

## RESEARCH ARTICLE

# School functional assessment: performance in functional communication among special education at school

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## Abstract:

Functional communication is a critical skill used in school and students with special needs often have difficulties performing compared to their peers. The School Function Assessment (SFA) is able to contextually measure the performance of functional skill in special needs students and compare them between their peers within the Special Education Integration Program (SEIP) classes using the norm-referenced criterion scores. 63 special needs students of eight different disabilities between ages seven to nine years old were assessed by their teachers in this research using the SFA (Part III) to investigate the relationship between age, gender and diagnosis with overall activity performance and performance in functional communication. The findings discovered that special needs students perform generally poorly across all components of SFA (Part III) and specifically in functional communication. There are no significant differences between gender ( $p=1.000$ ) and ages ( $p = 0.095$ ) with functional communication. There is also no significant differences were found between activity performance in functional communication and diagnosis ( $p=0.075$ ). This research will increase understanding about the functional skill skills of special needs students of different age, gender and diagnosis and enable educators and therapists alike to plan effective interventions for the students.

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## 1. INTRODUCTION

In this new era of science and technology, education is important for all people including those with disabilities. Education plays a huge role in a person's life such as individual development and nation building [1]. Education involves academic, non-academic and educational activities. School is one of the essential places where the educational process can be accomplished. In schools, students' abilities are measured through their school performance which an issue that deeply concerns students, parents, teachers and authorities in Malaysia and other countries. School performance is described as the results shown by the students of what they have learned and usually measured through school grades [2]. However, children with disability are acknowledged to encounter hurdles in school compared to peers despite their phenotype disability [3]. On the other hand, school performance also can be measured through activity performance at school. Activity performance can be described as the student's ability to initiate and achieve specific functional school-related activities that are classified by the general task area [4].

School functions will give a significant impact on students' successes and difficulties [5]. School activity limitations and less participation by students with special needs than by their typically developing peers is commonly reported [6]. Similarly, students with disabilities often have difficulty meeting performance expectations in school because physical, cognitive, or social impairments affect their ability to participate actively in classroom learning activities,

express their knowledge clearly, and to interact with their peers [7].

From a human right perspective, education is an intrinsic right which possessed by every individual regardless of their status and background [1]. Children with special needs have the right for quality education which involves not only academic subjects but also skills development that can help them survive in the challenging 'real world' in the future [8]. In fact, special education concern with any necessary services or approach for children with various forms of disabilities and also concern with the learning of gifted children and other marginalized children [1]. Besides, the main aim of special education integrated program is to ensure that students with special needs can learn in the least restrictive environment and also be able to develop their social and communication skills effectively [8].

The effective communication increases the effectiveness of students' performance [9]. This stressed the importance of communication in the educational process. Communication education helps to develop the ability to communicate with an array of different types of people in different situations including peers, parents and teachers [10]. Next, communication as a key to successful collaboration in all educational environments. In addition, according to [11], a robust and comprehensive communication system provides students with the ability to convey a rich range of communicative functions, promoting academic and social inclusion across their school day. Moreover, a transactional process of ongoing verbal and nonverbal behaviors from a

minimum of two people is known as communication [12], where one person responding accordingly after another person initiating the communication [13]. Communication enhances the quality of classroom instruction and is key to successful collaboration in educational environments [14]. The main focus of this study is to determine the performance of functional communication among special education at school.

## 2. MATERIALS AND METHODS

### 2.1 Participant sampling

A mixed-method sampling was conducted where random sampling was used for the schools within Petaling Perdana, Selangor and a convenience sampling was done within those schools to choose appropriate and suitable students for the study. The criteria to be included in the study were primary school students with special needs aged between 7 to 9 years old and attend school at least 3 times a week. Teachers (who will be assessing the students) must be able to understand English and have at least three years' experience in teaching special needs students. Participants who were excluded were special needs students with multiple disabilities other than learning disabilities (deaf and blind).

### 2.2 Instruments

#### 2.2.1 Demographic questionnaire

Information on the name, age, gender and specific disability of the sample being assessed is recorded. The assessor may provide extra information such as secondary health conditions, personal observations or notes from visiting community Occupational Therapists if deemed appropriate and reasonable. This questionnaire is in simple English to ease the process of answering.

