

Development of a Play-based Instructional Approach in Teaching Children with Special Needs

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Abstract This study aimed to develop and initially implement a play-based instructional approach for selected children with special needs. The instructional materials were designed and developed using the ADDIE Model and analyzed using a descriptive-exploratory research design. The study developed play-based instructional materials for children with special needs, such as autism, intellectual disability, and hearing impairment, using the ADDIE model. The materials were designed to address the challenges children with special needs faced, and the ROSGUMRA play-based approach was used in the design phase. Three play-based instructional materials were developed, namely Hanger and Clothespins Addition Machine Pin It Game, Spin the Wheel, and Spindle Box, and were implemented and evaluated in an exploratory phase. The play-based instructional materials developed using the ADDIE model and the ROSGUMRA play-based approach effectively enhanced the mathematical, communication, motor, and socio-emotional skills. The study recommended various actions for different stakeholders. Teachers were advised to use play-based instructional materials to enhance the mathematical skills and cognitive abilities of children with special needs, particularly those with intellectual disabilities, autism, and hearing impairments. Parents were encouraged to use play-based materials at home to improve their child's learning behaviors while collaborating with educators to find suitable materials that align with their child's needs and interests. Future researchers were recommended to use the ADDIE model as a guide for developing and exploring the effectiveness of various play-based instructional materials. Lastly, policymakers were advised to incorporate play-based instructional materials into special education programs and support the development of structured and routine-based materials that cater to children's interests and preferences.

Keywords: *Play-based Instructional Approach, Children with Special Needs, Development, Teaching, Instructional Materials*

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Introduction

The education of learners with special needs in the Philippines has come a long way, from special education (SPED) to integrated education and now to inclusive education. Despite various policies and programs to accelerate this shift toward inclusive education, many obstacles, barriers, and challenges remain. In the Philippines, 5.1 million children are living with disabilities, with 26.56% of them being poor. [1] The Philippine Constitution guarantees the right of all citizens to quality education, including persons with disabilities or students with special needs. [2] The Magna Carta for disabled persons was enacted to ensure the self-development and self-reliance of disabled individuals or students with special needs, which later shifted to

inclusive education in the country's educational system. [3] The Inclusive Education Act ensures that learners with disabilities can access free public early and basic education services and creates Inclusive Learning Resource Centers in the country. [4] The SPED program has become imperative for responding to the growing number of students with special needs who lack access to quality inclusive education. The commitment of the Philippines to the United Nations Convention on the Rights of Persons with Disabilities pushed the government through the Department of Education (DepEd) to shift the current educational system of SPED into an inclusive education system. [5]

However, due to a lack of funding and support, the SPED centers, specifically the teachers, experienced various problems, such as the availability of facilities and instructional materials essential to teaching children with special needs. Instructional materials are vital tools for

learning content and skills. It allows the students to interact with words, symbols, and ideas in ways that develop their abilities in reading, listening, solving, viewing, thinking, speaking, writing, and using media and technology. It also played a very important role in the teaching-learning processes, which included enhancement of the memory level of the students, facilitating the teaching-learning process, improving the student rate of accumulation, serving as a tool used by the teachers to correct wrong impressions, and illustrate things that learners cannot forget easily, and assisting in giving a sense of reality to the body of knowledge under discussions.

In view of the foregoing, this study aims to develop instructional materials utilizing a play-based approach for children with special needs in Daraga North Central School, Daraga North District, Albay. The study will benefit school administrators and school heads in implementing the SPED program in their respective schools. Also, the study will provide an idea of using a play-based instructional approach when teaching children with special needs. Furthermore, the current study can serve as a basis for policy formulation and funding support for utilizing instructional materials and other learning resource materials for teaching children with special needs.

Objectives of the Study

This study aimed to develop and initially implement instructional materials utilizing a play-based approach for children with special needs such as autism, intellectual disability, and hearing impairment.

Materials and Methods

The study utilized a descriptive-exploratory research design. The researchers conducted a pre-assessment phase to determine the competencies that need to be addressed and to analyze the children's learning behaviors. Based on the results, instructional materials were designed and developed using the ADDIE Model and criteria set by

DepEd LRMS. SPED experts validated the developed materials, which were later implemented in an exploratory phase where children with special needs used them for seven days. Learning behaviors were recorded using a behavioral checklist and field notes, and focus group discussions were conducted to transcribe and categorize responses according to themes and codes.

