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**The Effectiveness of Training Program Derived
from VB-MAPP in Developing Language
Skills among Children with ASD**

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Abstract

The study aimed to evaluate the efficacy of the VB-MAPP program for enhancing language skills (expressive and receptive language) and academic skills among children with ASD. Finding out how much the program still works to help autistic children with their language skills after two months of participation. The study adopted the quasi-experimental method with pre-post-follow-up measurements to achieve the mentioned objectives. A total of 20 children made up the study sample were selected in an accessible way that met the conditions of the children of the Lubbaik Center in Jeddah. The study showed that there are statistically significant differences in favor of the post-measurement in language skills (expressive and receptive language) before and after the program's implementation. Additionally, the language skills (expressive and receptive language) in the post-test and follow-up assessments show no statistically significant alterations.

Keywords: VB-MAPP program, (expressive and receptive language), ASD

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فاعلية برنامج تدريبي مستمد من VB-MAPP في تنمية المهارات اللغوية لدى الأطفال ذوي اضطراب طيف التوحد

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مستخلص الدراسة

هدفت الدراسة إلى تقييم فاعلية برنامج تدريبي مستمد على (VB-MAPP) في تطوير المهارات اللغوية (اللغة التعبيرية والاستقبالية) والمهارات الأكاديمية لدى الأطفال ذوي اضطراب طيف التوحد، ومعرفة مدى استمرار أثر هذا البرنامج في مساعدة الأطفال ذوي اضطراب طيف التوحد على تحسين مهاراتهم اللغوية بعد شهرين من المشاركة، واعتمدت الدراسة المنهج شبه التجريبي مع قياسات قبل وبعد التدريب والمتابعة لتحقيق الأهداف المذكورة. وبلغ إجمالي عينة الدراسة (٢٠) طفلاً تم اختيارهم بطريقة قصدية من مركز لبيك بجدة.

أشارت الدراسة إلى وجود فروق ذات دلالة إحصائية لصالح القياس البعدي في المهارات اللغوية عند تطبيق البرنامج. كما أظهرت نتائج هذه الدراسة عدم وجود فروق ذات دلالة إحصائية بين الاختبارات البعدية واختبار المتابعة.

الكلمات المفتاحية: برنامج VB-MAPP، المهارات اللغوية، اللغة التعبيرية والاستقبالية، اضطراب طيف التوحد.

Introduction:

Autism Spectrum Disorder (ASD) is one of the neurodevelopmental disorders that appear in children from birth until the age of (8) years (Artoni et al., 2018). This disorder is characterized by impairments in social communication, including impairments in both verbal and nonverbal communication aspects, which in turn affect social interaction (Asaro-Saddler, 2016). ASD is also characterized by repetitive, purposeless, stereotyped behaviors (Botha, Hanlon & Williams, 2021). For the best development of individuals with ASD, appropriate support services must be provided in early childhood. Therefore, researchers in the field of ASD have provided many training programs to improve the educational and communication skills of autistic child. Behavioral intervention is the best way to teach autistic child (Botha et al., 2021).

As one of the early intervention programs for autistic children, the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP) appeared (Partington, Bailey & Partington, 2018). It is a criterion-referenced assessment curriculum guide and skills-tracking system designed specifically for children with ASD and other individuals who demonstrate language disorders. The VB-MAPP is developmentally based and field tested with typically developing children and children with autism. It combines principles of ABA and Skinner's analysis of verbal behavior (VBA) providing a behaviorally based language assessment program for all children with language disorders (Fahmy, 2022).

The concept of ASD is perhaps best presented and most accepted in the field, as witnessed by the successive change associated with this category in the Fifth Statistical and Diagnostic Manual of the American Psychological

Association (APA) (APA, 2013). The Fifth Statistical and Diagnostic Manual presented a new conception of ASD in terms of concept, definition, categories, and diagnostic criteria. This category was placed within the category of neurodevelopmental disorders, and the subdivisions that existed in (DSM-4-TR), which included five categories within PDDs, were abolished and replaced with one category, which is an ASD (Vanegas, 2019). The fourth statistical and diagnostic manual defines ASD as a developmental disability and a specific deficiency that appears in three basic developmental areas: social interaction, verbal and nonverbal communication, behavioral patterns, interests, and repetitive and stereotypical activities that must appear before the age of three (Below, Spaeth & Horlin, 2021). The fifth statistical and diagnostic manual defines ASD as a neurodevelopmental disorder characterized by poor social interaction, verbal and nonverbal communication, and restricted and repetitive behavioral patterns (Waddington & Reed, 2017).