#### 2.2.2 School Function Assessment (SFA) (Part III)

The School Function Assessment (SFA) is a criterion-based assessment that can be administered through observation and without active participation of the student. It is given in English and fully explained to the assessors prior to data collection to ensure the measure is understood. The measurement was chosen due to its ability to measure the school function of a special needs' child in their school and have the results be comparable to a set norm provided [7]. SFA comprises three parts which are Part I: Participation, Part II: Task Support and Part III: Activity Performance. Only Part III of the assessment is used in this research as it focuses on rating the activity performance of the special needs' child with or without assistance.

There are two types of activity to observe and measure which are then further broken into specific tasks such as Travel, Maintaining and Changing Positions, Recreational Movement, Manipulation with Movement, Using Materials, Setup and Cleanup, Hygiene, Eating and Drinking, Clothing Management, Up/Down Stairs, Written Work, Computer and Equipment Use, Functional Communication, Memory and Understanding, Following Social Conventions, Compliance with Adult Directives and School Rules, Task

Behavior/Completion, Positive Interaction, Behavior Regulation, Personal Care Awareness and Safety.

The tasks Up/Down Stairs and Computer and Equipment Use were not included in the overall assessment for this research due to limitations and physical structures of the school buildings in which this research was carried out. Furthermore, this research will focus more specifically on the functional communication aspect of the assessment.

### 2.3 Assessment of participants

Special education teachers are to assess students within their class that fits the criteria of the study. The teachers only need to report on normal behavior of their students and rate them accordingly on the School Function Assessment Part III. As this does not require the students to follow any extra directions other than their usual in-class directives, it does not interrupt the school schedule in any way. Each teacher is required to sign a consent form prior to beginning the assessment to signify willingness to participate.

### 2.6 Data analysis

The questionnaire will be analysed using Statistical Package for the Social Sciences (SPSS) version 25 in two stages. The first stage is using descriptive analysis for data such as demographic and scores from the questionnaire. The descriptive analysis of the demographic information and the total scores in the barriers questionnaires will be analysed by using mean (SD), or median (IQR: 25% - 75%) depends on the distribution of the data collection.

As for the second stage, an inferential analysis that aimed to identify relationship and to determine whether to accept or reject the hypothesis of the study. The inferential analysis which is types of hypothesis testing depends on the distribution data and types of data obtained. If the data is normally distributed, parametric testing will be conducted such as the t-test or one-way ANOVA will be used to accept or reject the hypothesis. To determine associations between variables, a Pearson correlation coefficient if data is normally distributed or Spearman rho if data is abnormally distributed will be conducted.

## 3. RESULTS AND DISCUSSION

### 3.1 Demographic variables

The table 1 below shows the demographic data of the students such as gender, age and diagnosis. There were 39 male and 24 female students. Next, the age ranged from 7 to 9 years old. The mean age is 8.02 years old. Moreover, there are 27 students with autism spectrum disorder (ASD), 3 students with attention deficit/hyperactivity disorder (ADHD), 8 students with Down syndrome (DS), 12 students with slow learner (SL), 3 students with cerebral palsy (CP), 5 students with global developmental delay (GDD), 3 students with learning disabilities (LD) and 2 students with mental retardation (MR).

Table 1: The demographic data of the students.

Gender	Frequency	Percentage (%)
Male	39	61.9
Female	24	38.1
Age	Frequency	Percentage (%)
7	21	33.3
8	20	31.7
9	22	34.9
Diagnosis	Frequency	Percentage (%)
ASD	27	42.9
ADHD	3	4.8
DS	8	12.7
SL	12	19.0
CP	3	4.8
GDD	5	7.9
LD	3	4.8
MR	2	3.2

### 3.2 The level of activity performance among special education students

SFA divided activity performance into physical tasks and cognitive/behavioural tasks. The mean criterion scores of the students will be compared to the criterion cut-off scores for each specific functional task. The physical tasks including travel; maintaining and changing position; recreational movement; manipulation with movement; using materials; set up and clean up; eating and drinking; hygiene; clothing management; and written work. Moreover, the optional tasks such as up/downstairs; and computer and equipment use are will not be scored since the students not routinely required to perform the task. Besides, the cognitive/behavioural tasks including functional communication; memory and understanding; following social conventions; compliance with adult directives and school rules; task behaviour/completion; positive interaction; behaviour regulation; personal care awareness; and safety.

