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EFFECT OF VISUAL STRATEGIES ON THE DEVELOPMENT OF RECEPTIVE LANGUAGE SKILLS IN CHILDREN WITH AUTISM

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Introduction:

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by pervasive deficits in social interaction and communication, as well as the presence of rigid and/or repetitive behaviors or sensory concerns that impact the individual's functioning and development. Individuals with this disorder may experience symptoms with or without intellectual or language impairment The term "spectrum" is used to capture the wide array of symptomology seen across age and developmental levels (American Psychiatric Association, 2013) . The spectrum nature of the disorder means that it affects individuals in varying degrees; some may have significant cognitive and verbal difficulties, while others might possess average or above-average intelligence with subtler communication challenges. Common traits include difficulties in understanding social cues, an intense focus on specific interests, and a preference for routine or predictability. The exact cause of autism remains unknown, but it is believed to involve a combination of genetic and environmental factors. Early diagnosis and intervention can be crucial in helping individuals with autism develop skills and strategies to navigate the world around them. While there is no cure for autism, many people with ASD lead fulfilling lives, contributing to society in unique and meaningful ways.

Individuals with autism may face challenges in social communication, including difficulties in understanding and using nonverbal cues, maintaining eye contact, and participating in reciprocal conversations. They may also exhibit repetitive behaviors, have restricted interests, and prefer routine and predictability. Children with autism typically demonstrate three main areas of impairment: difficulties in language and communication, challenges in social interaction, and engaging in restrictive and repetitive behaviors and interests. Sensory sensitivities, such as being hypersensitive or hyposensitive to specific sounds, textures, or lights, are common among individuals with autism.

Autism typically becomes apparent during early childhood, and early identification and intervention are crucial for optimal outcomes. The exact causes of autism are still not fully understood, but it is believed to result from a combination of genetic and environmental factors.

It's important to note that individuals with autism possess unique strengths and talents, and their experiences can vary widely. Some individuals with autism may excel in areas such as mathematics, music, or visual thinking. With appropriate support, interventions, and accommodations, individuals with

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autism can lead fulfilling and meaningful lives, make progress in their development, and actively participate in society.

Language is a combination of expressive and receptive communication skills, including the ability to speak, listen, read and write (Mazibuko & Chimbari, 2020). Language and communication is a deficit area in children with autism. This domain consists of 2 parts - receptive and expressive language. However, receptive language development precedes language production and ultimately launches expressive abilities, thus building the foundation for the development of literacy (Muller & Brady, 2016).

According to the Macmillian dictionary, receptive language skills are defined as: "the skills of being able to understand a language when you listen to it or read ot. Listening and reading are considered to be receptive skills."

For the purpose of the study the researcher has operationally defined Receptive Language skills as "the ability to understand and comprehend spoken language that one hears or reads. A student's ability to listen and follow directions relies on his/her receptive language skills. Students who have impairments in receptive language skills may have trouble in one or more of the following:

(i) following instructions
(ii) understanding what gestures mean
(iii) answering simple questions verbally or through gestures
(iv) identifying objects and pictures (v)Reading comprehension
(v) understanding a story. Students with autism typically exhibit these symptoms".

Most of the autism children have better visual memory than auditory memory. Autism children are able to understand and remember more through visual learning or visual thinking, by visual learning they tend to be easily concentrate and understand such learning. The use of media with visual strategy can possibly be implemented in teaching the communication ability (Aldred et al., 2004)

A combination of visual strategies can be utilized like teaching through gestures, flash cards (objects, body parts, alphabets, numbers, words), story cards to facilitate the receptive language skills in the children. To teach eye contact and attention the children can be engaged with the use of colourful objects, gestures and flash cards and to teach imitation skills, the children can be taught to imitate actions of the teacher with the help of objects and music.

Visual strategies can be frequently used in working with individuals with autism. They serve as a versatile tool to support various aspects of learning and development. One key application is in vocabulary development. By presenting a visual image or word on one side and the corresponding word or definition on the other, visual strategies help individuals with autism improve their receptive language and expressive language. The strategies help them understand what the person teaching them is telling them as it adds an image to the words making it easier for them to understand. These strategies help them expand their vocabulary and improve word recognition. This method promotes language and communication skills by providing a concrete visual representation of concepts, aiding in comprehension and expression.

In addition to vocabulary, these visual strategies can be used to teach and reinforce other important skills. For instance, they can be utilized to teach numbers, colors, shapes, or even social skills such as emotions or social cues. The strategies allow for repetition and practice, which can enhance learning and memory retention for individuals with autism who often benefit from structured and consistent reinforcement.

