

The Influence of Picture Exchange Communication Systems (Pecs) on the Affective Development of Speech Utterances in Autism Spectrum Disorder (Asd)

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ABSTRACT:

Children who suffer from ASD typically face difficulties in speech development including emotional and psychomotor issues. This research focuses on examining the impact that the Visual-Spatial method, which is a part in the Picture Exchange Communication System (PECS) on speech development for children suffering from Autism Spectrum Disorder (ASD). The aim of this study is to determine the way in which perception of PECS influences psychomotor, emotional and speech development for these children. The study investigates the impact that emotional development as mediators in the relationship between psychomotor abilities as well as fluent communication and growing vocabulary among children with ASD. Through examining the psychological factors that affect speech development and communication, the study aims to discover efficient strategies for improving the communication of this group. The results demonstrate the importance of PECS and the Visual-Spatial technique in helping to increase vocabulary acquisition among children suffering from ASD. Furthermore, the qualitative studies the interaction between emotional development, speech utterance and psychomotor abilities in these children. What can this study teach us about creating individualised treatments and therapies for ASD children to enhance communication as well as development? This study tackles both affective and non-affective communication issues to better comprehend and assist ASD children to improve their communication skills and emotional development.

1. Introduction

Children suffering from Autism Spectrum Disorder (ASD) typically face difficulties with the area of speech development as well as communication. Many tools have been developed to aid them in communicating with other people (Hassan et al., 2022). One such tool is called the Picture Exchange Communication System (PECS) which makes use of pictures depicting actions, emotions, and words to assist children who suffer from ASD in their communication. A few studies indicate that PECS can be effective in improving speech utterances and language development for children who suffer from

ASD. However some studies show different opinions. This paper seeks to investigate the effects of PECS particularly using the Visual Spatial technique, on the emotional progression of speech utterances among children suffering from ASD. A child's vocabulary development of children suffering from ASD can be boosted by adding new vocabulary through PECS. Speech utterance however that is the actual speech production, has its own set of challenges and requires further analysis through interviews. In addition the emotional state children may either aid or hinder the development of speech utterance and development (Hassan et al., 2022). It is therefore crucial to take into



account the emotional aspects when introducing children suffering from ASD into PECS.

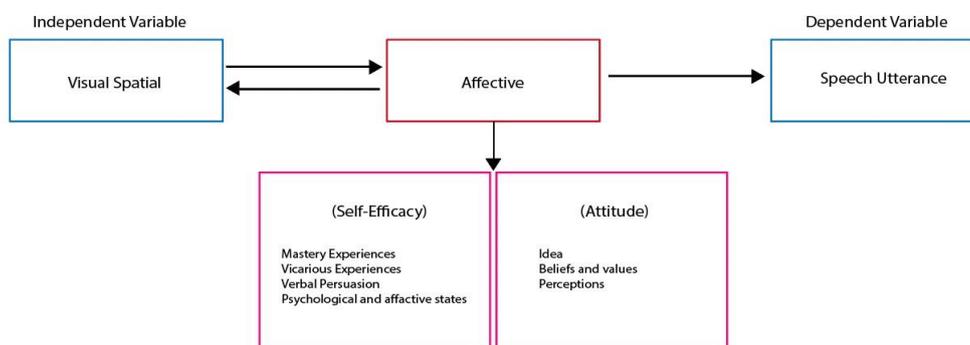


Figure 1: ASD's Affective Framework

The research is to investigate the way in which the perception of PECS especially the Visual-Spatial method, impacts the development of speech utterances among children suffering from ASD. Focusing on the process of affect that influences speech utterances in children, the research aims to investigate the effect of affective capabilities on psychomotor abilities, such as vocabulary expansion and fluency. To gain a deeper understanding interviewing teachers who work with children who have ASD are conducted to discuss further the results. Speaking is a complicated psychomotor ability that requires synchronization of affective processes and motor actions. Based on Table 1, ASD's Affective Framework discuss the affective abilities play an important role in this process because they aid in understanding and output of speech. When combined with auditory data, PECS prepares children by providing them with the meaning of words and helps them to memorize vocabulary. Through this increased understanding, children will be able to improve their speech utterance abilities and proficiency. The research was qualitative and exploratory. It employed thematic analysis using assistance from Atlas.ti software to study the impact of the visual-spatial technique that is used by PECS in speech development for children with Autism Spectrum Disorder (ASD). Thematic analysis is an extensively employed method of finding, analyzing and reporting patterns (themes) in qualitative data (Braun and Clarke, 2006). Utilizing this method, the research sought to obtain deeper insights into the experience and beliefs of children with ASD in relation to the use of the Visual-Spatial method for improving their speech language. The design of the research study allows for an extensive investigation of methods of communication specifically designed for

children who suffer from ASD. Through a meticulous analysis of thematics it was hoped to identify nuanced issues in relation to the effects on PECS in speaking development and the role that mediates in affective development. This study provides a comprehensive understanding of the experience of participants, which will aid in the development of individualized interventions and treatments for children who suffer from ASD. The study examines the importance of the impact of affective development that includes self-efficacy as well as attitudes, the study highlights the significance of motivational and emotional factors in speech development in children suffering from ASD. The integration of qualitative analysis and thematic recognition using Atlas.ti software permits an in-depth examination of these aspects and their possible impact on the improvement of communication for this group. Through structuring your introduction into a systematic way, the paper demonstrates the importance of addressing language development and speech-language difficulties encountered by children suffering from ASD. The paper also outlines the possible advantages of using PECS particularly the Visual-Spatial technique to assist in their communication. The integration in the framework of affect offers an extensive method of understanding the relationship between affective development speech utterance and improvement in vocabulary among children suffering from ASD.