Figure 1 shows the level of physical tasks performance of the students. Generally, the students achieved scores significantly below that of children their age in all tasks.

This study shows the special education students achieved scores significantly below that of children their age in all physical tasks' performance. The two highest mean criterion scores are maintained and changing position; and travel which more than 75.00. However, both tasks still below each criterion cut-off score which means the students' performance are below of their typically developing peers. While, the four lowest mean criterion scores are written work, hygiene, using materials, and recreational movement which below 55.00. Other than that, the lower the gap different between mean criterion score and the criterion cut-off score of a task shows better ability of students in

performing that task and vice versa. The three lowest gaps different between mean criterion score and the criterion cut-off score in physical tasks are travel; maintain and changing position; and manipulation with movement. Most students have better ability to perform those tasks. While, the three biggest gaps different between mean criterion score and the criterion cut-off score in physical tasks are eating and drinking; hygiene; and clothing management. Most students have lower ability to perform those tasks.

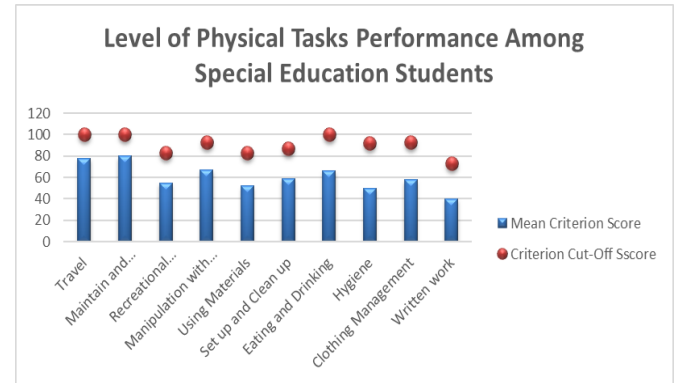


Figure 1: The level of physical tasks performance.

Figure 2 shows the level of cognitive/behavioural tasks performance of the students. Generally, the students also achieved scores significantly below that of children their age in all tasks.

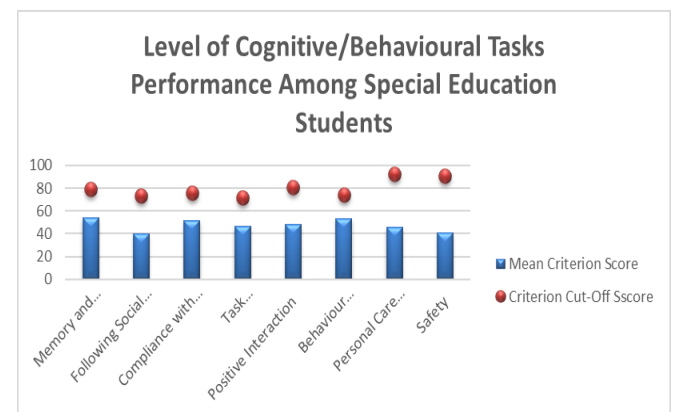


Figure 2: The level of cognitive/behavioural tasks performance.

This study shows the special education students achieved scores significantly below that of children their age in all cognitive/behavioural tasks performance. The three highest mean criterion scores are memory and understanding; compliance with adult directives and school rules; and behaviour regulation which more than 50.00. However, both tasks still below each criterion cut-off score which means the students' performance are below of their typically developing peers. While, the five lowest mean criterion scores are functional communication, following social conventions, task behaviour/completion, personal care awareness, and safety which below 47.00. Other than that, the lower the gap different between mean criterion score and the criterion cut-off score of a task shows better ability of students in performing that task and vice versa. The three lowest gaps different between mean criterion score and the criterion cut-off score in cognitive/behavioural tasks are memory and understanding; compliance with adult directives

and school rules; and behaviour regulation. Most students have better ability to perform those tasks. While, the three biggest gaps different between mean criterion score and the criterion cut-off score in cognitive/behavioural tasks are positive interaction; personal care awareness; and safety. Most students have lower ability to perform those tasks.