Children usually develop ASD before the age of three, as it affects speech, behavior and interaction with others (Uzuegbunam, Wong, Cheung & Ruble, 2018). Among the symptoms that the family should notice: the child completing the first year of his life without trying to speak or using the sign such as waving the hand, and the child reaching the age of one and a half years without producing a single word (Tran, Pham, Mai, Le, & Nguyen, 2020). The child reaches two years without producing two-word sentences, not just repeating what he hears, and the child at any age loses the language skills or social skills that he previously possessed (Uzuegbunam et al., 2018). The CDC has identified some indicators that can contribute to diagnosing a child with ASD at the age of two years, through parents'

observation of the early indicators that appear on the child before he reaches the first year of his life, and noting the difference between him and his peers up to the age of (18) months (Tran et al., 2020).

Indicators of autism for children under the age of (18) months focus on the special developmental requirements of communication (Tran & Weiss, 2018). Failure to meet these requirements indicates a problem. Among these indicators is that the child does not care about looking at the faces around him, lacks eye contact, does not smile, and sometimes you may feel that he is looking into space, does not use gestures to express joy or anger, and others (Stark & Lindo, 2022). Special educators, SLPs, and researchers in the field of ASD have provided many programs and instruction to improve the language and communication skills of autistic children, including the assessment program for basic language skills (Stadnick et al., 2019). The **VB-MAPP** is one of the most important field programs in the rehabilitation of autistic children (Laribi, 2022). The *Verbal Behavior Milestones Assessment and Placement Program* (VB-MAPP) is a five-component program designed to measure verbal behavior, guide individualized instruction needed to address deficits in verbal behavior and evaluate progress over the course of a treatment program (Sundberg, 2008).

There was a need to provide a training program for autistic children aimed at providing them with skills that contribute to achieving their independence and evaluating language and communication skills to train autistic children on acquiring the skills mand, tact, listening, social, intraverbals, classroom/group routines, and linguistic skills (Usry, 2015).

The *VB-MAPP* is a tool that can be used in a variety of settings with any number of children with communication disorders (Sundberg, 2008).

Many educational settings use the instrument to establish language goals and objectives for individuals with autism spectrum disorder and other developmental disabilities. This is as well as providing a theoretical framework for basic language skills and their importance for autistic children. The current study seeks to develop some of these skills in a sample of autistic children, which would develop more complex skills, thus contributing to their integration into society.

Research Questions

The following questions are tried to be addressed by the current study:

- 1- Are there differences between the average performance of the study members in the pre and post-measurements on skills of levels 1 and 2 (visual performance, imitation, mand, and social behavior), and academic skills of level 3 (pre-reading, reading, writing, and intraverbal) attributable to training on the VB-MAPP program?
- 2- Is there a statistically significant effect of the VB-MAPP program in improving the basic skills in the follow-up measurement skills of levels 1 and 2 (visual performance, imitation, mand, and social behavior), and skills of level 3 (pre-reading, reading, writing, and intraverbal) among autistic children?

Literature Review

This section deals with the theoretical framework with its three axes, which include ASD, language, and learning skills, in addition to the VB-MAPP program.

Autism Spectrum Disorder (ASD)

Attention to ASD has become a necessity due to its rapid spread among children all over the world. People are also more interested in doing scientific studies and research to learn more about ASD, its causes, and how to accurately diagnose it (Dyer, 2022). This is because ASD affects a child's ability to communicate and interact with the outside world, as well as his ability to find appropriate and effective treatments to improve their life (Hillier et al., 2018). Due to the wide range of types of individuals affected by this condition and their diverse talents and capabilities, ASD is said to be among the most difficult developmental disorders (Holmes, 2022). Although they share certain fundamental traits, the symptoms, and traits that signify ASD manifest in a variety of overlapping patterns that range in severity from mild to severe (Simón, Martínez-Rico, McWilliam & Cañadas, 2022) . Additionally, social, linguistic, and behavioral elements of the individual are impacted by the autism spectrum condition.