2. Literature Review

Picture Exchange Communication System (PECS) Picture Exchange Communication System (PECS) is a system that enables non-verbal persons including people affected by autism, to interact through images



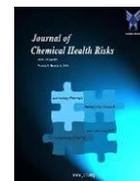
(Sulzer-Azaroff and co. 2009). It doesn't replace spoken language, but instead serves as an alternative means of communicating. PECS is comprised of six phases, which must be taught with a particular order to make it efficient. There was a concern that PECS could interfere with development of spoken language. development in spoken communication among children with autism. However, recent research has proven contrary (Bondy 2001). PECS is employed to teach nonverbal children who have autism or other difficulties with communication to communicate their desires thoughts, feelings, and ideas through the use of picture cards (Bondy 2001). It has been proven that PECS can also help reduce temper tantrums and increase socialization by enabling communication skills that they might not normally develop (Kruger 2022). But, for PECS to be effective children must be enthusiastic and eager to engage with others. A good executive functioning, organization abilities, and problem-solving skills are other important aspects. Autism patients often show improved visual skills which are beneficial to learn using visual aids (Mitchel and Ropar 2004). Visual aids like pictures cards, flashcards as well as video-based models, are frequently recommended by autism experts to boost learning and improve everyday functioning of children with autism (Rudy 2021). But, not all people who are autistic can be visual learners. It is crucial to take into consideration the individual needs and preferences of each person with autism.

Communication problems are common among people who have autism, and these issues can result in tantrums and emotional issues (Boonen and co. 2014). Learning to communicate effectively with those with autism is vital to their well-being as well as the wellbeing and well-being of the families they share with. Certain children with autism are not verbal and might be unable to develop spoken language, therefore alternatives to communication, like PECS is crucial. Children with autism are often struggling when it comes to expressive or receptive language abilities (Lord and co. 2006). They may have a restricted vocabulary and have trouble understanding what other people are saying to them. Interpreting social language, participating in conversations as well as recognizing non-verbal signals can be difficult for people with autism (Lord and co. 2006). The difficulties with communication could result in social difficulties and a diminished confidence in oneself (Ahmad et al., 2021; Safwan et al., 2023).

Regulation of emotions is a different issue for people with autism. Sensory integration problems, communication issues as well as a lack of social cue understanding may cause them to be unable to express their emotions effectively (Rudy 2023). Though

emotions aren't directly affected through autism, the condition alexithymia or the inability to recognize and define emotions, is frequently linked to autism spectrum disorder (Kinnaird and co. 2019.). Autism sufferers may be unable to understand and express their emotions, which could influence their emotional expression and development. Speech utterance can be a difficult task for people who suffer from ASD as well as PECS might not always enhance speech (Flippin and co. 2010.). The emotional and mental state that the kid is in, along with their self-efficacy and attitude are crucial to the process. PECS helps improve vocabulary and speech skills however, other intervention, such as the practice of auditory and advice by a speech therapist could be required for speech speaking. The attitude of children with autism toward learning to speak as well as their understanding of techniques utilized can greatly impact their development (Cooper and co. 2017.). Teachers need to recognize the needs of children with autism and provide an appropriate level of special education. Utilizing interactive devices, audio-visual aids and the help of speech therapists can improve speech development for children who have autism. Concentrating on the development of speech development for children with autism requires an approach that is multi-faceted and takes into account the strengths, weaknesses and individual preferences. Here are some suggestions which can help: Augmentative and Alternative Communication (AAC) In addition to PECS AAC strategies like speech-generating devices, sign languages, or digital apps can be used to improve communication. These devices can aid in speech development by giving auditory and visual signals for language comprehension and stimulating the use of language in expressive ways.

1. Speech Therapy: Working with the services of a speech therapist that specialize in working with children with autism is beneficial. Speech therapists can evaluate the child's language and speech abilities, develop tailored goals and strategies as well as provide specific interventions to enhance the production of speech, articulate and overall communication.
2. The Social Communication Interventions Programmes focused on social communication can assist children with autism to understand and interpret social signals as well as engage in conversations and develop practical language abilities. These programs typically require routine activities, role-playing and teaching appropriate social interaction.
3. Peer Interaction: Offering an opportunity to children who have autism connect and converse



with normally growing peers can be helpful. Peer assistance and modeling can help speaking development and provide the perfect environment for social interaction.

4. **Sensory Processing:** Sensory integration problems are typical among people with autism and may affect speech production. Implementing strategies for sensory integration into therapy sessions or routines can help control sensory input and help create an optimal setting that supports speech development.
5. **An Individual Education Plan (IEP):** Collaboration with teachers and the creation of an individual education plan which addresses the child's particular communication needs will provide an organized and supportive learning environment. The IEP could include goals, accommodations and strategies to help promote speech development and general communication abilities.
6. **Family Involvement:** Including the family members of the child to participate in their child's speech development process is essential. Instructing parents and caregivers in methods of communication, offering assistance and resources, and ensuring that they are using the same communication strategies at home can help to reinforce the child's development and create an environment that encourages communication.

3. Materials and Methods

With a qualitative analysis technique, employing deep-dive interviews with teachers from one of the centers for autism as source informants. The data set comprised transcripts of these interviews and the purpose of the study was to find patterns and themes that emerged from the data in order to determine the efficacy for Picture Exchange Communication Systems (PECS) in improving speech performance in children with Autism Spectrum Disorders (ASD) (Johnson Smith, and Davis 2022). According to Table

1 below, the interviewed eight (8) instructors with two instructors per group to gather diverse perspectives about ASD. The final part of the study outlined the qualitative results derived from the analysis of thematic from these interviews, which were focused on seven main questions that to study the effects from PECS and speech-related disorders as well as testing an idea for a framework. During the interviews, instructors discussed their observations and experiences about the efficacy of PECS in improving the ability to speak for children suffering from ASD. The interviews yielded a large collection of information that could be analyzed using transcription of the verbatim transcript. Thematic analysis was employed to examine the transcripts of the interviews and identify themes, trends and patterns in the information. This technique allowed for an extensive exploration of teachers' views and gave insight into the efficacy and effectiveness of PECS in improving the ability to speak. The data were codified and categorized into themes and then refined to present the principal conclusions. A case study which used thematic analysis to examine the efficacy in the use of PECS is the study conducted by the duo of Al-Ghabban and Moore in the year 2013. The study they conducted investigated the experiences and views of teachers who employed PECS in the classroom with children who have autism spectrum disorders (ASD) within the United Arab Emirates. The analysis of thematic themes in this study identified a number of key aspects that relate to the effectiveness of PECS. Teachers shared that PECS helped in the development of the development of language and communication skills among children suffering from ASD. They highlighted the ways in which PECS allowed children to express their preferences and needs, which in turn, enhanced their ability to communicate and speak effectively. Through an analysis of thematics, Al-Ghabban and Moore gained important insights into the effects on the impact of PECS in speech development and provide evidence of its effectiveness in improving communication skills of children suffering from ASD.

