

Inclusive Education Practices and Their Impact on Learning Outcomes of Students with Special Educational Needs

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HOW TO CITE:

Gaurav Sehgal, Ananda K. D,
Sridhar Maisa, Anupam Bansal, M.
Pandi, M.S. Kamalaveni,
Sumedha Chaudhury (2026).
Inclusive Education Practices and
Their Impact on Learning
Outcomes of Students with
Special Educational Needs.
International Journal of Special
Education, 41(14s), 419-427

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ABSTRACT:

Educational inclusion is fundamental to achieving Sustainable Development Goal 4 (SDG 4), yet children with functional difficulties continue to experience significant disparities in educational participation and learning outcomes worldwide. This study examined the relationship between educational participation and learning outcomes among children with functional difficulties using secondary data from the UNICEF Global Database on Education for Children with Disabilities. A quantitative cross-sectional research design was employed, utilizing internationally comparable data from 29 countries. Descriptive statistics, paired-sample t-tests, the Wilcoxon signed-rank test, Pearson correlation analysis, and simple linear regression were conducted to evaluate differences in educational participation and learning outcomes and to assess the predictive role of educational participation. The results revealed that children with functional difficulties had significantly lower school attendance, primary completion rates, and foundational reading and numeracy skills, while exhibiting significantly higher out-of-school rates than children without functional difficulties ($p < .001$). Correlation analysis demonstrated that educational participation was positively associated with learning outcomes, with primary completion rate showing the strongest relationship with both reading ($r = .794$, $p < .001$) and numeracy ($r = .720$, $p < .001$). Regression analysis further indicated that primary completion rate significantly predicted foundational reading ($R^2 = .631$, $p < .001$) and numeracy skills ($R^2 = .518$, $p < .001$). These findings highlight the

importance of strengthening inclusive education policies that improve school participation and educational completion among children with functional difficulties. Investing in accessible learning environments, teacher capacity building, and targeted educational support is essential for reducing educational inequalities and advancing equitable learning opportunities globally.

Keywords: educational inclusion, functional difficulties, learning outcomes, educational participation

1. Introduction

Inclusive education has been identified as a top priority on the global agenda for achieving equality of educational opportunity and has been included in the United Nations' Sustainable Development Goal 4 (SDG 4), which focuses on equitable and inclusive quality education (Tonegawa, 2022). In addition to the provision of schooling, inclusive education ensures that there are supportive learning conditions for children with diverse abilities such that they can fully engage in the learning process. Inclusive education offers equality of educational opportunity and reduces obstacles that may affect the learning and social development of marginalized communities, specifically children with disabilities (Qureshi et al., 2020).

Those with functional difficulties have faced challenges concerning access to education as well as attaining foundational skills for learning. This term refers to difficulties in areas such as vision, hearing, movement, communication, learning, and behavioral problems that might significantly impact their involvement in education (Thorneycroft, 2024). In terms of nationally representative data, it shows that children with functional difficulties still tend to be less involved in school and achieve less in education compared to other students, and family characteristics, for example, the presence of functional difficulties among parents, might contribute to development and education of children (Rahman et al., 2024; Anjum et al., 2023; Grigorenko et al., 2020).

Even though the world has increasingly been committed to inclusive education in the recent past, there still exist several issues when it comes to assessing educational inclusion in different

nations. Most of the existing evidence is generated based on single country analysis, reducing the applicability of the results in wider contexts. In addition, variation in the way disability is conceptualized, and data collection procedures make comparisons of educational performance of children with functional difficulties between countries challenging (Weedon & Lezcano-Barbero, 2021). As a result, very few research papers are using internationally comparable secondary data sets when studying educational participation and learning outcomes. The present paper aims at addressing this gap by using the UNICEF Global Database on Education for Children with Disabilities in examining educational participation and learning outcomes of children with functional difficulties.

Research Objectives

1. To compare educational participation between children with and without functional difficulties across countries.
2. To examine differences in learning outcomes between children with and without functional difficulties.
3. To assess the association between educational participation and learning outcomes among children with functional difficulties.