There are many definitions of ASD as one of the developmental disorders that occur in childhood. The Diagnostic and Statistical Manual IV (DSM-IV) indicates that ASD is a neurodevelopmental disorder whose main features are abnormal development or impairment in social interaction and communication, and restricted and repetitive activities (Simón et al., 2022). Hillier et al. (2018) define it as a developmental disability that the child loses social interaction, verbal and nonverbal communication with others, and this is accompanied by a lack of visual contact, and repetitive movements. Holmes (2022) mentioned that ASD is one of the severe developmental disorders that include all developmental aspects of the child and including problems in the verbal and non-verbal communication process, problems in

social interaction, and the presence of patterns of stereotyped behaviors. The Diagnostic and Statistical Manual Fifth (DSM-5) indicates that ASD is a neurodevelopmental disorder and the criteria for its diagnosis are persistent failures in social communication and social interaction across multiple environments and restricted and repetitive patterns of current or past behavior, interests and activities (APA, 2013). These symptoms must be present in the early developmental period but may not become fully evident until the social requests exceed the limited capabilities and cause clinical disability in the social, practical, or other important areas (Odom et al., 2021). These disorders are not better explained by intellectual disability or pervasive developmental delay, and intellectual disability and ASD often occur together to produce a diagnosis of both ASD and intellectual disability, and social communication must be lower than the expected general developmental level (Ohara, Kanejima, Kitamura & Izawa, 2019).

Ohara et al. (2019) and Odom et al. (2021) point out that autism clearly and directly affects the child and appears in his general communication, language acquisition, behavioral expressions, and way of expressing feelings and sensations. In addition, the autistic child shows abnormal behavioral patterns such as social immaturity and aggression sometimes. Communication disorders are among the central and basic disorders that negatively affect the manifestations of normal growth and social interaction. Paraskevi (2021) indicated that ASD is one of the puzzles due to its varying characteristics. Therefore, it has attracted the attention of many scientists, and many explanations have emerged in an attempt to understand this disorder. It can be said that until now, scientists and researchers have not reached definite causes that can be taken and based on to determine the

causes of ASD. In addition to the lack of agreement on one reason for the occurrence of the disorder, despite a large number of research and studies conducted in this field (Rayan & Ahmad, 2018). The causes of ASD have been unknown for a long period. Scientific research on ASD has not reached a definitive conclusion about the direct cause of the disorder, and in many cases, the cause of the disorder is unknown (Ressa, 2022)

The VB-MAPP

The Verbal Behavior Milestones Assessment and Placement Program (**VB-MAPP**) is considered one of the field programs that are used to rehabilitate children with ASD (Mahmoud, 2021). This program is characterized by a wide range of flexibility in training and rehabilitation due to the program's dependence on many aspects that are focused on and transformed from weaknesses and shortcomings into strengths, contributing to the rehabilitation of children with ASD (Munoz, 2016). The **VB-MAPP** program is considered a reference program, teaching curricula, and a follow-up system for the skills of autistic children, and children with developmental delays in the age group (0-18 months, 18-30 months, and 30-48 months) (Blanco, 2019). This program is designed for parents and professionals to obtain information regarding the child's current skill level and to provide learning objectives for skills that are impaired, so that parents, teachers, or anyone who knows the child can assess according to the program (Partington, 2010).

The **VB-MAPP** program is an assessment tool, a guiding approach, and a recording system that contains a visual system to track the progress of the specific skills of individuals with ASD, or developmental disorder. It is recommended at the beginning of the VB-MAPP program to identify

strengths and needs in language abilities, academic skills, and visual performance skills (Semenovich, Manelis, Khaustov, Kozorez & Morozova, 2015). This is for evaluation and setting appropriate goals. You may see that the skill areas are very similar in the ABLLs-R program, but differ in defining the goals to be taught, how to learn them, and what is the goal of learning, and it is recommended to make a report repeatedly to measure progress (Ackley et al., 2019).