Details	Venue
Peninsular Malaysia (Private Sector)	Interview with instructors from The National Autism Society Of Malaysia NASOM, 25A-5, Setia Avenue Jalan Setia Prima SU13/S, Section 13 Setia Alam, 40170 Shah Alam, Selangor Darul Ehsan
Peninsular Malaysia (Government Sector)	Interview with instructors from Sekolah Kebangsaan Pendidikan Khas Selangor, Jalan Pinang Raja 18/2, Seksyen 18, 40200 Shah Alam Selangor Darul Ehsan



Borneo Malaysia (Private Sector)	Interview with instructor from Kuching Autistic Association KAA, Lorong Desa Wira 15, Taman Desa Wira, 93250 Kuching, Sarawak
Borneo Malaysia (Government Sector)	Interview with instructors from National School of Special Education Kuching Jalan Kolej 93200 Batu Latitude of Kuching, Sarawak

Table 1: Interview locations and sectors

In this case study, researcher used thematic analysis to examine the effectiveness in the Picture Exchange Communication System (PECS) in two different contexts both in the private and government sectors. The research was focused on schools located in Peninsular Malaysia and Borneo, Malaysia choosing schools with the highest percentage of autistic students in each of the sectors to guarantee an adequate sample size as well as knowledgeable instructors. To aid in the analysis for the study, the researcher gathered data from schools that had an excellent score of students, which indicates that they have skilled and knowledgeable instructors. This method was designed to provide important insights into the effect of PECS on the ability to speak in children who suffer from Autism Spectrum Disorder (ASD). The analysis of the thematic results revealed several major themes. First it was evident that there was a focus on the importance of visual information when it comes to the implementation of PECS. The study revealed that visually-based aids as well as the exchange mechanism of PECS proved particularly efficient in aiding communication among children suffering from ASD. The analysis also revealed the effect of PECS on the social interactions and communication between the children. Utilizing PECS was found to have a positive impact on the ability of children to interact with others and communicate effectively. Furthermore, the study revealed the importance of personalization in treatments for children suffering from ASD. The ability to tailor interventions to each child's individual requirements and preferences proved to be vital to maximize the advantages of PECS. The framework proposed for the study was confirmed through an analysis of the themes identified. The validation process increased the validity and reliability of the research findings which made the findings more reliable and valuable.

In sum, this study used thematic analysis as well as qualitative data analysis methods to study the efficiency of PECS in enhancing the ability to speak for children suffering from ASD. The qualitative data gathered from interviews with instructors enhanced the research design and gave deeper insight into the experiences and perspectives of those working with

children suffering from ASD. These findings add to the research in this field and provide helpful guidelines for the development of therapy for communication that is specifically tailored to the requirements of children suffering from ASD. The research questions were the basis for the interview and covered different aspects of the prior knowledge about the effect of PECS on speech utterance skills in children suffering from ASD. The research sought to determine the impact of auditory input and visual input, the improvement of communication and social interaction as well as the effects on self-stimulatory behaviours and the need for continuous PECS use, as well as the comparability of effectiveness and suitability of PECS in conjunction with other assistive systems. Thematic analysis was used to examine the qualitative information that were gathered in the conversations. The analysis started with a familiarization of the data by reading and rereading transcripts of the interviews. Open coding was then employed to find pertinent concepts, phrases or text chunks. These was assigned codes for descriptive purposes that were derived by the data. The codes were later separated based on the similarity of either the structure or content to form possible themes. The themes were refined and redesigned to ensure that they accurately represented the information and addressed the essential elements that were the focus of research. The repeated process of the coding process and themes development produced a coherent collection of themes that summarized the major findings of the interviews. The research findings section included these themes as well as insight into the research questions. The qualitative information gathered from interviews illuminated the effectiveness for PECS as a tool for communication for children suffering from ASD and revealed the degree to which it helps improve the ability to speak. The study provided a variety of important results. The significance of visual information in aiding communication and improving speech utterances came out as a significant topic. Participants stressed the importance of tools that are visual like PECS to aid ASD children's question as follows:



Type	Aspect	Questions	
Self-Efficacy (Affective)	Mastery experiences	1.	As an instructor, do you always mastery the experience of using special visual aids for autistic children? If Yes, explain how
	Vicarious experiences	2.	How do you observe the achievement results of children with autism in the use of PECS?
	Verbal persuasion	3.	What is the best way to communicate with an autistic child other than PECS?
	Physiological and affective states	4.	How might PECS help autistic children learn to express their emotions?
Attitude (Affective)	Idea	5.	Is it feasible to assess a child's ability of conceptual development of speech utterance while using PECS with them?
	Beliefs and values	6.	What are the attitudes of autistic children towards speech utterance learning through the use of PECS?
	Perceptions	7.	Have you ever dealt with an autistic child who was uncooperative and didn't respond well to communication of using PECS? If so, be specific

Table 2: Interview question

4. Results and Finding

The purpose of the interview was to investigate different aspects of the prior knowledge about the effects and impact Picture Exchange Communication Systems (PECS) on the ability to speak in children who suffer from Autism Spectrum Disorders (ASD). These interviews were guided by a set of study questions that addressed subjects that required an extensive understanding of statistics of measuring techniques, understanding integration and application. These questions sought to comprehend the importance of auditory input and visual center, the improvement of social interactions, verbal or non-verbal interactions, self-stimulation behaviors as well as the necessity of constant PECS use and the efficacy of PECS when compared with others assistive technologies. Additionally, the study analyzed the viewpoints of a variety of intelligent informants to give a complete and balanced understanding of the phenomenon. This method increases the credibility and reliability of the findings because it reflects a variety of perspectives and experiences that are that

are related to the research subject (Hammersley and Atkinson 2007).