Students with disabilities often have difficulty meeting performance expectations in school because physical, cognitive or social impairments affect their ability to participate actively in classroom learning activities, express their knowledge clearly, and to interact with their peers [7]. School activity limitations and less participation by students with special needs than by their typically developing peers are commonly reported [6]. However, there is evidence by study which pointed out that children with struggle with aspects of adaptive functioning in the school setting [3]. As a result, students with DS were reported to demonstrate the greatest challenges with the following cognitive-behavioural activities such as following social convention, functional communication, compliance with adult directives and school rules, personal care awareness, task behaviour-completion, positive interaction, and safety [3]. Other than that, there is no collaboration network with the occupational therapist in hospital and lack of law enforcement in Malaysia resulted to indirect and formal occupational therapy in special education classes [15]. As one of occupational therapy domains is education and implements to develop functional tasks among special needs students.

### 3.3 The level of functional communication performance among special education students

Functional communication is one of a task in cognitive/behavioural tasks. The mean criterion scores of the students will be compared to the criterion cut-off scores for this specific functional task.

Figure 3 shows the level of functional communication performance of the students. Generally, the students achieved scores significantly below that of children their age in this task.

. The functional communication domain measures a student's ability to communicate all types of information to peers and adults. Items include communicates yes/no, acceptance/refusal, or choice between two or more items; "hungry" or "thirsty"; "sick", "hurt" or "help"; need for help with a functional (non-academic) task; first and last name; where something is located in classroom or school; short messages to another person; inquiries/requests for information; short messages from one person to another; basic safety information; describe an object well enough to enable correct identification; where he/she would go or what he/she would do if lost; and complex (3 steps) directions to others. However, this study shows the special education students achieved scores significantly below that of children their age in functional communication performance. The mean criterion scores for this task is 38.97. However, these tasks still below its criterion cut-off score of 91.00 which means the students' performance are below of their typically developing peers. Other than that, the lower the gap different between mean criterion score and the criterion cut-off score of a task shows better ability of students in performing that

task and vice versa. The gap different for this task is 52.03 which more than half of the criterion cut-off score. This shows most students has lower ability in performing this task. Next, this study also shows 92.1% number of students failed in this task. There are 5 students passed with 58 students failed in functional communication task.

This finding shown there is a significant lower of functional communication performance among special education students [16]. Communication enhances the quality of classroom instruction and is key to successful collaboration in educational environments [14]. This statement is supported which improving communication skills allow children to take an active part in social settings and provide them with the tools necessary to engage in meaningful conversations [17]. Communication is often impaired in children with special needs [18]. It is supported that the child's ability to interact and engage with their environment related to these communication difficulties [19]. Moreover, students having problems in verbal communication including in classroom instruction [20]. In the study stressed that symptoms of inattention and hyperactivity typically co-occur with poor communication skills and low level of literacy in children with ADHD [21]. Other than that, reinforces the importance of communication to enhance the organizational life [22]. In addition, classroom teachers can maintain communication skills on these children in natural and unstructured contexts as there is strong correlation exists between communication skills of children and the frequency of communication opportunities [23]. The teachers have to provide frequent communication opportunities for them in the classrooms in order to maintain their communication skills [13].

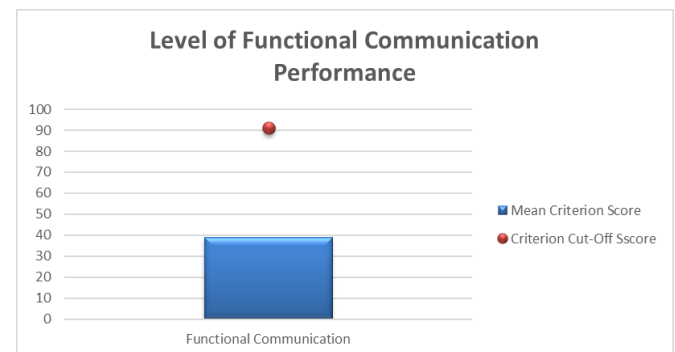


Figure 3: The level of functional communication performance.

### 3.4 The Association between functional communication performance with age

The association between functional communication performance with age is analysed using Fisher's Exact Test since three of the cell's frequency are small. Those cells with an expected count of  $<5$  is 50%. Moreover, the Fisher's exact test used to determine if there are non-random associations between two categorical variables. The variables are criterion cut-off scores of the functional communication performance will be associated with the age of the students.