Based on the work of renowned behaviorist B.F. Skinner, the VB-MAPP or Verbal Behavior Milestones Assessment and Placement Program is a criterion-referenced assessment tool, curriculum guide, and skill tracking system that is designed for children with autism, and other individuals who demonstrate language delays. There are three core components to the VB-MAPP:

- 1- The Milestones Assessment includes 170 measurable learning and language milestones which are designed to assess a learners existing verbal and related skills. We use this tool to help us design a individualized intervention strategy for our learners.
- 2- The Barriers Assessments help identify the specific challenges a learner is having with learning and language acquisition.
- 3- The Transition Assessment helps assess whether a learner is ready to move to a less restrictive learning environment. We use it to understand how our learners are progressing toward their goals.
- 4- Task Analysis and Skills Tracking form the basis for daily skill building. There are over 900 skills in this tool (Dunkel-Jackson & Dixon, 2018).

Dixon et al. (2014) defined the program based on Verbal Behavior Analysis (VBA) as one of the field programs through which it is possible to prepare an assessment, an indicative curriculum, and a recording system that contains a list of basic and necessary skills analysis to communicate and learn skills of the language from daily experiences successfully and effectively, it also contains a strategy for analyzing and setting of inclusion priorities. Accordingly, the individual program's educational objectives are appropriately chosen, and it also contains a visual system to follow up on the child's progress, which clarifies and indicates the new skills he has acquired, through which strengths and needs can be accurately identified. Gabig (2013) defines the VB-MAPP program as an assessment of basic language and communication skills based on the analysis of basic and necessary skills for communication and early academic skills from everyday experiences. The program contains a strategy for analyzing and determining educational priorities and illustrating the current abilities of the child. It also contains a visual system for tracking own progress. Which clarifies and refers to the new skills he has acquired and shows how to upgrade and track them. Dunkel-Jackson & Dixon (2018) define Verbal Behavior Analysis (VBA) based on Applied Behavior Analysis (ABA) as a diagnostic-teaching program that depends on revealing the weaknesses of the child with ASD in skills based on the criterion specified in the program and then preparing the individual educational and learning plan and training the child on the goals specified in the program plans according to the phases of Applied Behavior Analysis (ABA).

The Verbal Behavior Milestones Assessment and Placement Program (**VB-MAPP**) depends on the (ABA) strategy in its reliance on repetition of training, and the sequence in the training phase is from the beginning of the

examination to the stages of extended attempts, in addition to the presence of diversity in the training environment and trainers, to achieve generalization of the task (Usry, Partington & Partington, 2018). The ABLLs-R program places great importance on social reinforcement in its various forms, such as games, and completely rejects nutritional reinforcement. The VB-MAPP philosophy is based on Skinner's (1957) Verbal Behavior Theory for Language Assessment and represents the efforts of many scholars over the past fifty years (Malkin, Dixon, Speelman, & Luke, 2017). Skinner's analysis of verbal behavior is based on the same behavioral principles and basic research that underlie discrete trials teaching procedures and applied behavior analysis (Malkin et al., 2017).

The process of evaluating an autistic child through the use of the VB-MAPP program is a process that must be carried out with the utmost care, as the implementation of assessment mechanisms is based on focusing on observation and focusing on the strengths and shortcomings of autistic child (Stueber, 2016). Data related to the child's performance in the specific skills is collected through direct observation or by interviewing the teacher and parents (Usry et al., 2018). The mark that the child deserves for each task is determined by placing a circle on the mark that the child deserves for each training task depending on the performance standard for this task. This criterion accurately determines the level of the child's performance of this task by specifying a mark for the number of goals the child performs and the way he performs this task (Stueber, 2016). The evaluation is re-evaluated every one to two months, depending on the level of progress of the child (Dunkel-Jackson & Dixon, 2018).

Zhao and Chen (2018) pointed out that the VB-MAPP program covers different areas and is unique in evaluating various language skills so that it encourages and motivates the child to respond, as well as stimulating his ability to respond when exposed to any different environment (verbal or non-verbal), and it also helps to stimulate his ability to circulate skills and use them automatically. The fields covered by the VB-MAPP program are:

- 1- The Milestones Assessment includes 170 measurable learning and language milestones which are designed to assess a learners existing verbal and related skills. We use this tool to help us design a individualized intervention strategy for our learners.
- 2- The Barriers Assessments helps identify the specific challenges a learner is having with learning and language acquisitions.
- 3- The Transition Assessment helps assess whether a learner is ready to move to a less restrictive learning environment. We use it to understand how our learners are progressing toward their goals.
- 4- Task Analysis and Skills Tracking form the basis for daily skill building. There are over 900 skills in this tool (Dunkel-Jackson & Dixon, 2018).