Then, an open-coding method was used, in which the relevant terms, phrases as well as text fragments, were identified. These concepts and sentences were assigned codes descriptive of. The codes were created directly from the data, rather than being defined. The codes were then grouped according to similarity in structure or content which led to the development of possible themes. The themes were constantly analyzed as well as refined so that that they accurately reflected the data and were able to address the most important aspects of the research questions. Through the process of code and themes development the result was a coherent collection of themes was created which summarized the major results of the interviews. In the conclusion section of the study the themes were discussed in conjunction with an analysis of the same and provided clarification of what the researchers were looking for. The qualitative data gathered from the interviews gave valuable insights on the efficacy in the use of PECS as a tool for communication for children suffering from ASD as well as shedding some



light on the extent to the extent that PECS improves speech utterance for this group.

The study revealed several important areas. It firstly, it highlighted the importance of visual information in aiding language and increasing the effectiveness of verbal expressions. Participants stressed the importance of visual aids, such as PECS for aiding ASD children's understanding and effective expression. In addition, the study examined the effects that PECS upon the development of nonverbal and verbal communication. The results showed that PECS not only improved speech output, but additionally contributed to the development of nonverbal communication abilities, including gestures and body language. The study also looked into the ways in which PECS could aid social interaction, and revealed that it could facilitate positive social connections between childrens ASD and their peers in communication. In addition, the study looked into the effect that PECS on self-stimulatory behavior and found that it reduced stereotyped or repetitive behaviors that are often related to ASD. The consistent

and systematic implementation of PECS was observed to lead to more evident gains in the speech utterance proficiency. Furthermore, the study assessed the effectiveness and efficacy of PECS in comparison to other assistive technology. The findings highlighted the distinct advantages of PECS for example, its visual nature as well as its ability to adapt to individual needs, establishing it as an essential communication device for children suffering from ASD. The analysis of the theme of qualitative data gathered from the interviews highlighted the effects of PECS on the speech utterance ability for children with ASD which highlighted that the significance of seeing inputs, the effect on nonverbal and verbal communication, the increase in interactions with others, decrease in self-stimulatory behaviours as well as the necessity of regular use, and the effectiveness and suitability of PECS when compared against other adivive devices. These findings are part of the current body of research regarding communication therapies that are specifically designed to meet the needs of children who have ASD.

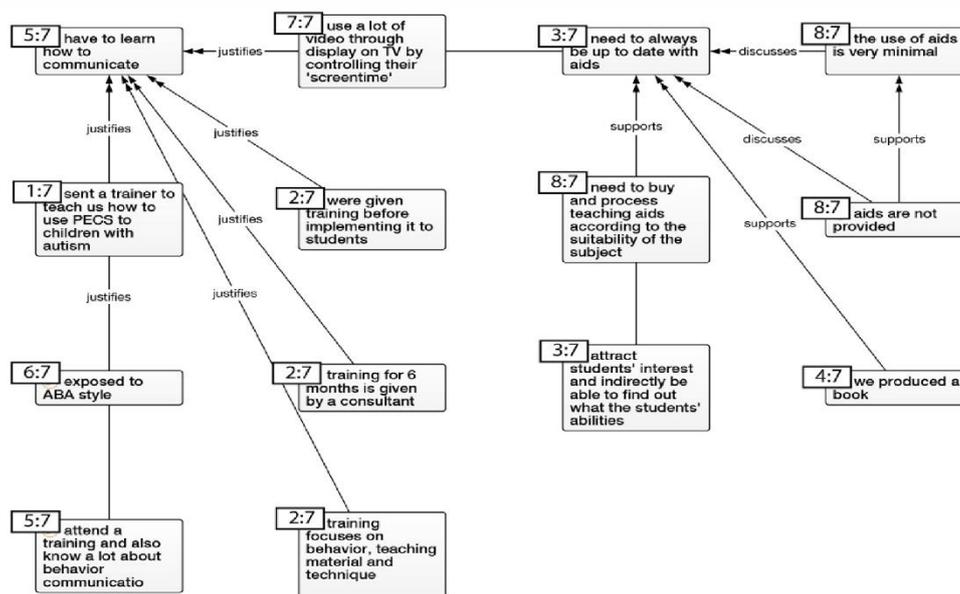


Figure 2: Network Mapping for Interview Question 1

The researcher asks the instructor a question based on Figure 2 affective questions that look at the self-efficacy of autistic “As an instructor, do you always mastery the experience of using special visual aids for autistic children? If Yes, explain how?”. The instructor's personal expertise in the field of special needs education is also mentioned in this question. The findings from the data demonstrate that instructors must develop their communication skills

with the autism community, and the majority of the informants support this finding by stressing how important it is for them to take special education preparation courses before working with autistic children. The instructor must, however, constantly stay current with aids and discuss these educational demands. The answer to this question proves that the informant responded based on experience along with institutional requirements. According to informant 5,



who provided the response, instructors must learn how to communicate with autistic children. This response was affirmed by informants 1, 2, 6, and 7. This demonstrates the importance of instructor exposure and training in assisting this target group. The need for teaching aids must also be kept up-to-date as well. This was stated by informant 3, who was supported by informants 4 and 8, who agreed that the improvement of aids for autistic children must grasp and satisfy their interest. The instructor must also keep up with aid

developments, and it is discussed that the effective aids are necessary for education in order to benefit autistic children. Therefore, in order to assist autistic children, a instructor must also have a basic understanding of their needs. This supports an instructor's mastery experience and, in turn, their ability to influence how autistic children develop their sense of self-efficacy. The proper exposure to special education knowledge is crucial for aiding in the development of autistic children.