Table 2 shows there was no significant association between the student's functional communication performance and the

age ( $p=0.095$ ). The proportion of pass student was highest among those with aged 9 years old, while most of the children assessed as being of fail in functional communication performance were from student aged 7 years old.

The age range of the students in this study are 7 ( $n=21$ ), 8 ( $n=20$ ), and 9 ( $n=22$ ) years old. The mean age is 8.02 years old. This study shows there was no significant association between the student's functional communication performance and the age ( $p=0.095$ ). Next, the proportion of pass student was highest among those with aged 9 years old, while most of the children assessed as being of fail in functional communication performance were from student aged 7 years old. Moreover, this study shows only one student aged 8 years old (5.0%) and four students aged 9 years old (18.2%) passed the functional communication task with criterion score above 91. Furthermore, all students aged 7 years old (100.0%) and nineteen students aged 8 years old (95.0%) together with eighteen students aged 9 years old (81.8%) failed in this task. There was no significant association shown since the differences between functional communication performance and age are small.

Table 2: Assessed functional communication performance by age.

Age	Functional communication performance		
	Pass	Fail	Total
7	0 (0.0%)	21 (100.0%)	21 (100.0%)
8	1 (5.0%)	19 (95.0%)	20 (100.0%)
9	4 (18.2%)	18 (92.1%)	22 (100.0%)
Total	5 (7.9%)	58 (92.1%)	63 (100.0%)

$$\chi^2 = 4.313; p > 0.05$$

The hypothesis stated there is an association between functional communication performance with age is rejected. Children learn best when communication is tailored to their specific developmental age, needs and interests [24]. It is not only developmental trends in children's understanding of conversation as a means of communicating and legitimising knowledge but also as the progressive age groups able to understand, the level of conceptual difficulty is vital to each group which requiring more complex contents, contexts and forms [25]. During age of 7 through 10 years, children gradually develop into more independent and capable of exploring the world around them [24]. They are able using more sophisticated language, learn huge amount of new information and acquire new skills including literacy. Furthermore, children have different in abilities and needs at different ages are things to be considered when communicating with them. Thus, there are several principles that can be applied when communicating with children which are communication should be age-appropriate and child-friendly; address the child holistically; and be positive and strengths-based [24].

### 3.5 The difference between functional communication

#### performance with gender

The difference between functional communication performance with gender is analysed using Fisher's Exact Test since two of the cell's frequency are small. Those cells with an expected count of  $<5$  is 50%. Moreover, the Fisher's exact test used to determine if there are non-random associations between two categorical variables. The variables are criterion cut-off scores of the functional communication performance will be associated with the gender of the students.

Table 3 shows there was no significant difference between the student's functional communication performance and the gender ( $p=1.000$ ). The proportion of pass student was highest among female students (8.3%), while most of the children assessed as being of fail in functional communication performance were male students (92.3%).

Table 3: Assessed functional communication performance by gender.

Gender	Functional communication performance		
	Pass	Fail	Total
Male	3 (7.7%)	36 (92.3%)	39 (100.0%)
Female	2 (8.3%)	22 (91.7%)	24 (100.0%)
Total	5 (7.9%)	58 (92.1%)	63 (100.0%)

$$\chi^2 = 0.008^a; p > 0.05^b$$

<sup>a</sup> Pearson Chi Square Test

<sup>b</sup> Fisher's Exact Test

The students in this study were male ( $n=39$ ) and female ( $n=24$ ). This study shows there was no significant difference between the student's functional communication performance and the gender ( $p=1.000$ ). Next, the proportion of pass student was highest among female students, while most of the children assessed as being of fail in functional communication performance were male students. Moreover, this study shows only two female students (8.3%) and three male students (7.7%) passed the functional communication task with criterion score above 91. Furthermore, twenty-two female students (91.7%) and thirty-six male students (8.3%) failed in this task. There was no significant difference shown since the differences between functional communication performance and gender are small.