Data Analysis Techniques

The study used various data analysis techniques to interpret the findings. A weighted mean was used to determine the level of validity of the play-based instructional materials. Cronbach Alpha was used to measure the reliability of the validation tool. Pre-experimental (one-shot case analysis) was employed to evaluate the learning behavior of the children with special needs in response to the play-based instructional approach. The post-test behavioral checklist was analyzed using a weighted mean. Also, inductive coding for thematic data analysis was used in the study. The inductive approach aims to condense extensive and varied raw text data into a brief summary format, establish clear links between research objectives and summary findings, and develop a model or theory about the underlying structure of experiences or processes evident in the raw data.

Results and Discussion

The researchers developed play-based instructional materials for selected children with special needs such as intellectual disability, autism, and hearing impairment. The Analyze, Design, Develop, Implement, and Evaluate (ADDIE) model was used to develop play-based instructional materials. In the analysis phase, it was identified that the children with special needs have very poor performance or low mastery, along with adding quantities up to 20 using concrete objects. Their mastery level was determined using a pre-test. [Table 1](#) below is the result of the pre-test.

Table 1. Mastery Level of Children with Special Needs in Mathematics

Learning Competencies	Children with Special Needs			Mean Score	PR	PL
	Autism	Intellectual Disability	Hearing Impaired			
Illustrates addition as "putting together or combining or joining sets" (TP_MFP-fo-NG-1)	4	3	2	3.00	60.00	F
Identify the plus (+) sign that indicates the act of adding whole numbers (TP_MFP-fo-NG-2)	4	3	3	3.33	66.67	F
Add quantities up to 20 using concrete objects (TP_MFP-fo-NG-3)	1	0	1	0.33	33.00	VP

Legend:

Performance Rating (PR)	Performance Level	Symbol
89.50-100	Excellent	E
79.50-89.49	Very good	VG
69.50-79.49	Good	G
59.50-69.49	Fair	F
49.50-59.49	Poor	P
49.49 and below	Very poor	VP

[Table 1](#) shows the performance level of children with special needs. It can be gleaned from the data presented

that in the first learning competency, which illustrates addition as "putting together" or combining or joining sets,

the students got a mean score of 3.00 with a performance rating of 60.00%, interpreted as fair. For the second learning competency, identifying the plus (+) sign that indicates the act of adding, the students got a mean score of 3.33 with a performance rating of 66.67, interpreted as fair. Lastly, for the third learning competency, adding quantities up to 20 using concrete objects, the students got a mean score of 0.33 with a performance rating of 33.00%, interpreted as very poor. Hence, children with special needs have varying performance levels in the different learning competencies presented.

Moreover, it was observed that the children with autism exhibited restrictive and repetitive behaviors, interests, or activities, often associated with routine and structure preferences. The students experienced cognitive difficulties, such as problem-solving, organization, and time management. They also experienced cognitive functions and ability limitations, such as communication, social, and self-care skills. These limitations caused the children to develop and learn more slowly or differently than normally developing children. To address these challenges, play-based instructional materials were developed. The material should be designed with a structured and routine-based approach that gives the children a sense of predictability and familiarity. It incorporated the students' interests and preferences to keep them engaged in learning.

In the design phase, the instructional materials were designed using the ROSGUMRA play-based approach, hands-on interactive activities that allow students to learn through play. The materials include Hanger and Clothespins Addition Machine Pin It Game, Spin the Wheel, and Spindle Box, which involve interactive activities that encourage students to learn through play. These activities align with the ROSGUMRA play-based approach, which emphasized hands-on learning experiences, self-directed learning, and the development of critical thinking skills, as well as sensory-based activities that create an engaging and stimulating learning environment.