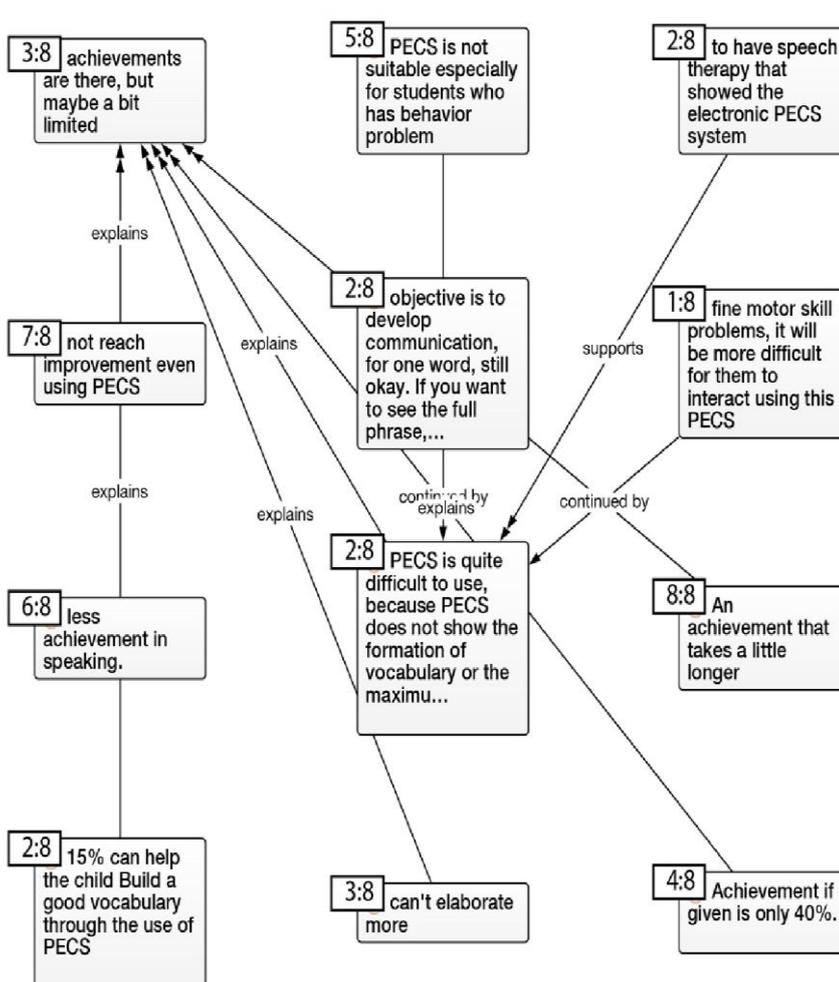


Figure 3: Network Mapping for Interview Question 2

For the data in Figure 3 is based on the question "How do you observe the achievement results of children with autism in the use of PECS?". The informant's response indicated that some progress had been made, though somewhat modestly. And the reason for this response is that utilizing PECS does not result in significant improvement for autistic children. When they are unable to elaborate on a sentence while speaking, this is a category. The information is further

supported by statements made by informants, who emphasise that PECS is challenging to use and not appropriate for students whose behaviour development is progressing slowly. According to Informant 3, achievements occur, but they are possibly limited. This response was explained by four informants, namely informants 2, 4, 7, and 8, who also stated that children with autism do not improve and achieve less in terms of vocabulary formation. The



answer from informant 7 is also explained by the answers from informants 6 and 2, who each state that they have less achievement in speaking and that only 15% of autistic children can benefit from the use of PECS. We can see from informant 2's response that PECS is difficult to use because it does not show the formation vocabulary. This response appears to be continued by informant 1's response, which states that children with autism who have very slow progress in fine motor skills will find it more difficult to interact using PECS. Response informants' answers clearly show that if improvements are not made, it will take a little longer

to see progress. This is related to the motor skill capacity of autistic children, which must also be taken into consideration when implementing assistive devices. In order to ensure autistic achievement, various factors must be considered, especially when it comes to enhancing speech utterance. The necessity for tools that can help researchers expand their vocabulary is one of the things they might emphasise. There is also a need for more interactive tools that use the proper electronic medium. In fact, it's critical to underline how much support autistic children need as they develop their abilities, particularly in the area of motor skills.

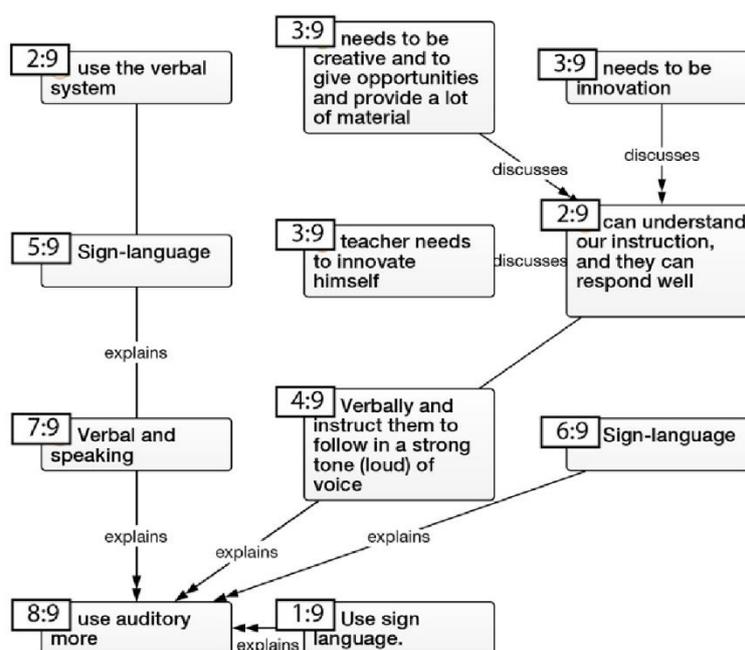


Figure 4: Network Mapping for Interview Question 3

“What is the best way to communicate with an autistic child other than PECS?” is the basis for the data shown in Figure 4 above. The information above demonstrates that the informants are aware that using an auditory approach to learning increases achievement. The majority of interviewee responses about needed of verbal persuasion, which suggest that the use of verbal and sign language demonstrates the outcomes and feedback that children with autism experience, also explain this. It would be preferable if an innovation were carried out with greater creativity, according to attention to the outcomes of the employment of PECS. When looking at informant 8, the suggestion to use auditory more is supported by the answers of informants 1,4,6, and 7. Other than PECS, they explain that using sign language along with verbal instructions is the best way to

communicate with an autistic child. According to informant 4, it is preferable to instruct autistic children verbally and loudly. His response was also discussed by informant 2, who stated that autistic children can understand instruction and respond well when supported by informant 3, who stated that instructors must innovate teaching aids. This is supported by informant 3, who also stated that the instructor should be more creative in selecting materials for this group. According to the study, an innovation integrating sign language coupled with auditory, such as verbal speaking, is required to increase their achievements, particularly in the development of speech and ensure their vocabulary is better. Perhaps more information about this disclosure has to be provided to carers who frequently work with autistic children who actually a



strong support need structure in order to build self-efficacy.