The hypothesis stated there is a significant difference between functional communication performance with gender is rejected. This finding conflicts with the previous research which found that gender differences between the dyads emerged and it was shown that the different kinds of communication had different effects for the different genders [26]. The study done shows that girls generally use more positive forms of communications while boys use more controlling acts and engaged in more domineering exchanges than girls [27]. Moreover, boys' conversations are characterised by greater independence, competitiveness and dominance whereas girls' conversations are characterised by closeness, cooperation and interpersonal exchange [28]. In addition, mentioned that boys delay behind girls in the development of many communication features [29]. Other

than that, it is emphasize that the effect size of gender on children's language largely depends on their age and the language aspects [29]. In contrary, a study mentioned that generally differences decrease with age [30]. However, "these differences are seldom statistically significant, but the careful observer cannot ignore the amazing consistency with which theses small differences appear in one investigation after another, each being conducted by the different experimenter, employing different techniques, different subjects, and sampling different geographical populations" [31]. Furthermore, a study confirmed the existence of gender differences but it is limited and often interact with a variety of factors such as age [32].

### 3.6 The difference between functional communication performance with diagnosis

The difference between functional communication performance with diagnosis is analysed using one-way ANOVA. Moreover, one-way ANOVA used to determine whether there are any statistically significant differences between the means of two or more independent groups. The criterion scores of the functional communication performance will be associated with the diagnosis of the students. The diagnosis including ASD, ADHD, DS, GDD, MR, SL, CP and LD.

Table 4 shows there was no significant difference between the student's functional communication performance and the diagnosis ( $p=0.075$ ). Generally, all the diagnosis achieved scores significantly below that of children their age in this task. However, the three highest mean criterion scores are among SL, CP and ADHD, while the three lowest mean criterion scores are among GDD, DS and LD. Furthermore, ASD and MR in the middle between the highest and the lowest mean criterion score.

Table 4: Assessed functional communication performance by diagnosis.

Diagnosis	n	Mean (SD)	F-stats (df)	p-value
ASD	27	35.2 (20.1)	1.98 (7)	0.075
ADHD	3	42.0 (18.0)		
DS	8	26.1 (19.0)		
GDD	5	23.6 (26.5)		
MR	2	39.5 (21.9)		
SL	12	59.5 (25.9)		
CP	3	53.0 (41.1)		
LD	3	33.3 (57.7)		

The diagnosis of students in this study are ASD ( $n=27$ ), ADHD ( $n=3$ ), DS ( $n=8$ ), GDD ( $n=5$ ), MR ( $n=2$ ), SL ( $n=12$ ), CP ( $n=3$ ) and LD ( $n=3$ ). This study shows there was no significant difference between the student's functional communication performance and the diagnosis ( $p=0.075$ ). Generally, all the diagnosis achieved scores significantly below that of children their age in this task. Moreover, the

two highest mean criterion scores are SL and CP which more than 52.0. However, both diagnoses still below criterion cut-off score of 91 which means the students' performance are below of their typically developing peers. Furthermore, the four lowest mean criterion scores are ASD, LD, DS and GDD which below 36.0. There was no significant difference shown since the differences between functional communication performance and diagnosis are small.

The hypothesis stated there is a significant difference between functional communication performances with diagnosis is rejected. In this study, mean criterion scores of students with ASD is 35.2 (SD 20.1) which performance below of their typically developing peers. This finding was supported by previous which mentioned that children with ASD have limited communication skills as most of them having difficulty with communication and language as well as social interactions [33]. ASD is characterised by deficits in two core domains which are social communication and social interaction, restricted repetitive patterns of behaviour, interests and activities [34]. Next, mean criterion scores of students with LD is 33.3 (SD 75.7) which performance below of their typically developing peers. This finding is supported by a pointed out that children with SLD pose a real challenge when it comes to communication and have little or no speech [35]. Moreover, mean criterion scores of students with DS is 26.1 (SD 19.0) which performance below of their typically developing peers. This finding is supported mentioned that DS display a relative weakness in communication skills specifically in expressive language and grammar [36]. It is explained in their study that individuals with DS have a characteristic profile of language and communication strengths and difficulties which receptive language is typically stronger than expressive language [37]. Furthermore, a significant delay in two or more domains including gross or fine motor skills, cognition, speech or language, personal or social skills, or activities in daily living [38].

## 4. CONCLUSION

In a nutshell, education students showed poor performance in all activities assessed in SFA, which includes hygiene performance. No significant differences in functional communication performance were obtained among special education students with different age and gender. For diagnosis, result of significant difference was obtained between diagnosis pair of Down syndrome and slow learner, while no significant difference was obtained between other pair of diagnosis.