In the developing phase, the development stage of the ADDIE model, the instructional materials are created based on the analysis of the learning needs and the design of the play-based instructional material in relation to the ROSGUMRA play-based model. In this study, the researchers developed three instructional materials, namely: (1) Hanger and Clothespins Addition Machine Pin It Game, (2) Spin the Wheel, and (3) Spindle Box. These materials were designed to enhance the pupils' mathematical skills, specifically in adding numbers, and to improve their cognitive ability, communication, motor, and socio-emotional skills.

The first play-based instructional material is "The Hanger and Clothespins Addition Machine Pin It Game." This engaging activity allows pupils to count the number of objects in the dice and represent them using clothespins. This activity enables pupils to use their motor skills in pinning the clothespins to the coat hanger while improving their mathematical skills in adding numbers.

The second play-based instructional material is "Spin the Wheel." This is another game that enhances pupils' mathematical abilities. It requires the students to spin the wheel twice and write the first and second numbers on the

board. The pupils then use the counter to add the number combinations and give the answer. This activity enables pupils to practice their addition skills using their motor and cognitive abilities.

Lastly is the Spindle box, a sensory-based activity that encourages pupils to use their tactile senses to learn numbers. This activity involves feeling the spindle box and pointing to the numbers written on it while introducing numerals 1-10. This activity improves pupils' cognitive and motor skills while enhancing their numerical understanding.

In the implementation phase, the participants were observed using the developed play-based instructional materials. In the case of the pupil with autism, the researcher asked the pupil to spin the wheel twice, add the numbers, and give the correct answer using the counter. The researcher observed the pupil's performance and noted the child's mastery of the concept.

Table 2. The Developed Play-based Instructional Materials for Children with Special Needs

Children withSpecial Needs	Indicators				Alpha	
	Content	Instructional Design			Score	Interpretation
	Mean	DR	Mean	DR		
Hanger andClothespins Addition Machine PinIt Game!	3.60	VS	3.50	VS	0.85	VR
Spin theWheel	3.80	VS	3.75	VS	0.93	VR
Spindle Box	3.60	VS	3.50	VS	0.85	VR

Legend:

For Content and Instructional Design

Numerical Score	Descriptive Rating	Symbol
3.50-4.00	Very Satisfactory	VS
2.50-3.49	Satisfactory	S
1.50-2.49	Poor	P
1.00-1.49	Not Satisfactory	NS

Similarly, for the pupil with an intellectual disability, the researcher introduced the Hanger and Clothespins Addition Machine Pin It Game, which the pupil found engaging because of the colorful and large-sized dice. The pupil initially had difficulty pinning the clothespins, but with more practice, the pupil showed mastery of addition in the game. Furthermore, the pupil with a hearing impairment was introduced to the instructional materials using number flashcards and played the Spindle Box game. In the evaluation, it was observed that the pupil showed good mastery of addition. All of the instructional materials developed for enhancing mathematical skills and cognitive abilities were rated as very satisfactory by the users. The materials were evaluated based on content, instructional design, and reliability. (See [Table 2](#))

Conclusion and Recommendations

The use of play-based instructional materials developed using the ADDIE model and the ROSGUMRA play-based approach effectively enhanced the mathematical skills and learning behaviors of children with special needs such as

intellectual disability, autism, and hearing impairment. The instructional materials were engaging, easy to use, and effective in enhancing the pupils' mathematical, cognitive, communication, motor, and socio-emotional skills. Based on the conclusion, the following recommendations were drawn:

For Teachers. Play-based instructional materials can be a valuable tool for enhancing the mathematical skills and cognitive abilities of children with special needs. Teachers should consider using play-based materials in their teaching approach.

For Parents. Parents of children with special needs can consider using play-based instructional materials at home to enhance their child's learning behaviors. They can work with educators to identify appropriate materials and activities that align with their child's needs and interests.

For Future Researchers. The use of the Analyze, Design, Develop, Implement, and Evaluate (ADDIE) model in the development of play-based instructional materials can serve as a guide for future research on this topic. Researchers can build upon this study by exploring the effectiveness of different types of play-based materials and activities for enhancing the learning behaviors of children with special needs.

For Policymakers. Policymakers can consider incorporating play-based instructional materials into special education programs to enhance the mathematical skills and cognitive abilities of children with special needs. They can also support the development of materials that are designed with a structured and routine-based approach while also incorporating the interests and preferences of the children.

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