conditions variable developed in parallel but required the emergence of social justice discourse post-2005 to reach full maturity; while the play-based interventions variable was the last to be integrated into the mainstream WoS SSCI corpus, achieving empirical consolidation only in the 2005–2015 period. Second, the most significant contrast between periods lies between 2005–2015 and 2015–2025: the latter period concentrates 61.32% of all publications and is characterised by the

simultaneous co-activation of all three variables within the same thematic clusters, a pattern not observable in any earlier period. Third, the period 1975–1985 stands in maximum contrast to 2015–2025: none of the three variables of the present study’s title is present as a recognisable construct in the WoS SSCI keyword co-occurrence networks of the earliest decade, whereas by 2015–2025 all three are densely interconnected central nodes in the VOSviewer conceptual map (Figure 6).

### 3.2 Productivity: Core journals, top research areas, leading authors and countries/territories, and related findings

**Table 2**

#### WOS Data Analysis

Criteria	Data	Records	% of 1,109
Web of Science Index	Social Sciences Citation Index (SSCI)	1109	100.000
	Arts & Humanities Citation Index (A&HCI)	24	2.164
	Science Citation Index Expanded (SCI-EXPANDED)	22	1.984
	Conference Proceedings Citation Index – Social Science & Humanities (CPCI-SSH)	5	0.451
Web of Science Categories	Education Educational Research	771	69.522
	Education Special	339	30.568
	Rehabilitation	135	12.173
	Psychology Educational	38	3.427
	Psychology Developmental	25	2.254
Research Areas	Education Educational Research	1109	100.000
	Rehabilitation	135	12.173
	Psychology	64	5.771
	Linguistics	15	1.353
Authors	Schwab S	28	2.525
	Norwich B	17	1.533
	Mccoy S	11	0.992
	Webster R	10	0.902
Publication Titles	European Journal of Special Needs Education	172	15.509
	International Journal of Inclusive Education	163	14.698
	British Educational Research Journal	50	4.509
	International Journal of Disability Development and Education	47	4.238
Countries/Regions	England	382	34.445
	Germany	93	8.386
	USA	81	7.304
	Ireland	69	6.222
Document Types	Article	1109	100.000

	Early Access	66	5.951
	Proceeding Paper	5	0.451
	Retracted Publication	2	0.180
Languages	English	1060	95.582
	German	27	2.435
	Spanish	17	1.533
	Dutch	4	0.361

Table 2 presents a comprehensive overview of productivity indicators derived from the Web of Science database, including the most productive journals, main research areas, leading authors, and the countries or territories that contribute most actively to the development of this research field.

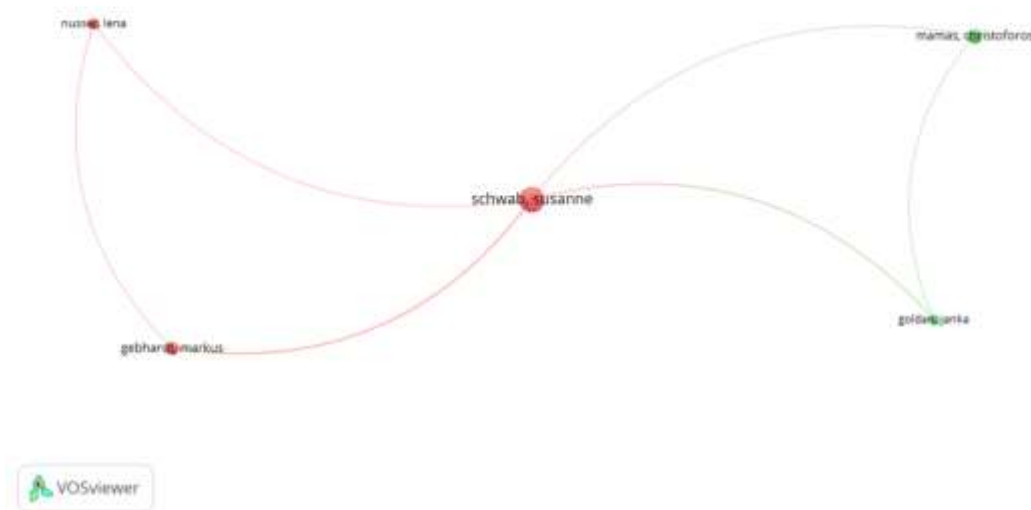
The distribution of publications by citation indices shows that the majority of studies belong to the interdisciplinary field of social sciences. All analysed works are included in the Social Sciences Citation Index (SSCI), while representation in other indices is limited. Only 24 publications (2.164%) are indexed in the Arts & Humanities Citation Index (A&HCI), and 22 publications (1.984%) appear in the Science Citation Index Expanded (SCI-EXPANDED). Representation in the Conference Proceedings Citation Index is minimal, accounting for only five records (0.451%). The thematic classification of the publications demonstrates a clear dominance of educational research areas. The category 'Education Educational Research' includes 771 publications (69.522%), while 'Education Special' accounts for 339 works (30.568%). The contribution of related disciplines is also visible, particularly in the category 'Rehabilitation', which includes 135 publications (12.173%), as well as in psychological research areas such as 'Psychology Educational' with 38 records (3.427%) and 'Psychology Developmental' with 25 records (2.254%). Analysis of author productivity shows that several researchers play a leading role in the development of this field. The most productive authors include Schwab S with 28 publications (2.525%), Norwich B with 17 publications (1.533%), Mccoy S with 11 publications (0.992%), and Webster R with 10 publications (0.902%). These results indicate the presence of established research groups and continuity of scientific work within the area. The distribution of publications across journals shows a strong concentration in specialised academic outlets. The European Journal of Special Needs Education leads with 172 publications (15.509%), followed by the International Journal of Inclusive Education with 163 publications (14.698%). Other important

