

Need Analysis in Developing ASD Board Game as Teaching Kits Scaffolding to Enhance Students with Autism Spectrum Disorder in Preoperational Stage

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Abstract

This study is (aims) to investigate effective ways of teaching and learning for autistic students. A part of this study also identifies the need to design and develop appropriate Autism Teaching Kits as Scaffolding to enhance autistic students' learning processes in the preoperational stage. The purpose of this study is to prepare an Autism Kit, which is a tool that can be used in teaching and learning with autistic children in the Preoperational Stage. The increase in the number of children diagnosed with autism almost every year and the purpose of this research is to identify, investigate and meet the needs of autistic children by using teaching aids, namely the Autism Kit, as scaffolding that is easy to use in autism learning sessions. This Autism Kit is easy to make as this study can be used as a reference for the process because this is considered a product. Besides that, it can increase teachers' creativity to formulate a teaching aid that can be regarded as something new, different, and interesting to attract students' attention and improve their understanding. Teachers and parents can use the Autism Kit for the teaching and learning process in schools or at home as a teaching aid instead of using material that does not contain suitable content knowledge for autistic children. This research explores employed qualitative approach to collect data on the teaching and learning process through interviews with special education teachers and parents of autistic children in the preoperational stage. The findings revealed that the implementation of game-based learning or gamification is one of the effective ways in educational settings for these special needs among autism students. This study provides useful guides for parents with autistic children, special education schools, special education directors, and special education teachers who strive to provide the best services for children diagnosed with autism in the district while balancing the needs of other students in the district. This research is significant to students, teachers, and parents.

Keywords: Teaching kits, Scaffolding, Autism Spectrum Disorder, Preoperational Stage

Introduction

With more than 2 million infected individuals worldwide, the World Health Organization has dubbed the coronavirus illness (COVID-19) a global outbreak (pandemic) (WHO Coronavirus (COVID-19) Dashboard, 2023). Governments from all over the world adopted several actions to stop the outbreak from spreading. People are urged to remain at home as new cases increase. Active living spaces, including sports facilities, parks, and schools, are often closed in most nations. In this process, sitting at home for an extended period makes it challenging for people with special needs, such as those with autism spectrum disorders (ASD), to remain physically active. Children with ASD experience educational disruption, particularly because of closed special education institutions and rehabilitation facilities (Yarimkaya & Esentürk, 2020). Autism Spectrum Disorder is a developmental disorder in nerves in a person experienced since birth or during toddler. Prominent characteristics in children with autistic spectrum disorder (ASD) are children concerned with difficulties in building social relations (Jhuo & Chu, 2022). Difficulties in social relationships and interactions have become a hallmark of autism. Therefore, the need to understand the nature of this difficulty and to find an effective treatment for them has been the core of autism research and educational practices. Unlike children in general who learn how to be social and interactive by looking at how other people talk, play, and interact with each other, enjoy the help, and initiate social engagement, and maintain and respond to interactions with others, children with autism often do not show the expected development of social interaction skills early. They often avoid socializing and are awkward. Children of ASD avoid social contact by raging or running away from people trying to interact with they seek social contact with people only if they are wanting something (Lal and Ganesan, 2011).

Educating students with autism should be a lesson that is divided into several smaller groups so that the process of teaching and learning will work properly and effectively. Scaffolding teaching techniques can be used in teaching and learning sessions in the classroom. Scaffolding is defined as the guidance provided by adults to children as they try to solve a problem beyond their knowledge. Scaffolding is also the assistance given by the teacher to the students so that the students can complete the task that they fail to do on their own (Anwar et al., 2022). Effective scaffolding can follow the needs of the Autism students by modifying the needs and tasks of students depending on the achievement level that they can achieve. Autism is a brain disorder that distracts communicating, socializing, and maintaining what is considered a normal relationship with others (Aboo Bakar & Aboo Bakar, 2021). Children with autism may have varied levels of skills and capacities and behaviors. Thus, their parents and teacher need to give full attention to their learning process. Autistic need to learn gradually so that they can catch up with what is being taught by their teacher (Che Ku Mohd et al., 2019)

Problem Statement

Through preliminary interviews with Raja Perempuan Zainab II Hospital Paediatrician, Dr. Shazreen, and Fatimah Shaari, they mentioned apart from facing emotional instability, this special child also suffered from intellectual disability. Thus, Dr. Shazreen suggested that parents give support and commitment to help children with autism to enable them to grow into independent adults and social skills level, communicate better, as well as optimize behavior. Educating students with autism should be an interesting lesson that is divided into several smaller groups so that the process of teaching and learning will work properly, enjoy and be effective. Game-based learning Scaffolding teaching techniques can be used in

teaching and learning sessions in the classroom. Scaffolding is defined as the guidance provided by adults to children as they try to solve a problem beyond their knowledge. Wouters and Van Der Meulen (2020) suggested that learning has become ever more attractive to the level and preferences of learners and game-based learning.