2. Literature Review

The importance of inclusive education as an important process in achieving equality and quality in education for all children cannot be over-emphasized. It focuses on access to education, participation, provision of necessary assistance, and enhanced learning experiences of children who have different special learning needs. Under this category, children with

functional problems should be given more focus because of disability, inadequate school facilities, poor pedagogy, and discrimination might hinder their participation and academic success. Through inclusive education, it is expected that barriers will be minimized, and children with functional problems will gain the capacity to access schools and learn basic knowledge.

Functional difficulties are limitations in areas including vision, hearing, mobility, communication, learning, memory, behavior, and self-care. Such difficulties may impact children's ability to actively engage in educational process if appropriate accommodation is lacking. For example, Anjum et al. (2023) demonstrated that functional difficulty within family environment has an impact on functioning of children. In other words, disability disadvantage not only depends on children's condition, but is determined by additional family and sociodemographic factors as well. Additionally, children with learning difficulties should be identified at an early age and receive appropriate educational help (Grigorenko et al., 2020).

Indicators for assessing learning outcomes include foundational reading skills, foundational numeracy skills, and completion rates. These indicators are relevant because they demonstrate not only participation of children in education process, but acquisition of essential skills as well. Grigorenko et al. (2020) stated that specific learning disabilities imply persistent problems with literacy and numeracy skills without appropriate educational interventions. That is why it is important to study learning outcomes of children with functional difficulties.

Educational inclusion could be assessed based on such indicators as school attendance, out-of-school rate, and completion rate. The higher these figures are, the more inclusion is, and vice versa. But it is very difficult to compare these indicators across different countries because the definition of disabilities and special educational needs varies greatly from country to country. According to Weedon and Lezcano-Barbero (2021), many special educational needs data are hard to compare across the nations because they

rely on different classifications and ways of collecting data.

The current research relies on Capability Approach, according to which education is an opportunity to enlarge real freedoms and possibilities of an individual. Thus, from this point of view, educational inclusion must include not only the availability of schools but also the capacity of children to transform educational inclusion into real accomplishments. Capability approach is a concept that emphasizes the role of freedom and well-being in social development (Dutta, 2019; Jamil, 2024). It could be particularly useful when discussing children with functional problems because equal educational opportunities may not provide equal capabilities.

However, although prior research has helped provide useful information about disability, the functioning of children, and learning problems, there are several issues. First of all, much existing literature is based only on certain countries. In turn, cross-country literature is constrained due to the presence of different ways of measuring the variables. In addition, there are not enough works that use international secondary data to analyze the educational participation and learning outcomes of children with functional difficulties.

3. Methodology

3.1 Research Design

This study employed quantitative, cross-sectional research design using secondary data analysis. A quantitative approach was appropriate because the study aimed to examine patterns of educational participation and learning outcomes among children with functional difficulties using standardized indicators. The cross-sectional design enabled the comparison of educational outcomes across multiple countries at a single point in time. This design is suitable for identifying associations among variables rather than establishing causal relationships.

3.2 Data Source

The study utilized the UNICEF Global Database on Education for Children with Disabilities, an internationally recognized secondary dataset compiled from the Multiple Indicator Cluster

Surveys (MICS) and other nationally representative household surveys. The dataset contains harmonized information on children with and without functional difficulties, including indicators related to school attendance, out-of-school status, completion rates, and foundational reading and numeracy skills. The use of this dataset facilitates reliable cross-country comparisons and supports evidence-based policy analysis (Hắc Spidartist, 2023).

3.3 Variables and Measures

The dependent variables were foundational reading skills and foundational numeracy skills, which represent children's learning outcomes. The independent variables included school attendance, out-of-school rate, and completion rate, reflecting educational inclusion. Functional difficulty status was used to distinguish children with and without functional difficulties. All variables were measured according to UNICEF's standardized definitions, ensuring consistency across participating countries.

3.4 Data Analysis

Descriptive statistics were derived to present the features of study variables. Comparative statistics were performed to look at differences in educational participation and learning outcomes between children with and without functional difficulties. The relationships between the variables were examined with Pearson correlation analysis, and the relationship between learning

outcomes and education inclusion indicators was examined using multiple linear regression. All statistical analyses were done in python and the criteria for statistical significance was set at $p < .05$.