journals include the British Educational Research Journal with 50 publications (4.509%) and the International Journal of Disability Development and Education with 47 publications (4.238%). The geographical distribution of publications shows the clear dominance of English-speaking countries in this research field. England holds the leading position with 382 publications (34.445%), followed by Germany with 93 works (8.386%), the United States with 81 publications (7.304%), and Ireland with 69 studies (6.222%). Linguistic analysis also shows the strong predominance of English as the main language of scientific communication, accounting for 1,060 publications (95.582%). German language studies represent 27 publications (2.435%), Spanish language publications account for 17 works (1.533%), and Dutch language studies include 4 publications (0.361%). The typological structure of the dataset is characterised by the overwhelming dominance of journal articles, with 66 publications (5.951%) identified as having early access status.

### 3.3 Social structure: Networks of scientific collaboration between authors and countries

### Figure 3

*Networks of Scientific Collaboration Between Authors (n=5)*



Analysis of co-authorship networks in research on the adaptation of preschool children with special educational needs to an inclusive environment through play reveals the formation of two main



seven countries, mainly represents the German-speaking research space and consists of Austria, Canada, France, Germany, Luxembourg, South Africa, and Switzerland, indicating stable academic connections among countries with well-developed inclusive education systems. The green cluster also includes seven countries and is centred around Northern European and Scandinavian regions, bringing together Belgium, Denmark, Indonesia, the Netherlands, Norway, Scotland, and Sweden, which reflects active cooperation between developed European states and developing regions. The blue cluster represents the English-speaking research space and includes Australia, Chile, England, Ireland, Malaysia, New Zealand, and Northern Ireland, showing the strong influence of the British educational tradition. The yellow cluster unites the Czech Republic, Kazakhstan, China, Russia, Singapore, Slovenia and the United Arab Emirates, indicating the formation of new research alliances among countries with transition economies and developing systems. The purple cluster consists of Mediterranean and Southern European countries, including Cyprus, Greece, Italy, Poland, Spain, and Turkey, and reflects regional cooperation in the development of inclusive preschool education research. The light blue cluster includes Israel, Portugal, and the United States, forming a small but potentially intensive collaboration group. The orange cluster connects Finland and Turkey, suggesting a specialised bilateral research partnership. Finally, the grey cluster includes only Wales, indicating its unique position within the network of international collaborations or a specific research focus within the field.