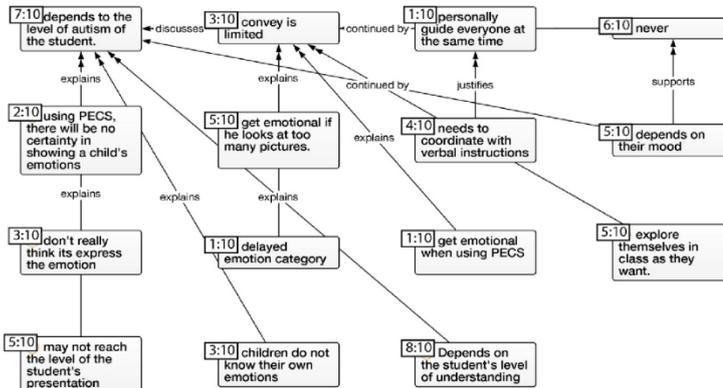


Figure 5: Network Mapping for Interview Question 4

Based on Figure 5 above, the question "How might PECS help autistic children learn to express their emotions?". Based on the physiological and affective states of children with autism, informants discussed this question. One of their basic requirements for receiving good education is this. As was mentioned, emotional development is psychologically disturbed in autistic children at this age. According to the findings, the level of autism category determines whether or not this group will accept the usage of PECS. This is also highlighted in relation to the limited ability of PECS to communicate with autistic children's emotional categories in support of its use. The efficiency of employing PECS is also indirectly impacted by the emotions that influence their mood. The response from informant 7 clearly confirms the belief that the answer to this question is dependent on the children's level of autism. This was explained by informants 2, 3, 5, and 8, who all said the same thing about their level of understanding and emotions, which cannot be quantified. In response to informant

2's statement that using PECS will result in no showing of emotions, informant 3 stated that autistic children do not believe it is possible to express emotions. This statement was continued by informant 5, who responded that he might not be able to reach the level of the students' presentation. Furthermore, as indicated by informant 6's response of 'never,' PECS assist autistic children in learning to express their emotions. This response was supported by informant 5, who also paid attention to the mood of autistic children at any given time or situation. All of them have the ability to influence their mood, which explains the emotions they express. The researcher's perception of the significance of autistic children's emotions was changed by this physiological condition. Every tool designed for them to use as a resource for self-efficacy development must work well together. All instructors need to be made aware of the fact that this group requires an appropriate window of time to receive materials and aids.

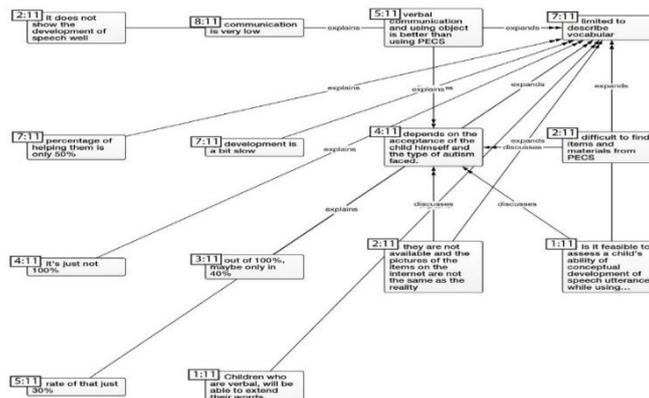


Figure 6: Network Mapping for Interview Question 5



Based on the affective -related questions that look at the idea, the above figure is the data of the question "Is it feasible to assess a child's ability of conceptual development of speech utterance while using PECS with them?". Data indicate that informants spend more time using a limited vocabulary to describe things in order to improve communication. The impact of PECS use on speech development is rated rather poorly. The proportion of slow developing autistic children's self-efficacy, as evaluated by informants, is relatively low. The data also reveals that the sort of autism experienced and the child's acceptance of it both play a role. Figure 6 clearly depicts informant 7's response as a main theme whose response is dominant in the questions being asked to the instructor. Most informants agree with the answer that children with autism have a limited ability to describe their

vocabulary. If observed, informants 1, 2, 3, 4, and 7 each explain the percentage development in speech utterance that is less when PECS is used for children with autism. Informant 4 also stated that it is dependent on a child's acceptance. Informants 2 and 5 discuss this statement, asserting that verbal communication with objects is better compared to PECS. Relate all of the respondents' responses that explain the affective development that happened with the use of PECS. This also has an impact on other accomplishments because of the way autism children behave, which impacts how well educational aid works. Therefore, a less accurate assessment is the outcome of a number of unreliable criteria when evaluating the speech development of autistic children.