Mohammed et al., (2022) aimed to identify the effectiveness of a program to assess and employ the Milestones of Verbal Behavior of Mark Sandberg in developing verbal communication in children with autism, based on a sample of five children with autism disorder at the age of four years, the researchers used the experimental method for his suitability of the study procedures, and the main study tools were in the program for evaluating and employing The Verbal Behavior Milestones Assessment and

Placement Program (VB-MAPP), researchers translation, verbal communication scale (VCS), also researchers translation. The results of the study reached the effectiveness of the program to evaluate and employ the parameters of the verbal behavior of Mark Sandberg in developing verbal communication in children with autism.

Ibrahim (2021) aimed to measure the effectiveness of the Verbal Behavior Assessment Program (VB-MAPP) in developing cognitive aspects in children with autism spectrum disorders. The study focused on the following elements of perception: visual perception, auditory perception, and motor perception, in a sample of (16) children with autism in the Zagazig area, aged between (4-6) years. They were divided into two equal groups, where the experimental method was used, and the study included the following tools: Gilliam Scale, Stanford-Binet Intelligence Scale, Fifth Edition, Cognition Scale, and finally the Verbal Behavior Assessment Program (VB-MAPP). The study found that there were statistically significant differences between the average ranks of the scores of the members of the experimental and control groups in the post-measurement after applying the Verbal Behavior Assessment Program (VB-MAPP) for early intervention in favor of the experimental group, and continued improvement in the members of the experimental group who were exposed to the procedures, techniques, strategies, and activities of the Verbal Behavior Program.

Al-Taqatqa and Al-Qarni (2020) aimed to identify the effectiveness of a training program based on applied behavioral analysis techniques in developing expressive language skills for people with intellectual disabilities and its impact on language use. The study sample consisted of (16) students

from Yanbu City in the Kingdom of Saudi Arabia, aged (8-9) years, using the quasi-experimental approach, the expressive language scale, and the training program based on applied and verbal behavioral analysis techniques in developing expressive language skills and their use for people with intellectual disabilities. The results showed statistically significant differences in students' performance on the total score of the post-measurement of the two scales in favor of the experimental group.

Zhao and Chen (2018) determined whether or not autistic child benefit from participating in organized exercise programs that encourage socialization and dialogue (ASD). Fifty students from a school for students with ASD were split into two groups. Twenty-five autistic child were randomly assigned to the experimental group, and the same number were assigned to the control group, both of which engaged in regular physical activity. Twenty-four exercise sessions were introduced over the course of 12 weeks as part of an organized physical activity program for autistic child that focused on improving their social interaction and communication skills. In both the SSIS and ABLLS-R, the experimental group demonstrated significant growth in social competence and communication from pre- to post-testing. Furthermore, the outcomes demonstrated considerable enhancements in the areas of communication, cooperation, social interaction, and self-control. By contrast, in the control group, there were no discernible variations.

Al-Bakkar (2018) aimed to identify the effectiveness of an early intervention training program based on verbal behavior in developing communication skills in children with autism in the Kingdom of Saudi Arabia, using the quasi-experimental approach. The study sample consisted of (12) autistic children, aged between (4-6) years. The study used the

following tools: a translated scale for assessing verbal behavior (Sundberg, 1998), a scale for estimating the teacher's joint attention for the autistic child, and the Visions Program for the autistic child based on the theory of verbal behavior. The program was implemented at the Human Development Center in Riyadh. The results showed that there were statistically significant differences between the two scales due to the post-measurement, which indicates the effectiveness of the program based on verbal behavior in developing communication skills in children with autism.

Ezz El-Din (2016) tested the effectiveness of a training program based on applied/verbal behavior analysis in developing the language skills of autistic children in the early intervention stage on a sample consisting of (20) male and female autistic children in the Kingdom of Saudi Arabia in the Qassim region, whose ages ranged between (3-9) years. The experimental method was used, and the study tools consisted of: the training program saturated with verbal linguistic behavior strategies, and its measurement tool. The program included eight dimensions: attention skills, imitation skills, receptive language skills, expressive language skills, basic language skills, cognitive skills, self-care skills, and social interaction skills. The results showed statistically significant differences between the experimental and control groups on the post-test and follow-up measurements in favor of the experimental group members.