The formation of these collaboration clusters is influenced by a combination of historical, cultural, linguistic, and geographical factors, as well as similarities in national educational systems. Linguistic clustering is especially visible in the English-speaking and German-speaking groups, reflecting long-standing academic connections and shared methodological traditions in the study of inclusive education. Political and economic alliances also play an important role in shaping research partnerships, which explains the grouping of several European Union countries into common clusters and the emergence of transatlantic scientific cooperation. In addition, the level of economic development and the maturity of national education systems influence the capacity of countries to participate in international research networks. This is reflected in the central role of highly developed countries within the collaboration network, while developing states tend to occupy more peripheral positions. Institutional factors, including the presence of specialised research centres and international academic mobility programmes, also contribute to the

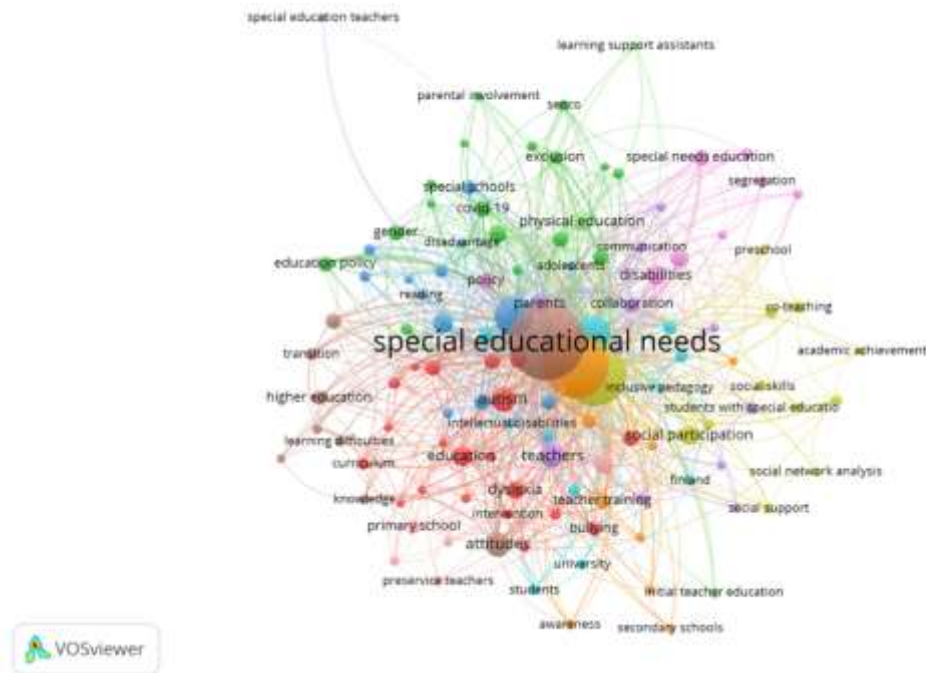


their frequent co citation in studies on the theory and practice of special education. The green cluster (n = 74 journals) contains publications focused on clinical and developmental research areas, including journals on autism, developmental psychology, child development, behavioural disorders, and early childhood development. The large size of this cluster highlights the important contribution of medical and psychological research to the study of special educational needs. The blue cluster (n = 52 journals) brings together journals related to educational psychology and research methodology, including publications focused on educational psychology, research methods, psychological assessment, and educational evaluation. This cluster forms because these journals often publish empirical studies on the educational development of children with SEN. The yellow cluster (n = 22 journals) includes specialised journals focused on educational leadership, teacher education, international comparative research, and intervention strategies in special education. Its smaller size reflects the more specialised professional focus of these publications. The purple cluster (n = 17 journals) includes journals related to educational technology, computer-assisted learning, economics of education, and educational policy analysis. The limited size of this cluster reflects the interdisciplinary nature of research connecting education with technological and policy-related studies. The light blue cluster (n = 17 journals) focuses on highly specialised publications related to speech and language disorders, including journals addressing dyslexia, language disorders, and speech therapy. The formation of this cluster reflects the strong specialisation of research on linguistic and communication difficulties among children with special educational needs. Finally, the orange cluster (n = 11 journals) represents a specialised group of publications related to mathematics education, science education, and special education. This cluster includes journals focusing on STEM education as well as inclusive teaching practices, showing the conceptual link between research on STEM learning and inclusive pedagogy.