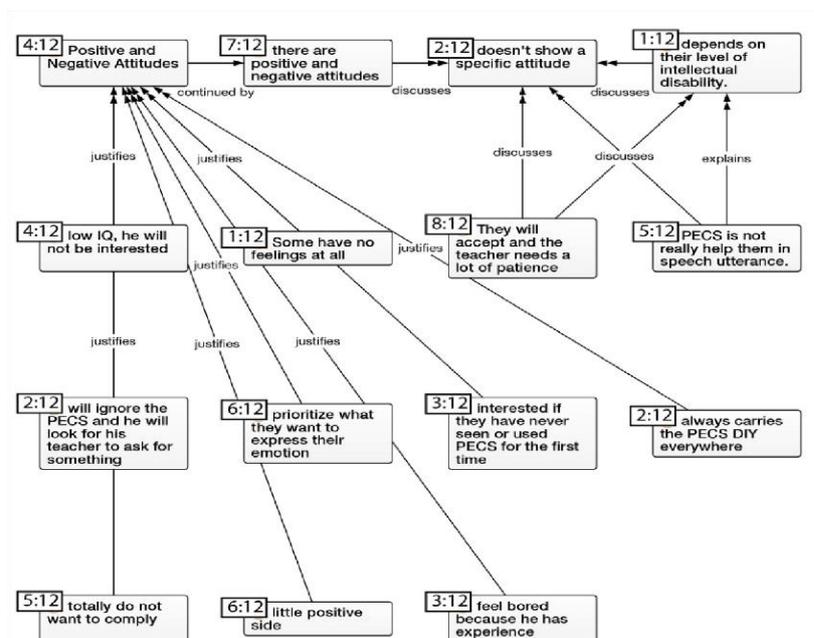


Figure 7: Network Mapping for Interview Question 6

The data in figure 7 is based on the question "What are the attitudes of autistic children towards speech utterance learning through the use of PECS?". This belief and valuebased question provides evidence of the self-efficacy of autistic children. This category presents both positive and bad circumstances as potential outcomes. The responses provided by informants who consider the sort of intellectual ability of the autistic group support this as well. Some autistic children respond well to the instructor's patience when dealing with their challenging demeanour. Autistic children's attitudes towards speech utterance learning with PECS received both positive and negative responses. This is based on the responses of informant

4, who received justifications from informants 1, 2, 3, 5, 6, and 7, each of whom gave an opinion that could be justified by the fact that all of them were subject to IQ ability. Experience is also important in assisting these children in developing their intellectual abilities, which in turn affects their attitudes. According to informant 2, this group of lecturers has a specific attitude, and this topic was discussed by informants 1, 5, and 8, who each thought that the flaw in the use of PECS was due to intellectual disability as well as the instructor's need to be patient in educating this group. Therefore, it is possible to consider this section as missing information about the attitudes of autistic children about learning speech utterances while using



PECS. This also refers to the approach the instructor used to determine a particular degree of belief and values in a child with autism. It's also important to prevent this group from becoming overly dependent

on one particular tool so that their growth in self-efficacy may be tracked over initially contains that of normal children.

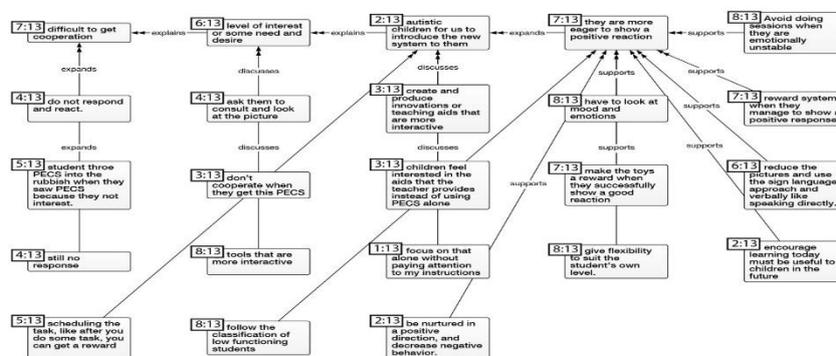


Figure 8: Network Mapping for Interview Question 7

The information in the Figure 8 above comes from the last question in interview sessions towards instructors, "Have you ever dealt with an autistic child who was uncooperative and didn't respond well to communication of using PECS? If so, be specific?". Regarding the view of autistic children's acceptance of the instruments utilised, it is important to consider this question. Autism-related children's attitudes indicate that they are more likely to become angry than to react positively. Answers from informants who discuss emotion and response when using PECS also support this. Additionally, informants address the issue of autistic children finding it challenging to gain their participation during PECS use sessions. In order to improve PECS, additional options are required, such as a reward system and flexibility to accommodate autistic children at their own acceptance level. Therefore, when utilising assistance, teachers must also be aware of the attitudes of these children. Informant 7 stated that they are angrier to show a positive reaction because they are uncooperative and did not respond well to communication using PECS from children with autism. This response appears to have the same meaning as informants 2, 6, 7, and 8. Informant 2 adds to this response by stating that autistic children must be involved in the implementation of the new system. This response was also discussed by informants 1 through 8, the majority of whom agreed with each other. When using the support material, the instructor must carry out a variety of reaction preparations. The efficacy of the tools and strategies used to improve them must always be monitored to ensure that they consistently result in good development. It is necessary to be patient when educating this group. A conclusion that can be drawn

from the discussed question is that autistic children have varying levels of acceptance for various technologies. The instructor must do a variety of reaction preparations when using the support material. To ensure that the tools and strategies used to improve them constantly result in good development, efficacy must always be monitored.

5. Discussion

The study presented in this study investigates the efficacy that the Picture Exchange Communication System (PECS) in enhancing the speech abilities of children with Autism Spectrum Disorders (ASD). The research method employed quantitative and qualitative methods using deep-dive interviews with autism instructors from a variety of centers as the main source of data. Thematic analysis was employed to determine themes and patterns in the conversations, revealing useful insights into the effectiveness for PECS for communication tool for children suffering from ASD. The theory that has been established from earlier studies reveals the importance of visual information and its aids in enhancing communication and speech utterances among children suffering from ASD. PECS has been shown to be a contributing factor not just to improving the development in speech production, but in addition to the growth of nonverbal communication abilities and social interaction skills. Furthermore, PECS has shown potential in reducing self-stimulatory behaviours that are associated with ASD. This is consistent with previous studies demonstrating the effectiveness of visual aids in helping children suffering from ASD in communicating effectively.