3.5 Ethical Considerations

This is a study of secondary data publicly available from the UNICEF Global Database and did not directly involve human participants. The data is anonymised 100%, no personal data is released. Hence, no additional ethics approval and informed consent was required. The research adhered to the principles of research integrity using the data exclusively for academic purposes and the source of the original data.

4. Results

4.1 Descriptive Statistics

The descriptive statistics of the educational participation and learning outcome indicators are summarized in Table 1 for children with and without functional difficulties and the 29 countries used in the analysis. Specifically, primary attendance (86.46% vs. 82.55%), completion rate (81.00% vs. 69.00%), reading skills (43.74% vs. 33.51%), and numeracy skills (30.83% vs. 24.93%) were all higher among children without functional difficulties. On the other hand, the out-of-school rates were higher for children with functional difficulties for all educational levels, as is shown in figure 1.

Table 1. Descriptive Statistics of Educational Participation and Learning Outcomes

Variable	N	Mean	SD	Min	Max
ANAR Primary	26	82.55	14.02	38.30	97.30
ANAR Lower Secondary	23	45.30	28.97	3.80	95.40
ANAR Upper Secondary	17	27.21	23.92	0.00	73.80
OOS Primary	26	16.75	15.41	1.20	67.40
OOS Lower Secondary	23	16.13	13.02	1.00	57.50
OOS Upper Secondary	17	28.78	14.74	13.60	61.30
Completion Rate Primary	21	69.00	23.72	18.80	98.60
Reading Skill	26	33.51	20.70	3.50	77.00
Numeracy Skill	26	24.93	19.96	0.20	66.10
ANAR Primary	29	86.46	12.51	45.40	99.30
ANAR Lower Secondary	29	59.40	31.66	1.00	99.40

ANAR Upper Secondary	28	45.92	30.53	0.10	96.60
OOS Primary	29	13.27	14.09	0.80	62.10
OOS Lower Secondary	29	10.20	11.03	0.00	50.80
OOS Upper Secondary	28	18.91	13.03	0.00	54.10
Completion Rate Primary	29	81.00	21.98	25.90	100.00
Reading Skill	28	43.74	23.95	4.40	82.70
Numeracy Skill	28	30.83	21.42	0.60	72.70

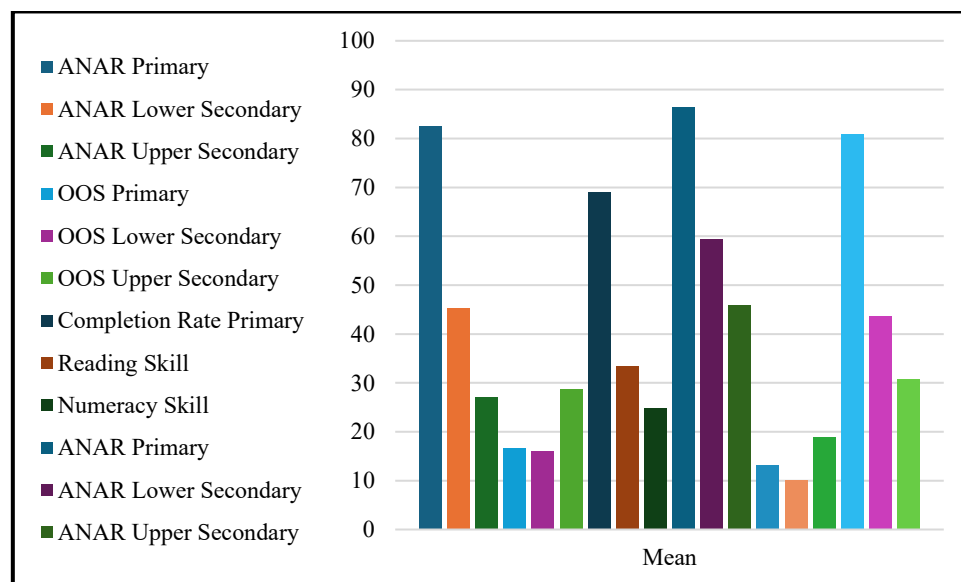


Figure 1. Mean Educational Participation and Learning Outcomes Among Children with Functional Difficulties

Figure 1 illustrates the mean values of educational participation and learning outcome indicators among children with functional difficulties. Primary school attendance recorded the highest mean, whereas foundational reading and numeracy skills remained comparatively lower, highlighting persistent disparities in educational participation and academic achievement across educational levels.