### 3.5 Conceptual structure: Topical foci (i.e., knowledge base)

**Figure 6**

*Co-occurrence Analysis of Authors' Keywords (n=120)*



Analysis of the conceptual structure of research on social pedagogical conditions for the adaptation of preschool children with special educational needs to an inclusive environment through play identified twelve thematic clusters that reflect the main directions of scientific discourse in this field (Figure 6). The most central and frequently occurring concept is “special educational needs,” which serves as the core element connecting multiple research themes. The red cluster, consisting of 20 elements, includes key concepts of special education such as autism, autism spectrum disorders, dyslexia, Down syndrome, intellectual disabilities, and educational interventions, highlighting the strong influence of the nosological approach in studying special educational needs. The blue cluster, with 17 elements, focuses on academic achievements and educational outcomes, including attainment, achievement, wellbeing, and social participation, which reflects the increasing emphasis on evaluating the effectiveness of inclusive educational practices. The yellow cluster, containing 14 elements, represents age-related and institutional aspects of education, including adolescents, children, special schools, and reading, demonstrating the

importance of considering developmental stages in inclusive learning. The green cluster, with 12 elements, includes concepts related to early childhood, preschool education, co education, and social network analysis, emphasising the importance of early intervention and peer interaction within inclusive settings. The light blue cluster, consisting of 11 elements, focuses on collaboration, communication, parents, and support, highlighting the growing recognition of partnership between teachers, families, and other stakeholders in the educational process. The purple cluster, with 10 elements, includes concepts such as disability, diversity, equity, and inclusive pedagogy, reflecting the conceptual and philosophical foundations of modern inclusive education. The orange cluster, also containing nine elements, focuses on awareness, inclusive education, secondary schools, and teacher effectiveness, indicating the importance of teacher competence and professional awareness in successful inclusion.

The pink cluster, with nine elements, addresses attitudes, knowledge, learning difficulties, and transition processes, reflecting the psychological and cognitive aspects of inclusive education. The grey cluster, consisting of eight elements, includes disability, integration, and mainstream education, representing more traditional perspectives on special education. The brown cluster, with six elements, focuses on prospective teachers, primary school, and teacher training, emphasising the importance of preparing educators to work effectively in inclusive environments. The dark blue cluster, containing three elements, includes initial teacher training, teaching assistants, and physical education, representing specialised aspects of professional preparation. Finally, the black cluster, consisting of a single element, highlights special education teachers, underscoring their central role in the functioning of inclusive educational systems.

## **Discussion**

Positioning the results of the present study within the broader bibliometric literature on inclusive early childhood education and play-based interventions reveals both clear convergences with existing research trends and important differences that arise from the specific thematic focus, extended time frame, and methodological design of this study. The discussion is organized around five points of comparison, each of which addresses one or more of the three core research variables identified in this study: social conditions of adaptation (Variable 1), pedagogical conditions of adaptation (Variable 2), and play-based interventions (Variable 3).

Bal and Cengiz (2023) conducted a bibliometric analysis of research on inclusive education in early childhood using 261 articles from the Web of Science database and VOSviewer software. Their results showed that a stable network of scientific collaboration in this field has not yet formed and that the conceptual core of the literature began to develop mainly after 2014. The present study significantly expands these findings. The dataset includes 1,109 articles selected from an initial pool of 4,461 publications covering the period from 1975 to 2025, which allows the development of the research field to be traced across almost fifty years. The analysis shows that the first isolated publications appeared as early as 1977, which is earlier than indicated in previous reviews. A key difference also lies in thematic scope: while Bal and Cengiz examined inclusive preschool education in general terms, the present study integrates all three research variables within a single analytical framework, enabling the identification of more specific thematic clusters that would not be visible through broader analyses of inclusive education research. In terms of Variable 1, the present study reveals that social conditions of adaptation were entirely absent as a recognizable construct in the WoS SSCI corpus prior to 1985, whereas Bal and Cengiz's (2023) data suggest that even the general concept of inclusive early childhood education only gained conceptual coherence after 2014 - a finding consistent with our periodic analysis showing that all three variables reach full conceptual maturity only in the 2015–2025 period.