Methodology

The quasi-experimental approach was used (for one group), where the study subjects were subjected to pre-measurement, continuous measurement during training after each stage, and post-measurement. The tracer measurement (follow-up) was also performed after stopping training for (3) weeks from the end of the last skill training.

Population and Sample of Study

The study members were selected in an accessible way who met the conditions of the study sample from the children of Lubbaik Center in Jeddah. The number of study sample members was (20) children with ASD. The study sample members were selected according to the following criteria:

- Children were diagnosed formally with mild ASD.
- Not accompanying another disability with autism.
- Within the age group of (6-12) years.
- They have never had training in the skills under study.

Study tools

To achieve the objectives of the study, two study tools were used:

First: A scale of communication skills (levels 1&2) and academic skills (level3)

The researcher prepared the scale from the items of the VB-MAPP program for children with ASD. The scale consists of 106 items arranged sequentially from the easiest to the most difficult tasks. Levels 1 and 2 measure visual performance skills with 20 items, imitation with 20 items, mand with 20 items, social behavior with 6 items, and level 3 measures academic skills consisting of pre-reading with 15 items, reading with 10 items, writing with 10 items, and interverbal with 5 items.

Tool Validity and Reliability

The validity of the tool was verified in two ways:

- Nine arbitrators reviewed the tool content to ensure its accuracy, and their approval rating of 80% served as the basis for the settlement reached by the arbitrators.

- The discriminatory validity of the scale was tested by applying it to an exploratory sample consisting of 10 autistic children, and the coefficients of (F) values for discriminatory validity ranged between 70.5 and 120.3 with a (P) value less than 0.05.

The reliability of the tool was also calculated using the internal consistency method according to Cronbach's alpha equation, where the reliability coefficient as a whole was (0.915), and the reliability coefficients for all dimensions ranged between (0.700-0.935).

Second: The Training Program Derived from VB-MAPP

It is a program for autistic children and developmental delay that includes a system for tracking progress in specific skills after training. The program covers two main areas which are divided into four domains containing (40) skills on which autistic children are trained based on the verbal/applied behavior analysis strategies, which depend on the repetition of training (shaping, task analysis, DTT, reinforcement, and VBA) according to organized steps and with a standard of no less than (80%) to accept performance on the task is under training to get them to achieve independence and the ability to develop academic, social and communication domains.

The VB-MAPP is based on Skinner's theory of applications of verbal behavior that pays attention to a child's environmental stimuli and positive reinforcement. VB-MAPP program is also based on applied behavioral analysis strategies, as the program relies on training the child on the skill level, he has achieved in the measurement of the skills of the VB-MAPP program. It starts from the examination stage in the ABA/VBA, then moves through repetition and provides the appropriate indoctrination for the nature of the skill

and the level of the child, focuses on social reinforcement, and then moves to the next stages in which the level of acceptance of performance is not less than 80% to finally reach the stage of extended attempts, which are between 3 goals, which ensures the achievement of effective learning, distinguishing between goals and generalizing the response.

Study Procedures

To achieve the objectives of the study, the following was carried out:

- Designing a scale based on the program to measure visual performance skills, imitation, request, generalization, and academic skills, and the number of its items is (106).
- Nine SLPs, autism and early intervention experts, including college professors and professionals in the field of autism education and speech therapy to evaluate the program.
- Start in the Lubbaik Center in the second semester of 2023/2024 by observing the students and collecting information about them,
- The scale was applied to obtain indications of validity and reliability.
- Applying the pre-measurement to the study sample.
- The work of the training program began with the first assessment of the skills of autistic children by applying the scale and evaluating their abilities to perform the items of the scale.
- Applying the skills under study in the training program to each of the 20 children in the study sample, and listing the weaknesses that each child suffers from on each skill separately.
- Train children with individual training sessions based on ABA/VBA applications.

- All assignments are reevaluated monthly to determine whether or not the student is making progress toward his or her learning goals, and whether or not the student should be moved to a higher level of difficulty if he or she is not yet ready to master the most difficult level.
- After the end of the training period, which lasted two months of training, the post-measurement was applied to the study sample.
- The follow-up measurement was conducted on the sample members after an absence of one month from the last training task, where the tasks that were trained were measured.