In light of the latest research findings, this study highlights the importance of dealing with both affective aspects of communication problems as well as the motor skills required for speech production. The study examines the effects of PECS on emotional development as well as vocabulary improvement and speech utterance skills for children suffering from ASD which sheds some light on its potential to be an effective communication intervention. The second paragraph confirms the theory-based knowledge derived in previous studies, focusing on the importance of visual aids as well as PECS in helping to improve the ability to speak for children suffering from ASD. This is in line with previous research that has highlighted the importance of visual aids in therapy for communication among individuals who suffer from ASD. In terms of the latest research findings, this study draws focus on the effects on the impact of PECS to improve nonverbal communications as well as social interaction capabilities for children suffering from ASD. This study highlights the broad scope of PECS as a means of communication that addresses a variety of communication issues within this particular group. The evidence that is of the study is based around thematic analysis of the interviews with teachers from various autism centers. The main themes identified from this study are the focus in visual details, the effects of PECS on communication and social interaction and the personalization component of treatment for children suffering from ASD. These issues provide important information about the effectiveness of PECS in helping improve speech utterance abilities and the influences on the results. The research methodology that was used in the study mixed qualitative and quantitative techniques using deep-dive interviews to collect qualitative data collection, and using an experimental pre-test/posttest method for the analysis of quantitative data. Thematic analysis enabled a thorough investigation of the instructors' perspectives and experiences using PECS as well as the experimental design allowed for a better understanding of the effectiveness of PECS when compared to other assistive technologies.

The information learned from the study demonstrates the necessity of taking into account both motor and affective skills in the design of communication programs for children who suffer from ASD. The study shows that PECS does not just improve speech output, but helps with non-verbal social communication abilities and social interaction. The study also points out the need for instructors to be provided with the appropriate instruction to implement PECS and assist children who suffer from

ASD with their language development. In conclusion, this study provides important insights regarding the effectiveness of Picture Exchange Communication System (PECS) in enhancing speech skills in children suffering from Autism Spectrum Disorders (ASD). The study confirms the importance of visual aids as well as PECS to aid in communication and demonstrates its potential in the treatment of motor and affective issues in the field of communication therapy. Based on both theoretical information as well as empirical evidence this study highlights the importance of individualized interventions that meet the unique requirements of children suffering from ASD. Continuous research and collaboration in this field is essential to improve communication therapy for this particular population and enhance the quality of their lives overall.

6. Conclusion

In conclusion, this study has explored the impact of the Picture Exchange Communication System (PECS), specifically the Visual-Spatial technique, on the affective progression of speech utterances in children with Autism Spectrum Disorder (ASD). The findings have highlighted the importance of addressing both the affective aspects of communication difficulties and the motor skills involved in speech production. The study's results have emphasized the significance of incorporating visual information and aids in facilitating communication and improving speech utterances in children with ASD. PECS has been found to contribute not only to the development of speech output but also to the growth of nonverbal communication skills and social interaction abilities. Moreover, PECS has shown potential in reducing self-stimulatory behaviors associated with ASD. Consistent and organized implementation of PECS has been found to yield noticeable improvements in speech utterance competence. The thematic analysis of qualitative data obtained from interviews with instructors working with children with ASD has provided valuable insights into the effectiveness of PECS as a communication tool. The study has validated the proposed framework and addressed various research questions, including the role of visual input versus auditory input, the impact on social interaction and communication, the reduction of self-stimulatory behaviors, the necessity of consistent PECS use, and the comparative suitability and effectiveness of PECS with other assistive systems. The findings of this study contribute to the existing body of knowledge on communication interventions for children with ASD. They offer guidance for the



design of tailored interventions and treatment plans that address the specific needs of this population. By considering the affective development, speech utterance, and vocabulary enhancement in children with ASD, interventions can be designed to effectively support their communication abilities and overall development. It is crucial for instructors and educators to have a solid understanding of the unique needs of children with ASD and receive appropriate training to maximize the benefits of communication tools like PECS. Continued research and collaboration in this field are necessary to further refine and improve communication therapies for children with ASD, ultimately facilitating their language development and enhancing their quality of life. The study has a few limitations that should be recognized. First, the results are based on an exclusive sample of children diagnosed with Autism Spectrum Disorder (ASD) from select school within Peninsular Malaysia and Borneo, Malaysia. The small sample might not represent the full range of children who suffer from ASD which means that the generalisability of the results to a wider sample of children diagnosed with ASD might be limited. Furthermore, while the study was focused on schools with a significant amount of autistic children however, the total sample size could be quite tiny. A larger and diverse sample size could have provided greater depth and detail into the effect on the Picture Exchange Communication System (PECS) on speech development for children with ASD. Additionally, the differences in training and experience of the instructor might have influenced the outcome from the program. Although efforts were made select instructors with extensive knowledge, the differing degrees of experience among them could be a source of confusion that should be taken into consideration when making decisions about the outcomes.

Future research into the field of intervention for children suffering from Autism Spectrum Disorder (ASD) will address a variety of important issues. Studies that follow up for a long time are crucial to understand the long-term impacts on PECS. Picture Exchange Communication System (PECS) on speech development and communication abilities among children suffering from ASD over long durations. This kind of longitudinal study could provide useful information on the long-term benefits of PECS in aiding communication. Also, conducting comparative research to assess the effectiveness of PECS when compared with other intervention methods or assistive technologies could give an understanding of its advantages and drawbacks. Comparative studies can assist in determining the best treatment for children who have ASD according to the specific needs of their

communication and capabilities. Cultural aspects also merit consideration in future research. Studying the influence of culture aspects on the effectiveness of PECS could aid in the development of strategies for communication that are sensitive to cultural contexts and are designed to be specific to the contexts of each culture. This will increase the effectiveness and efficacy of the communication therapies offered to children suffering from ASD of diverse cultures. In addition, understanding the importance the parental role in the implementation of PECS and assisting with communication development for children with ASD is essential. Examining the impact of parental involvement on the effectiveness of PECS can help inform the design of comprehensive interventions which include parents as active participants in the therapy process. Alteration as well as developmental stage are crucial elements to be considered when implementing communication strategies for children who have ASD. Future research should explore the impact of the child's age as well as developmental level on efficacy of PECS and provide guidelines for the right time and frequency of interventions to meet evolving needs of children at various levels of development. In the end, adopting the mixed-methods approach for future research will provide an improved understanding of the effect that PECS in influencing speech development for children with ASD. The combination of quantitative measures with qualitative data can allow a more thorough study of the different aspects and experiences that affect its effectiveness PECS as a communication aid for this particular group. If we can address these issues in the future and studies, we can expand our understanding and increase the effectiveness of communication therapies for children suffering from ASD and improve their communication abilities and their overall level of living.

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