Li and Liu (2021) conducted a bibliometric analysis of publications on inclusive education in the Web of Science database for the period 1992 to 2020 and found that since 2012, the annual number of publications has consistently exceeded 100 studies. Their analysis identified the United States, the United Kingdom, and Australia as the most productive countries in this field, while the most frequently cited studies focused mainly on teacher attitudes toward inclusion and the effects of inclusive education - findings that align primarily with Variable 2 of the present study. The findings of the present study partly correspond with these trends, particularly in confirming the strong role of English-speaking countries in the production of research. However, the results also reveal a different geographical distribution of scientific activity: England occupies the first position with 34.4% of publications, while the United States ranks third with 7.3%, and Germany contributes a significant share with 8.4%. This divergence is directly attributable to the thematic focus of the present study on Variable 3 - play-based interventions in preschool settings - which shifts the centre of research activity toward European educational traditions that historically place strong emphasis on play as the leading form of activity in early childhood development (Elkonin,

2005). In methodological terms, the present research also extends the analysis of Li and Liu (2021): whereas their study relied on the HistCite Pro 2.0 toolkit, the use of VOSviewer in the present study allows simultaneous mapping of the social, intellectual, and conceptual structures of all three research variables, producing a more comprehensive and multi-layered visualization of the scientific landscape.

Reichenberger et al. (2025), in a scoping review of play-based interventions for children with disabilities in low- and middle-income countries, analyzed 20 studies identified through searches across five databases. Their findings highlighted significant gaps in knowledge regarding the scalability of such interventions and their cultural adaptation, and noted that most existing studies are short-term and rarely include cost-effectiveness analysis. These conclusions relate directly to Variable 3 of the present study. In contrast, the present bibliometric analysis focuses on the global body of scientific literature and examines the development of Variable 3 over a fifty-year period. The results reveal sustained growth in publication activity related to play-based interventions beginning around 2008–2012, and the identification of twelve major thematic clusters within the literature demonstrates that the variable has achieved full conceptual integration with Variables 1 and 2 by the 2015–2025 period. These findings provide a broader macro-level perspective that complements the micro-level conclusions of Reichenberger et al. (2025), particularly regarding the fragmentation of research communities and the limited cultural contextualization of individual intervention models - a pattern also clearly visible in the low-density co-authorship networks of the present study (Figure 3).

Arslan et al. (2024) conducted a bibliometric analysis of publications on special education indexed in the WoS database for the period 2011–2020. Their findings confirmed that the United States is the most productive country in the special education field, followed by England and Australia, and established a very strong positive correlation between the number of publications per country and their h-index ( $r = 0.929$ ), indicating that scientific quality and quantity co-develop within economically advanced nations. With respect to Variable 2, the present study partially converges with these findings: England leads the corpus with 34.4% of all publications, confirming its central role in pedagogical conditions research. However, a significant divergence emerges regarding the United States, which Arslan et al. (2024) identified as the dominant producer in the broad field of special education, whereas in the present study, the United States ranks third (7.3%), with Germany in second place (8.4%). This contrast reflects the specific scope of Variable 2 in the

present study, which is concentrated on preschool pedagogical conditions rather than the broader field of special education. Furthermore, Arslan et al. (2024) found only limited growth in WoS publications on special education between 2011 and 2020, whereas the periodic analysis presented in Table 2 reveals a markedly different pattern when the search is scoped to the intersection of all three variables: the 2015–2025 period alone accounts for 61.32% of the entire fifty-year corpus, demonstrating that the convergence of Variables 1, 2, and 3 as a joint research focus generates substantially accelerated growth compared to the broader field of special education.

He et al. (2024) used CiteSpace to analyze 1,024 WoS publications on inclusive education for children with SEN over the period 2015–2024 and identified four developmental stages: formation (2014), growth (2015–2016), maturity (2017–2020), and decline (2021–2024). Their analysis found that the highest-centrality emerging keyword across the decade was *social inclusion*. These findings are consistent with the periodic analysis of the present study in two important respects. First, the maturity phase identified by He et al. (2017–2020) aligns with the strong growth trajectory visible in Figure 2, where annual publications stabilize between 40 and 83 studies per year in the same years. Second, the dominance of *social inclusion* as the highest-centrality keyword in He et al.'s CiteSpace maps directly corresponds to the maturation of Variable 1 in the 2015–2025 period of the present study, where the light-blue cluster (*collaboration, parents, support*) and the purple cluster (*equity, diversity, inclusive pedagogy*) reach their highest keyword frequencies in the VOSviewer maps (Figure 6). A significant contrast exists, however, regarding Variable 3: He et al. (2024) report a relative decline in publication density after 2021 within the broader inclusive education field, whereas the present corpus — scoped specifically to the intersection of play-based interventions with SEN preschool adaptation — continues to show growth through 2024 (93 publications, 8.39%), suggesting that Variable 3 sustains research momentum in early childhood contexts even as the broader inclusive education field shows signs of saturation.