Data Analysis

Following data collection, the researcher calculated pre- and post-test score means and standard deviations. To demonstrate how the program based on VB-MAPP aided in the development of basic language and communication among children with ASD, an impact size was calculated using the Eta square. The Wilcoxon test and Z-score were also utilized to demonstrate the degree of variation between two comparably sized samples.

Results and Discussion

To answer the first question which states " Are there differences between the average performance of the study members in the pre and post-measurements on skills of levels 1 and 2 (visual performance, imitation, mand, and social behavior), and academic skills of level 3 (pre-reading, reading, writing, and intraverbal) attributable to training on the VB-MAPP program? " The table below displays the findings.

Table (1)
Pre and Post-Measurement

Dimensions	Pre/ Post	N	Mean Rank	Sum of Ranks	Z	P
Visual performance	Negative rank	3	5.17	15.50	3.051	0.002
	Positive rank	15	10.37	155.50		
	Ties	2				
	Total	20				
imitation	Negative rank	0	0.00	0.00	3.992	0.000
	Positive rank	20	10.50	210.00		
	Ties	0				
	Total	20				
mand	Negative rank	0	0.00	0.00	3.923	0.000
	Positive rank	20	10.50	210.00		
	Ties	0				
	Total	20				
Social behavior	Negative rank	2	5.50	11.00	3.920	0.002
	Positive rank	15	9.47	142.00		
	Ties	3				
	Total	20				
Total	Negative rank	6	7.50	45.00	2.012	0.044
	Positive rank	13	11.15	145.00		
	Ties	1				
	Total	20				
Reading	Negative rank	0	0.00	0.00	3.922	0.000
	Positive rank	20	10.50	210.00		
	Ties	0				
	Total	20				
Pre-reading	Negative rank	0	0.00	0.00	3.920	0.000
	Positive rank	20	10.50	210.00		
	Ties	0				
	Total	20				
Writing	Negative rank	0	1.00	0.00	3.923	0.000
	Positive rank	20	10.50	210.00		
	Ties	0				
	Total	20				
intraverbal	Negative rank	0	0.00	0.00	3.934	0.000
	Positive rank	20	10.50	210.00		
	Ties	0				
	Total	20				
Total	Negative rank	0	0.00	0.00	3.920	0.000
	Positive rank	20	10.50	210.00		
	Ties	0				
	Total	20				

According to Table 1, there are statistically significant discrepancies between the experimental group's mean scores in the areas of communication and language skills - levels 1 and 2- (visual performance, imitation, mand, and social behavior), and academic skills- level 3 (reading, pre-reading, writing, and intraverbal), and the overall score of each skill in favor of the post measurement. In the post-measurement, the children showed an improvement in their basic language and learning skills (visual performance, imitation, mand, and social behavior), and academic skills (reading, pre-reading, writing, and intraverbal).

The research attributes this result to the effectiveness of the training program that focuses on developing the skills under study for autistic children. When the children were first trained to improve the skills under study, it was known that autistic children suffer from deficiencies in communication and academic skills, according to the criteria for diagnosing autistic children as stated in the Fifth Diagnostic and Statistical Manual. The improvement that occurred to the children of the experimental group in basic communication skills and academic skills in dimensional measurement can be attributed to the nature and quality of the activities included in the program sessions. During the preparation of the program based on VB-MAPP, emphasis was placed on attractive and diverse activities, and more than one strategy was used to train the children of the experimental group to improve their skills. Many of the technicians of the VB-MAPP program were also used, as it is a program specialized in rehabilitating autistic children and contains complete areas in terms of basic language and academic skills; therefore, the techniques of this program were used to train the experimental group to improve those skills. This result agreed with the results of Mohammed et al., (2022), Ibrahim (2021), Al-Taqatqa and Al-Qarni (2020), Al-Bakkar (2018), and Zhao and Chen (2018).

To answer the second question which states " Is there a statistically significant effect of the VB-MAPP program in improving the basic skills in the follow-up measurement skills of levels 1 and 2 (visual performance, imitation, mand, and social behavior), and skills of level 3 (pre-reading, reading, writing, and intraverbal) among autistic children?" The results are shown in the following table.