According to Trajkovic et al. (2018), game-oriented learning improves learning practices in the educational process. Teachers and parents can use such as Board Games for the teaching and learning process in schools or at home as a teaching aid instead of using material that does not contain knowledge for autistic children. However, Che Ku Mohd et al. (2019) stated that nowadays, there are not many products or tools in the market that targeted autistic children. As a result, more products need to be produced to help these children in building their cognitive and social skills, communication, and self-direction.

Though the idea of using games in educational settings has been around for decades, as a research field it is still in its early stages. As such, there is still an unclear underlying mechanism by which games or game elements involve learners and promote learning (Ninausa et al., 2019). Researchers believe that this ASD Board game as developed in this study can be used as scaffolding with the assistance given by the teacher to the students so that the students can complete the task that they fail to do on their own. Effective scaffolding can follow the needs of the Autism students by modifying the needs and tasks of students depending on the achievement level that they can achieve. Besides that, it can increase teachers' creativity to formulate a teaching aid that can be regarded as something new, different, and interesting to attract students' attention and improve their understanding.

Research Objective

The research objectives of this study are

1. To investigate the teacher's opinion on the effective ways of enhancing autistic student's learning process in the preoperational stage
2. To identify the suitable characteristics of educational teaching aids for autistic students preferred to use in teaching and learning.

Methodology

This research adopts the Design and Development Method (Richey & Klein, 2007) that focuses on the development of ASD Board Games as a teaching kit to enhance autistic students' learning process in the preoperational stage. Developing a creative design for teaching and learning could be one of the ways to capture students' attention and interest and be able to increase awareness among autistic students' learning process in the preoperational stage. The whole research has three phases which include Phase 1: Needs Analysis, Phase 2: Design and Development, and Phase 3: Implementation and Evaluation. However, this paper will only discuss findings from Phase 1 of the three phases involved in the entire research.

Sample

The researcher wanted to find out whether they had experienced learning through the tools that related to gamification as a teaching kit in the classroom. Furthermore, both positive and negative reactions will be recorded throughout the interview. The sample was special needs, teachers. The sampling technique that was used was purposive sampling. This sampling technique required the researcher to find respondents with a specific purpose. Phase 1 in this study involves the need analysis to design and development of the ASD Board Games as a

teaching kit to enhance autistic students' learning process in the preoperational stage. Researchers have selected 7 experienced autism teachers as purposive samples.

Research Instrument

To answer the first objective of this study, need analysis research has been carried out to look at the requirements to construct ASD Board Game. The researchers interviewed 12 experienced autism teachers. The semi-structured interview was held separately among the respondents.

Data Analysis

The data analysis from phase 1 was analyzed by qualitative analysis. Data were collected from semi-structured interviews with (7) Autism teachers. The researchers recorded verbatim all the data information and analyzed thematically from the respondent during the interview session.

Findings and Discussions

The discussion and analysis of the finding from the first phase are through interviews with 7 Special Art Education Teachers. The interview is derived based on the following theme below:

1. What are the teacher's opinion teacher's effective ways of teaching and learning to enhance the learning process of autistic students?
2. Which characteristic of educational teaching aids for autistic students preferred to use in teaching and learning?

a. The teacher's opinion on the effective ways of teaching and learning to enhance the learning process of autistic students.