Danniels and Pyle (2023) conducted a qualitative multiple case study of kindergarten teachers who actively implemented inclusive play-based learning for children with developmental disabilities in Ontario, Canada. Their findings showed that the most effective teachers — termed *enactors* — consistently integrated social and pedagogical conditions as a unified framework: they scaffolded peer interactions (Variable 1) while simultaneously adapting the physical and instructional environment (Variable 2) to make play (Variable 3) accessible for all children. This empirical

conclusion from a micro-level qualitative study aligns closely with a key macro-level finding of the present bibliometric investigation: the convergence of all three variables into shared thematic clusters, visible in the VOSviewer keyword co-occurrence map (Figure 6), is most pronounced precisely in the 2015–2025 period, when research at the intersection of Variables 1, 2, and 3 reached its highest publication density (61.32% of the entire corpus). The central positioning of special educational needs as the connecting node across all twelve thematic clusters in Figure 6 structurally reflects the integrative approach that Danniels and Pyle (2023) describe at the classroom level. However, while their findings illuminate the practitioner perspective and micro-level dynamics of inclusive play-based learning, the present study reveals that the research communities producing knowledge in this area remain structurally fragmented — a pattern clearly demonstrated by the low-density co-authorship networks in Figure 3, where the two main author clusters show no direct collaborative links. This contrast between the conceptual integration of the three variables at the level of knowledge content and their structural fragmentation at the level of scientific community organization represents one of the central original contributions of the present bibliometric study.

The present study, therefore, does not simply replicate previous reviews but conceptually extends them by addressing the absence of bibliometric mapping at the intersection of all three research variables: social conditions of adaptation, pedagogical conditions of adaptation, and play-based interventions. By analyzing a representative corpus of global publications spanning fifty years, the study demonstrates how these variables have evolved from conceptually isolated constructs in 1975 to fully integrated dimensions of a mature interdisciplinary research field by 2025. This approach creates a foundation for a more systematic synthesis of accumulated knowledge and supports the development of more integrated and evidence-based research programs in the field of inclusive preschool education.

### **Conclusion**

The conducted bibliometric analysis of research on adaptation from 1975 to 2025 shows the development of a mature scientific field marked by a clear shift from medical and diagnostic perspectives toward social pedagogical approaches in understanding inclusive preschool education. The structure of international research collaboration reveals stable academic partnerships among countries with well-developed education systems, while the appearance of

new clusters involving countries with transition economies indicates the growing globalisation of research practices in the field of inclusive education. The conceptual structure of the research field shows a clear shift from studies focused mainly on medical or diagnostic classifications toward broader research on educational outcomes, partnership between participants in the educational process, and the professional competence of educators. The strong presence of thematic clusters related to early childhood and preschool education confirms the growing recognition of the critical importance of early inclusive interventions for the successful adaptation of children with special educational needs. At the same time, the interdisciplinary integration of research in education, psychology, and medicine creates conditions for a more comprehensive understanding of social pedagogical adaptation processes through play-based interventions. However, the identified fragmentation of research communities suggests the need to strengthen collaboration between different research groups in order to integrate empirical findings and develop more unified theoretical approaches in this field.

Future development of this research field is linked to deeper investigation of the effectiveness of play-based interventions, the creation of evidence-based practices for preparing teachers to work in inclusive educational settings, and the development of integrated models of cooperation between educational and support institutions that assist children with special educational needs. The research presented in this study is ongoing, and the results of the bibliometric analysis have provided the basis for further qualitative investigation of the most significant publications through a systematic review registered under the INPLASY Protocol (202508258, 2025).

### **Research Limitations**

The study has several limitations that should be considered when interpreting the results. First, the analysis relied on a single database, the Web of Science, which may introduce bias in representing the global research landscape. This approach tends to favour English language publications and may underestimate the contributions of research communities that publish in other languages to the development of inclusive preschool education theory and practice. Second, the bibliometric approach is based on quantitative indicators such as citation frequency and co-occurrence of terms. While this method is useful for mapping the structure of a research field, it does not allow for direct evaluation of the qualitative content of individual studies, their methodological rigour, or the practical effectiveness of play-based interventions used as social pedagogical conditions for

supporting the adaptation of preschool children with special educational needs in inclusive environments.

### **Conflict of Interest**

The authors declare no conflict of interest in this article.

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