Student's poor performance in school functional task, including hygiene highlighted the possibility of students to have issue with their development. It also highlights the possibility of the children to have underlying problems with their body functions that limit their engagement in functional activity. The inability to do functional task might be related to physical problems and cognitive problems caused by the disorder/ impairment. Specific evaluations and interventions targeted specifically at the root cause of the problem should be implemented to help special education students to perform better in academic and function activities at school.. This highlights the importance of establishing a specific

individualized educational programme (IEP) that involves multi-disciplinary team at school which includes other profession such as occupational therapy, physiotherapy and speech therapy in order to cater the needs of special education students holistically.

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## REFERENCES

- [1] M. N. Abdul Nasir and A. N. A. Erman Efendi, "Special education for children with disabilities in Malaysia: progress and obstacles," *Geografia: Malaysian Journal of Society & Space*, 2016.
- [2] H. A. Lamas, "School Performance Sobre el rendimiento escolar Citar Como," *Propósitos y Representaciones*, 2015, doi: 10.20511/pyr2015.v3n1.74.
- [3] L. A. Daunhauer, D. J. Fidler, and E. Will, "School function in students with down syndrome," *American Journal of Occupational Therapy*, 2014, doi: 10.5014/ajot.2014.009274.
- [4] W. Coster, "Occupation-Centered Assessment of Children," *American Journal of Occupational Therapy*, 1998, doi: 10.5014/ajot.52.5.337.
- [5] W. Strein and M. Kuhn-McKearin, "School Function Assessment," in *Encyclopedia of Autism Spectrum Disorders*, 2013.
- [6] R. J. Simeonsson, D. Carlson, G. S. Huntington, J. S. McMillen, and J. L. Brent, "Students with disabilities: A national survey of participation in school activities," *Disability and Rehabilitation*, 2001, doi: 10.1080/096382801750058134.
- [7] W. J. Coster, M. C. Mancini, and L. H. Ludlow, "Factor structure of the school function assessment," *Educational and Psychological Measurement*, 1999, doi: 10.1177/00131649921970099.
- [8] M. N. Mohamad Taib, "The Role of Special Classes, Resource Rooms and Other Arrangements in Regular Schools - Meeting Individual Educational Needs while Forming a Cohesive Society," *Journal of Special Education in the Asia Pacific*, vol. 5, pp. 64–68, 2009.
- [9] K. Zuoud and R. Shboul, "The effects of communication skills in developing preparatory tear students' performance," *Academics World 82nd International Conference, Langkawi, Malaysia 18-19 June*, 2018.
- [10] V. A. Reed, K. McLeod, and L. McAllister, "Importance of selected communication skills for talking with peers and teachers: Adolescents' opinions," *Language, Speech, and Hearing Services in Schools*, 1999, doi: 10.1044/0161-1461.3001.32.
- [11] P. Mirenda, "Supporting individuals with challenging behavior through functional communication training and AAC: Research review," *AAC: Augmentative and Alternative Communication*, 1997, doi: 10.1080/07434619712331278048.
- [12] L. B. Olswang, L. Svensson, and S. Astley, "Observation of classroom social communication: Do children with fetal alcohol spectrum disorders spend their time differently than their typically developing peers?," *Journal of Speech, Language, and Hearing Research*, 2010, doi: 10.1044/1092-4388(2010/09-0092).
- [13] M. J. Tsai, "Communication interaction in special education preschool classrooms," *International Journal of Developmental Disabilities*, 2016, doi: 10.1179/2047387715Y.0000000013.
- [14] S. P. Morreale and J. C. Pearson, "Why communication education is important: The centrality of the discipline in the 21st century," *Communication Education*, 2008, doi: 10.1080/03634520701861713.
- [15] M. Zainol and R. A. Majid, "Pelaksanaan Terapi Karakterja Demi Penguasaan Kemahiran Motor Halus Murid Bekeperluan Khas di Sekolah," *Journal of Special Education*, vol. 3, no. 1, pp. 81–91, 2013.
- [16] S. T. Egilson and W. J. Coster, "School Function Assessment: Performance of Icelandic students with special needs," *Scandinavian Journal of Occupational Therapy*, 2004, doi: 10.1080/11038120410020737.
- [17] D. R. Beukelman and P. Mirenda, *Augmentative & alternative communication: Supporting children and adults with complex communication needs*. Paul H. Brookes Publishing, 2013.
- [18] K. Himmelmann, K. Lindh, and M. J. C. Hidecker, "Communication ability in cerebral palsy: A study from the CP register of western Sweden," *European Journal of Paediatric Neurology*, 2013, doi: 10.1016/j.ejpn.2013.04.005.
- [19] J. H. Bensted-Smith, "Participation, Activity Performance and Task Support of Cerebral Palsied Children Aged Between 4 and 12 Years in Mainstream Schooling Environments in Gauteng," Master Degree, University of the Witwatersrand, Johannesburg, 2014.
- [20] L. Abbeduto, "Development of Verbal Communication in Persons with Moderate to Mild Mental Retardation," *International Review of Research in Mental Retardation*, 1991, doi: 10.1016/S0074-7750(08)60104-4.
- [21] E. Hawkins, S. Gathercole, D. Astle, and J. Holmes, "Language Problems and ADHD Symptoms: How Specific Are the Links?," *Brain Sciences*, vol. 6, no. 4, p. 50, 2016, doi: doi: 10.3390/brainsci6040050.
- [22] S. P. Morreale, J. M. Valenzano, and J. A. Bauer, "Why communication education is important: a third study on the centrality of the discipline's content and pedagogy," *Communication Education*, 2017, doi: 10.1080/03634523.2016.1265136.
- [23] J. Sigafoos, D. Roberts, M. Kerr, D. Couzens, and A. J. Baglioni, "Opportunities for communication in classrooms serving children with developmental