The results of the analysis are based on interviews with teachers' opinions of effective teaching and learning with the use of ASD Board Game that are suitable for the autistic student to enhance their learning process. Most of the respondents address that interactive teaching aids can attract **students' interest**. Respondent 1 explained that he was able to capture the attention of students through drawing. Respondent 2 stated that teachers must focus on preparation to attract students' attention to learning. The third and fourth respondents elaborated on how the instructional aids could attract students' attention. When using teaching aids, it was stated in R3's excerpt that students must be given opportunities to play while concentrating on psychomotor skills. Respondent 5 concurred with Respondents 3 and 4 and elaborated on the necessity of repetition for these pupils. Additionally, as Respondent 6 and Respondent 7 both noted, the teaching aids offered more opportunities for tracking students' progress and were creative in their approach to instruction. This finding was further supported by Zsoldos-Marchis, I. (2020) which mentioned that in the review of respondents, using board-games is an attractive teaching and learning method for pupils which develops their cognition competencies and social skills.

Respondent 1 Stated

The strategy I often use is a variety of teaching materials. Sometimes I will use a small whiteboard to draw visuals so that the student understands what the teacher is trying to convey. For example, the study of Islam's 5 pillars of Islam. For each of these pillars, I will draw what the word means. Therefore, I need to be prepared with some examples of pictures because the student is fond of when I apply drawing while studying. Other than that, the

strategy I use is to impress her with things she likes like clocks, elevators, machines that have gears, animals, animal life cycles, and so on.

Respondent 2 Stated

Find the best teaching tools for the children to learn by planning a teaching plan that can help them to be more focused and pique their interest. For example, while learning, the teacher could analyze their behavior and be prepared to find some physical activities such as games to help them comfortable and provide every student in the class with access to a safe and effective education. Some educational tools such as video games also could enhance and boost children's focus and interaction skills. From the learner's perspective, plan tasks and activities that result in meaningful outcomes.

Respondent 3 Stated

The most important strategy in educating these autistic children is a way to attract their interest to enjoy learning usually these autistic children have focus problems .. they find it difficult to focus on something, so we need to be good at 'persuading' or 'tackle' autistic children this is so that interest in something of the learning. What I found was that these autistic children were more focused on play activities that involved their psychomotor skills, namely the involvement of their sensors.

Respondent 4 Stated

Emm.....that we do a lot.....aa we will use the game .. which is interesting. So that ... because children with autism the things they don't like, they will get bored quickly. Aaa he will go berserk.... .he will try to find a way out to get out of the second class. So, one has to create an interesting game. He can't sit still. He can't. Either way ... he must have a job. Need movement.

Respondent 5 Stated

Okay.....this is it in my opinion there are many good ways....effective ways that we can use in learning with children with autism. Maybe some of them are a little less suitable for them .. but there are also good ones for their use. If I am, I will usually provide teaching tools that can attract their interest to learn, yes like things related to games .. that use their sensors a lot, yes, because that's why will help their development a little bit as well, yes .. Sometimes when we provide interesting teaching tools .. we don't even ask .. but they come and use the teaching kit by themselves....haa. Because children with autism .. sometimes .. these people are kind of curious too when we share colorful things like this .. it attracts people's interest to know what these things are hehe..and what's important. In teaching children with autism, right .. there must always be repetitionthere is a routine .. because that is one of the ways for them to easily follow and understand for the time to come .. there are many more good events that we can do. .but that's it .. they have to be a little patient, yes .. they need a gradual process, unlike normal students.

Respondent 6 Stated

If it's here... strategy. I want to say we are here .. first when students come here to teach them to listen to instructions. That is our first way to teach them. We will not do like when they come in .. they just straight away to teaching and learning haa like that. When they come, we will observe, look at his reaction, look at his attitude. Sometimes in a few days, we can't evaluate him. He will come like usual like everything is okay, but when it comes to the third

day and he starts to react like at his home .. we have started to be a little strict with him .. haa he has started coming to show his real attitude So, we're going to be more into observation. This autistic boy .. he's in his world. So, grab his attention first for him to focus. Because there are children with autism, at their parents' house they don't talk much so they don't have much vocab. So, we need..to talk to them. That's why for me, it's not just teachers who can teach children with autism, anyone can, you must take care of your energy. The child will duplicate the teacher .. if the teacher is an alert type, you will see that the child will also be alert. Secondly, after instruction, when he can give cooperation .. vocab is important .. he can listen to instructions .. he can understand .. usually, in 4 or 6 years he can understand. Okay once he can hear the instructions when you tell him to follow ... it's already time for him to be ready to learn. Okay, as you know ... learning is not just a statement with a book, the child will get bored quickly. There must be teaching tools .. there must be this thing .. this thing. There must be eye contact with them. Usually. We will give items that can grab people's attention .. usually, we will play with the mosaic.. the picture .. the square picture. For me, if it's basic autism students, there have 4 colors used ... I'll only give red for these students to use. Because I want to see him become stressed .. because with stress you will see their true behavior. Because if we give them a lot of colors, choose whichever he wants. I don't want to, I want when I tell him to take red only, and he will choose red only. Later, you will see he gets bored.. later when he started to be bored.. he will not do it. So, for itm there you have to say "No .. you do .. you do from there we will know his understanding when we say .. like you're not finishing... no water" haaa as we reward him. We give him to listen to instructions.