4.2 Comparison Between Children with and Without Functional Difficulties

Table 2 shows the results of paired comparisons between children with and without functional difficulties.

Table 2. Comparison of Educational Participation and Learning Outcomes

Variable	Test	Statistic	p	Effect Size
ANAR Primary	Paired t	4.213	<.001	0.826
ANAR Lower Secondary	Paired t	3.722	.001	0.776
ANAR Upper Secondary	Paired t	5.975	<.001	1.449
OOS Primary	Paired t	-4.275	<.001	-0.838
OOS Lower Secondary	Paired t	-4.260	<.001	-0.888
OOS Upper Secondary	Paired t	-5.269	<.001	-1.278
Completion Rate Primary	Paired t	5.544	<.001	1.210
Reading Skill	Wilcoxon	0.000	<.001	—
Numeracy Skill	Paired t	4.110	<.001	0.806

Statistically significant differences were seen in all the educational participation and learning indicators as presented in Table 2. Children with no functional difficulties had significantly higher attendance rates, completion rates, reading performance and numeracy performance in comparison with children with functional

difficulties. On the other hand, children with functional difficulties had significantly higher rates of out-of-school children. For some indicators, the size of the effect is large which implies that these differences are statistically significant and relevant for practical purposes.

4.3 Correlation Analysis

The Pearson correlation coefficients are presented in Table 3.

Table 3. Pearson Correlation Matrix

Variable	Reading	Numeracy
ANAR Primary	.545**	.422*
ANAR Lower Secondary	.488*	.494*
ANAR Upper Secondary	.655**	.578*
OOS Primary	-.679***	-.561**
OOS Lower Secondary	-.645**	-.556**
OOS Upper Secondary	-.434	-.462
Completion Rate	.794***	.720***

As indicated in Table 3, the indicators of educational participation were found to have positive relationships with the learning outcomes, while the indicators of out of school had negative relationships with learning outcomes. Completion rate was the most significantly related to both foundational reading skills ($r = .794$, $p < .001$) and foundational numeracy skills ($r = .720$, $p < .001$), children who finish their

primary education are more likely to have higher literacy and numeracy skills.

4.4 Regression Analysis

Simple linear regression analyses were performed to assess if primary completion rate is a predictor of children's learning outcomes with functional difficulties. Table 4 shows the regression results.

Table 4. Linear Regression Results

Dependent Variable	β	t	p	R ²	Adjusted R ²	F
Reading Skill	0.561	5.548	<.001	.631	.611	30.79
Numeracy Skill	0.427	4.398	<.001	.518	.491	19.35

As reported in Table 4, primary completion rate significantly predicted both foundational reading and numeracy skills among children with functional difficulties. The reading model explained 63.1% of the variance in reading performance ($R^2 = .631$), while the numeracy model explained 51.8% of the variance in

numeracy performance ($R^2 = .518$). The positive regression coefficients indicate that higher primary completion rates are associated with improved learning outcomes, highlighting the importance of educational participation in promoting academic achievement among children with functional difficulties.

5. Discussion

The present study explored participation and outcomes of education for children with functional difficulties, using the UNICEF Global Database on Education for Children with Disabilities. Results are always found to be that children with functional difficulties in various countries have lower rates of educational participation and learning outcomes compared to children without functional difficulties. (Oliver, 2023) The results of this research confirm the international recognition that although inclusive education is a goal in many countries, there are significant learning disparities between children with disability and those with functioning difficulties.

The first objective involved making comparisons between children with and without functional difficulties in educational participation. The adjusted net attendance rates and completion rates were significantly less for the children with functional difficulties, while the out-of-school rates were significantly higher. The results suggest that although inclusive education is being promoted, educational exclusion is still a problem that is difficult to solve. The results are in line with those found in Weedon and Lezcano-Barbero (2021), who stated that children with special educational needs still face structural inequalities in educational systems and that international comparisons show that there are still disparities in educational access. These results point to the fact that quality education is not being equitably made available for all children with functional difficulties, and that this contributes to their constrained capabilities to improve their educational potential, from the Capability Approach perspective (Dutta, 2019; Jamil, 2024).