It's important to note that when using visual strategies for individuals with autism, it's essential to consider their specific learning style, preferences, and individual

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needs. Some individuals may respond better to certain types of visuals, such as photographs or symbols, while others may prefer drawings or written words. Adapting and personalizing the flashcards to the individual's unique profile will enhance their effectiveness and engagement.

Inclusive education programs can be broadly defined as those which accommodate all learners in a mainstream classroom. In 2017, UNESCO defined inclusion as the process of overcoming the barriers limiting the participation of all learners. Their report states that any difficulties experienced by students in their learning process are due to the education system, including the methods of teaching, and the environments provided to support all students (Meindl et al., 2020). Visual strategies can be used to develop receptive language skills in children with autism which is necessary for communication with other peers to facilitate learning in inclusive schools. It is therefore important to assess if these visual strategies are effective in development of receptive language to facilitate the inclusion of children with autism in mainstream schools.

Research Question:

Are visual strategies effective in the development of "receptive language skills" in children with autism?

Objectives:

Objectives of the research are as follows:

1. To determine the effectiveness of visual strategies on the pre-test and post-test scores on the receptive language skills of children with autism.

Hypothesis :

The following null hypothesis was formulated for the research

Hypothesis:

There is no significant difference in the pre-test and post-test scores of the on the effectiveness of visual strategies on the receptive language skills of children with autism.

Methodology:

The design used in the study was the quasi-pretest posttest group design. The effect of the intervention was seen in the group of children with a definite diagnosis of autism. Pre-test scores were taken before intervention was provided and after 12 sessions of intervention with visual strategies

Sampling:

The intervention was done on 15 children with autism aged between 3 to 8 years of age. The sampling was purposive. All children have a definite diagnosis of autism and are attending a special school. The students selected for the intervention were from 1 school in the suburbs that fulfilled the age and diagnostic criteria. 12 sessions of intervention were done.

Intervention:

A combination of visual strategies was created including gestures, flash cards (objects, body parts, alphabets, numbers, words), story cards to facilitate the receptive language skills in the children. Initially, the child had to be taught to understand the instructions given by the teacher. This had to be done through use of all the visual strategies and gradually success was achieved when the child started responding well to instructions and complying with the instructions given by the teacher.

Flash cards used for the study are as follows:

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Story sequencing cards:

To teach comprehension of stories, story sequencing cards were created. Each card had one sentence of the story to make it easy for child to understand. The child was taught with the cards in sequence and once mastery was achieved, the child was asked to answer simple questions based on the story which were as follows:

a. Who was the main character of the story? (Can be answered by pointing if the child is non-verbal)
b. What is the crow feeling?
c. How does he raise the water level in the urn to be able to drink the water?

The child was also asked to place the cards in the sequence the story is supposed to be taught. Once child masters that and story is taught, the above questions are asked and anwers are again recorded as per the prompt level of the response.

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Procedure for data collection:

The procedure of data collection for the research study was done as follows (1) Baseline assessment of the group (sample: 15). assessment was done on receptive language skills of the children which included "Attention" skills", "Imitation skills", Identifying objects and pictures", "Comprehension" and "Identifying a story" by the children. (2) Intervention given to the group with the various visual strategies prepared for each child (12 sessions for each child). (3) Post-intervention assessment of the group (sample: 15). (4) Collation and coding of scores in Excel sheet.

Scoring:

The children are given a chance to respond with 4 prompt levels to the instruction with the visual strategies. The instruction starts with a Physical prompt (P) where the teacher physically guides the child through the actions. The Physical prompt gradually fades and moves to a correct prompt where the child can perform the actions independently with a correct prompt (C). Four prompt levels were recorded depending on the independence level of the child which are as follows: (a) Physical prompt (P) where the child chooses with complete manual guidance from the teacher and the score given was 1, (b) gestural prompt(G) where the child chooses when the instruction is given the second time and the score given was 2, (c) when the teacher repeats the instruction and the child chooses correctly, the score given was 3, and (d) Correct prompt where the child chooses independently and the score given was 4.

Data Analysis:

The data was analyzed quantitatively and qualitatively. Descriptive statistics providing a summary of the main features of the dataset were created. Inferential Statistics: Inferential statistics are used to make inferences about a population based on a sample of data. As the sample size was small, the sampling was purposive, and data was not distributed normally, non-parametric testing of the hypothesis was done. The statistic used was the Wilcoxon Signed Rank test for comparison of pre-test and post-test scores. Once the statistical analyses were performed, the results were interpreted in the context of the hypotheses.