Respondent 7 Stated

I think ... this is for me eh haha .. in doing effective teaching and learning .. the first thing we have to look at is the teacher who teaches himself .. um .. like a teaching aid .. we put it as number two. Because what .. if we have an effective teaching tool .. but the teacher himself is not effective .. and not good at attracting the students to the learning session... it's hard too right haha .. em're like that. But if the teacher himself is creative, effective .. and innovative .. they must be a good way to use teaching aids that also... will look more interesting right. But .. from another perspective .. in teaching children with autism .. we have to understand .. it is not the same as other children. It has to be done over and over again so that he will remember and better understand and because it is like their routine. We can't aspect that today we taught him to say ... tomorrow he can say. It's not that easy hehe .. that patience must be there. Must think of an interesting way for us to tackle him .. haha.. to grab his attention. That's the main thing. Because if we can attract his attention .. this will make it easier for us to continue learning with them .. because if they don't like it .. we will take a little time for him to be comfortable with that way .. that's how it is.

b. The characteristic of educational teaching aids for autistic students preferred to use in teaching and learning

The researcher asked about the characteristics that the teachers use during teaching and learning with autistic students. All the respondents have experience teaching and creating teaching aids for educational use. The results of the analysis were based on interviews with teachers' opinions of characteristics of educational teaching aids for autistic students preferred to use in teaching and learning. According to the input provided by the respondents (Respondents 1, 3, and 7), the characteristics of the material appear to be holdable, manipulable, and sensorial, as students rely heavily on psychomotor skills. It was essential to

produce a safe teaching aid (Respondent 5) in addition to accommodating students with varying levels of autism (Respondent 6). This finding was further supported by Pratama et al. (2022) which mentioned that the implications of this study have produced a teaching aid that can be used as a template by teachers to build teaching aids that are more affordable, easy and safe to use so that they can be motivated to innovate in learning and become a new career opportunity.

Respondent 1 Stated

Learning materials for autistic children in Malaysia are quite diverse. Schools like Montessori have applied playful sambal learning and they have a lot of materials for such children's learning. However, the material is quite expensive and less affordable for low-income parents. Among the learning aids that are often used are learning about daily life as there are various activities as well as ways for children to learn how to zip clothes, tie shoelaces, how tie ribbons, and so on. The materials that are often used are based on materials that they can hold, taste, and experience. It is therefore easy for them to understand and apply in a situation such as tying shoelaces. The characteristic of board games that are suitable for autistic students is that the student can see the visuals displayed clearly because autistic students often learn and understand through pictures, and videos other than the material they can touch. Understanding can also occur when a game board has a variety of interesting sounds. They will pay more attention when there is something that catches their attention.

Respondent 2 Stated

Visual learning styles are one of the teaching tools that mainly help children, especially in the teaching and learning process. It is provided by using diagrams, graphics, and pictures to convey the words. For instance, Photo Cards can develop important social and emotional skills where it can help teach vocabulary about emotions and feelings that they can express in social situations. In my opinion, to make children be interested in Board Games, the characteristic must involve the social interaction between the children and their peers to ignite their social skills. Next, it must be simple games that could motivate them to participate in the games. Other than that, it could require flexibility, learning from mistakes, and adapting to new challenges and demands. It also requires some advantages such as for the children to boost their language skills as well as sharpen the child's focus. For instance, the visual effects or patterns could help them to focus on certain patterns and create a creative idea for them to explore.

Respondent 3 Stated

Teaching aids for autistic students in Malaysia are sufficient, but we still lack teachers for special education. As I said, these autistic children are more focused on their psychomotor activities.