The second goal investigated the differences in learning outcomes. Children with functional difficulties had significantly poorer foundational reading and numeracy skills than children without functional difficulties. The results are consistent with earlier studies that suggest that lack of educational support could negatively impact literacy and numeracy skills in the presence of

learning disabilities and functional limitations (Grigorenko et al., 2020). Previous studies have found that teacher support, motivation, parental monitoring, and self-efficacy are all factors that affect academic performance (Affuso et al., 2023). The variables were not directly measured in the present study, but they may partly account for the fact that countries with better educational systems perform better on children's learning outcomes for children with functional difficulties.

The following correlation and regression analyses also confirmed the relationship among the educational participation and the learning outcomes. The relationship between primary completion and foundational reading and numeracy skills was positive and the strongest was found for children with functional difficulties, and primary completion significantly predicted academic achievement for these children. In particular, the regression models showed that the completion rate accounted for 63.1% of the variance in reading skills and 51.8% of the variance in numeracy skills. The results indicate that keeping children with functional problems in school until they get through primary school makes a significant contribution to the development of basic academic skills. This finding is also supported by other studies which have shown that educational persistence is one of the strongest predictors of subsequent academic success and reduced dropout risk (Kocsis & Molnár, 2025; Al Husaini & Shukor, 2022).

The results also have implications for inclusive education practice. The importance of culturally responsive pedagogies and individual instructional support in inclusive classrooms has been highlighted in previous studies (O'Leary et al., 2020). Similarly, AT can have a profound impact in enabling learning participation and educational independence for students with disabilities, by minimizing barriers to learning and communication (Bennett et al., 2018; McNicholl et al., 2021). While the UNICEF data captures neither directly these school-level practices, nor was there an explicit focus on educating children who drop out, the correlation between educational participation and learning outcomes provides a rationale for support for effective

instruction in schools to complement this focus on sustained attendance to learning.

Last, the current results underline the need to enhance education systems to achieve SDG 4. Inclusive education is not about increasing the number of children in the school, but about setting up learning environments that enable children with functional difficulties to play and learn successfully and to reach the educational goals. This objective is dependent on the preparedness of the teacher, availability of learning environments, availability of suitable learning tools and supportive school policies. At the same time, inclusive education can also be a burden on teachers' professional workload and job stress if they don't have adequate institutional support (Weiss et al., 2021). Adults' investment in teacher professional development, inclusive pedagogy, assistive technology, and educational support service is, therefore, necessary to enhance educational participation and learning outcomes of children with functional difficulties. Together these results provide a further endorsement of the Capability Approach, showing that better educational opportunities for children with functional difficulties and successful participation in education have a significant impact on both children's capabilities and their achievement.

6. Conclusion

The study examined children's participation in education and learning outcomes using the UNICEF Global Database on Education for Children with Disabilities, for those with functional difficulties. Persistent inequalities in

educational access and achievement were found in that children with functional difficulties consistently showed lower school attendance, lower primary completion rates, higher out-of-school rates and poorer foundational reading and numeracy skills than children without functional difficulties. Moreover, participation in education was positively linked to learning outcomes, with education completion at primary level being a significant predictor of both competencies in reading and numeracy. These findings highlight the need to make sure that children with functional difficulties can be reached and that they stay engaged in education throughout primary school and through successful academic achievement. The study also contributes to literature, with the collection of internationally comparable evidence from several countries, thus enhancing the understanding of educational inclusion based on the Capability Approach. The findings from a policy perspective highlight the importance of the governments and the education stakeholders to promote inclusive education by enhancing school accessibility, access to some specific support services, the professional development of teachers, and access to assistive technologies for providing equitable learning opportunities. The focus on cross section secondary data and the lack of school-level data on how instruction is delivered means this study has limited applicability, but it provides valuable information for policymakers and educators who wish to close educational gaps and to advance the UN Sustainable Development Goal 4 on providing inclusive and equitable education.

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