Analysis of data:

Descriptive Statistics:

Descriptive measures of central tendency of the data were derived. The mean, median and mode were calculated for the group. Pre-test and post-test score measures were calculated to evaluate if the difference is significant

Table 1

Descriptive data analysis of the pre-test and post-test scores of the group

Variable	Score	N	Mean	Median	Mode	SD	Skewness	Kurtosis
Receptive Language	Pre-test	15	31.8	31	31.0	1.26	1.65	1.98
	Post-test	15	64.9	61	65.0	16.7	1.06	1.73

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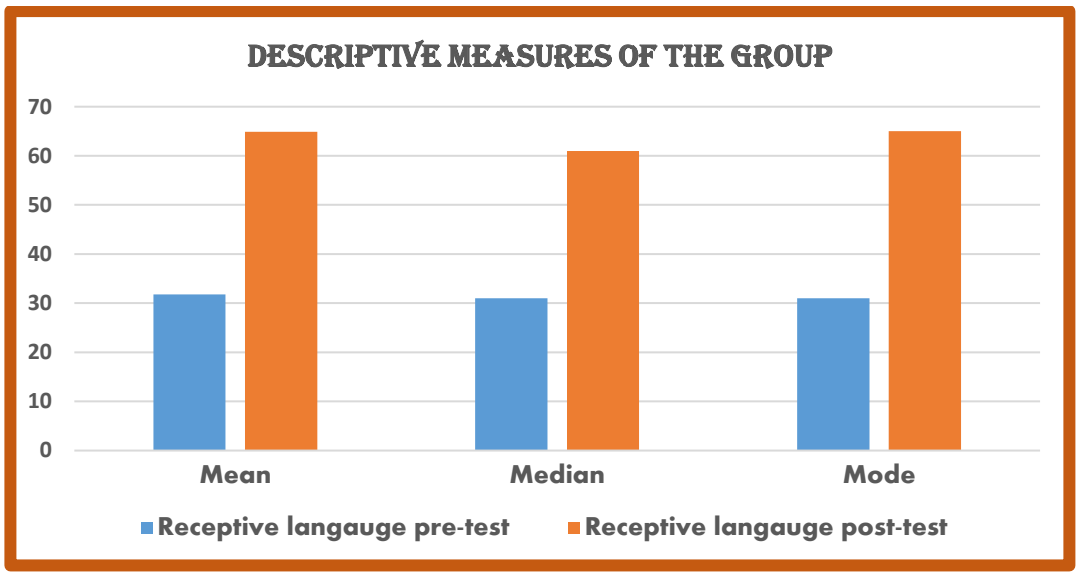

Graphical representation of descriptive measures of group

Figure 1

Interpretation:

The mean, median, and mode of the post-test scores of the group are 64.9, 61 and 65 which are close to each other. They are much higher than the mean, median and mode scores of the pretest scores of the group which are close to 31. This shows that the intervention has been significant in this group. The Standard deviation of the pretest score of the group is 1.26 and post-test core is 16.7. The data is positively skewed and is platykurtic.

Inferential Statistics:

Testing of hypothesis 1

Null Hypothesis H0: There is no significant difference in the pre-test and post-test scores of the effectiveness of visual strategies on the receptive language skills of children with autism

Table 2

Relevant statistics for the pre-test and post-test scores of the group of receptive language using Visual Strategies with the Wilcoxon signed rank test

Parameter	P-value	Effect size	Z value	Significance	Hypothesis
Receptive language	0.00007247	0.8727	3.3801	Significant	Rejected

Interpretation:

Results of the Wilcoxon Signed-Rank test showed there was a significant difference (Z = 3.4, p<0.001) between the pre-test and post-test scores. The median post-test rank (*Mdn* = 61, *n* = 15) for Receptive Language is statistically significantly higher than the pre-test ranks (*Mdn* = 31, *n* = 15). The effect size, r = 0.9 is the intervention effect and is interpreted as a large effect, according to Cohen's classification of effect sizes which is 0.1 (small effect), 0.3 (moderate effect), and 0.5 and above (large effect). The p-value is l

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0.00007247 which is less than 0.05 and therefore the results are significant.

Hence, the null hypothesis is rejected & alternative hypothesis is accepted.

Alternative Hypothesis (HA):

There is a significant difference in the pre-test and post-test scores of the effectiveness of visual strategies on the receptive language of children with autism.

Conclusion:

As **t**here is a significant difference between the pre-test scores and the post-test scores of the selected group on the receptive language of the children with autism due to the use of visual strategies, the intervention was successful.

Conclusion:

The intervention using visual strategies was successful. there was an improvement in the receptive language skills of the children after training with the visual strategies created for the study over several sessions. The outcome of this intervention is that children can show an improvement in receptive language skills using visual strategies. This is important for them to function effectively in inclusive education schools and in society. More research is required in this area, which could strengthen this outcome.

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