Respondent 4 Stated

In fact, a lot of tools are created like a student's ... like a company, right? He is not necessarily for autism, for special education children actually ... or special education, he is at the same level as primary school children, and kindergarten children. You must create something fun. It's up to the teacher, how the teacher wants to play the game. There should be different interactive and fun games, but they should be suitable for children with autism. Because when they like it, they will focus on that thing only.

Respondent 5 Stated

Oh, the characteristic of teaching aids that need to be there, yes .. okay.. they must be safe to use by students with autism .. we know what kind of people they are hahaha.. but if with the help and guidance of the teacher .. I think still in control .. Insha'Allah. Emm ..then .. must be durable and can be used repeatedly .. because they are in learning should be done repeatedly so that they are easy to understand and easy for them to practice. It's also interesting if teaching tools are provided .. which have a lot of visuals .. because this special child prefers things like this. Can easily attract them in the learning session in the classroom, you know. If there have audio .. interesting too. If in terms of color. I think they have no problem .. have to teach them to adapt from a young age .. later when they are an adult, they will face a lot of colors, right? But that's it .. as long as the teaching aids can attract their interest too .. it's okay enough. If it's like a book ... like normal kids use ... it's not suitable for them. Can make an interesting game right .. it's okay also ha. Don't forget, in learning with autism .. there must be an element.. that can use these senses.

Respondent 6 Stated

This, Nurul .. teacher at this center, this teacher will make teaching tools every six months based on the level they teach, but if you practice once or twice, he can understand .. you make a teaching tool that is for beginner high-function level, but advanced can also be used ..so he can use it for other subjects. Okay .. like this he can use for children to know the letters, the sensory, etc. Even in advance, he can use words .. he can combine those things .. haa so it's not only one subject that is used use for beginners too .. advanced too. But if Nurul wants to ask about the specific characteristics of tools to teach autism. I don't know if you ask other people how .. but I .. think these students don't have very specific tools. Before, if you ask me when I was involved in teaching children with autism. I like to play with colors .. when you come to my office .. you see a lot of colors.. so vibrance. For me, I put myself in their situation and children's mood. Children like to see nice things. So, I remember I used to teach .. my class was light green .. soft green with white. ..I ask why so dull. I repainted everything orange .. bright color .. if my classroom is a soft color but I will put my picture in a colorful color. I was once reprimanded by my president not to make it colorful because she said that does is special needs students do not use bright colors. There was a boy who once came centered and cried because he didn't like the yellow color. Then I sat down and thought...I thought back to my daughter ..Sara used to be unfamiliar with people. I expose to people. She doesn't like noise; I explore the noise but if it's color. if the boy can't take it with bright color .. how does he want to go out with life later eh. Because we look closely outside, there are a lot of colors, if there is a yellow car, then he will always be hysterical, right? one student first when he comes here .. he will start shouting. I will say 'relax first .. it's just a color" same goes for this student " it's just a sound" but when I keep doing it like that .. no issue with those boys after that. I see the boy's room is vibrant now. I used to put red, a friend of mine asked why it was red .. later the boy will be hyper. I said I want him to be hyper .. because with that hyper I can see his true attitude. If truth the red can make a child hyper, I want to see. We're afraid to try. We must always do things repetitively, must always be repetitively and not give up quickly.

Respondent 7 Stated

Emm .. maybe something that uses a lot of sensory .. like the use of hand.. Something like can help them to communicate or talk ... things like that are lacking as well. After that, Najihah .. children with autism .. they prefer to play alone .. but it's good if there are activities that can

involve .. it's like more than one person .. haa, it's like a group activity like that .. it's like we can train them from the age of 4-5.

Conclusions

Based on the interview with autistic teachers, there are few of their opinions that were the same such as teaching and learning that involve autistic students' senses. Because for special needs students, their sensory is an important, especially for autistic students who have issues with their senses. Toran et al. (2013) said that children with autism also have sensory issues, where their sensory processing system functions abnormally. From the result, the researcher also concludes that the implementation of game-based learning or gamification is one of the effective ways in educational settings for these special needs students because as we know, the way of their learning from normal students is different. Autism students will get bored so easily. Game-based learning is a type of student-centered learning that allows students to acquire knowledge, build skills and cultivate positive attitudes through games that are specific to educational purposes. Thus, the need to do repetitive activities as a routine so it's important to make the educational aids in a fun way. Based on semi-structured interviews, there is no specific characteristic of educational teaching aids for autistic students. If the activities and the teaching aid itself are fun, they can still be accepted.

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