Table (2)
Post and Follow-up Measurement

Dimensions	Post/ Follow	N	Mean Rank	Sum of Ranks	Z	P
Visual performance	Negative rank	12	8.17	98.00	1.560	0.119
	Positive rank	4	9.50	38.00		
	Ties	4				
	Total	20				
imitation	Negative rank	8	6.31	50.50	1.232	0.218
	Positive rank	9	11.39	102.50		
	Ties	3				
	Total	20				
mand	Negative rank	3	2.00	6.00	1.732	0.083
	Positive rank	0	0.00	0.00		
	Ties	17				
	Total	20				
Social behavior	Negative rank	8	7.50	60.00	0.416	0.678
	Positive rank	8	9.50	76.00		
	Ties	4				
	Total	20				
Total	Negative rank	9	11.28	101.50	0.131	0.896
	Positive rank	11	9.86	108.50		
	Ties	0				
	Total	20				
Reading	Negative rank	6	4.92	29.50	0.830	0.407
	Positive rank	3	5.17	15.50		
	Ties	11				
	Total	20				
Pre-reading	Negative rank	11	10.95	120.50	1.028	0.304
	Positive rank	8	8.69	69.50		
	Ties	1				
	Total	20				
Writing	Negative rank	11	10.73	118.00	1.423	0.155
	Positive rank	7	7.57	53.00		
	Ties	2				
	Total	20				
intraverbal	Negative rank	6	8.83	53.00	0.777	0.437
	Positive rank	10	8.30	83.00		
	Ties	4				
	Total	20				
Total	Negative rank	8	9.63	77.00	0.466	0.641
	Positive rank	8	7.38	59.00		
	Ties	4				
	Total	20				

Results from both the post-test and the follow-up evaluations are consistent with one another (Table 2). This indicates that there has been no relapse after the completion of the program and that its effects have lasted throughout the follow-up period. This can be attributed to the fact that the children got enough of practice with the program's activities and developed academic skills (reading, pre-reading, writing, and intraverbal) as well as communication skills (visual performance, imitation, mand, and social behavior).

The researcher believes that the success of social reinforcement in its many guises, as well as the supply of games as physical reinforcement for children, are responsible for the task retention of the study members. The children's interest in training and their participation in the training sessions were greatly influenced by the trainer's familiarity with the children. Further, training plays an important part in the ABA/VBA technique, which consists of eight (8) sequential stages that rely on the application of repeating the performance of the work to reach the child's performance of the task expected of him alone and without giving any form of memorization. Furthermore, the minimum acceptable performance level was 80%, which represents the point at which the child has demonstrated sufficient competence in the task to move on to the next stage of training and has learned the material well enough that it will be difficult for him to forget it or refuse to perform it. This result agreed with Al-Taqatqa and Al-Qarni (2020), Zhao and Chen (2018), and Ezz El-Din (2016).

Conclusion

This study supports the idea that children with ASD can increase their fundamental language and academic abilities (visual performance, imitation,

mand, and social behavior) and academic competencies through the VB-MAPP curriculum (reading, pre-reading, writing, and intraverbal). It also implies that the VB-MAPP program may be more effective than traditional ones at improving the academic and fundamental language abilities of these pupils (visual performance, imitation, mand, and social behavior) (reading, pre-reading, writing, and intraverbal). Therefore, in line with the program's objectives, teachers, practitioners, and SLPs would benefit from helping their students' fundamental language abilities (visual performance, imitation, mand, and social behavior), as well as their academic abilities (reading, pre-reading, writing, and intraverbal). The results of this study showed how the VB-MAPP program aids in the development of strong visual performance, imitation, request, social behavior, reading, writing, and intraverbal skills in autistic children. The VB-MAPP program fosters a relaxed, stress-free atmosphere and offers students the chance to encourage, support, and recognize one another. This may be observed in the way the training program hall is set up to prevent children from getting distracted by things like comfortable kid seating, good hall lighting, and the absence of additional educational gadgets and posters.

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Recommendations:

- a) Encouraging practitioners and speech therapists to apply programs based on verbal behavioral analysis.

- b) Providing intensive workshops on the VB-MAPP program for practitioners, SLPs, and teachers.
- c) Using EBPs in the training of children with ASD

Suggestions:

Through the results of the current study, the following research proposals can be suggested:

- 1- Conduct studies on the effectiveness of early intervention programs in developing language skills based on verbal behavioral analysis.
- 2- Conduct a study showing the nature of the relationship between language skills and verbal behavioral analysis for people with disabilities.

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