- disabilities,” *Journal of Autism and Developmental Disorders*, 1994, doi: 10.1007/BF02172226.
- [24] B. Kolucki and D. Lemish, “Communicating with Children,” 2011. [https://www.unicef.org/cwc/files/CwC\\_Final\\_Nov-2011.pdf](https://www.unicef.org/cwc/files/CwC_Final_Nov-2011.pdf).
- [25] P. J. Leman, “Argument structure, argument content, and cognitive change in children’s peer interaction,” *Journal of Genetic Psychology*, 2002, doi: 10.1080/00221320209597967.
- [26] S. M. Murphy and D. Faulkner, “Gender differences in verbal communication between popular and unpopular children during an interactive task,” *Social Development*, 2006, doi: 10.1111/j.1467-9507.2006.00331.x.
- [27] P. J. Leman, S. Ahmed, and L. Ozarow, “Gender, gender relations, and the social dynamics of children’s conversations,” *Developmental Psychology*, 2005, doi: 10.1037/0012-1649.41.1.64.
- [28] C. Leaper, “Influence and Involvement in Children’s Discourse: Age, Gender, and Partner Effects,” *Child Development*, 1991, doi: 10.2307/1131178.
- [29] S. Adani and M. Capanec, “Sex differences in early communication development: Behavioral and neurobiological indicators of more vulnerable communication system development in boys,” 2019, doi: 10.3325/cmj.2019.60.141.
- [30] B. P. Lange, H. A. Euler, and E. Zaretsky, “Sex differences in language competence of 3- to 6-year-old children,” *Applied Psycholinguistics*, 2016, doi: 10.1017/S0142716415000624.
- [31] D. Mccarthy, “Some Possible Explanations of Sex Differences in Language Development and Disorders,” *Journal of Psychology: Interdisciplinary and Applied*, 1953, doi: 10.1080/00223980.1953.9712848.
- [32] A. Etchell *et al.*, “A systematic literature review of sex differences in childhood language and brain development,” *Neuropsychologia*. 2018, doi: 10.1016/j.neuropsychologia.2018.04.011.
- [33] J. N. Cadette, C. L. Wilson, M. P. Brady, C. Dukes, and K. D. Bennett, “The Effectiveness of Direct Instruction in Teaching Students with Autism Spectrum Disorder to Answer ‘Wh-’ Questions,” *Journal of Autism and Developmental Disorders*, 2016, doi: 10.1007/s10803-016-2825-2.
- [34] K. Y. Teng, “Contributions of Inclusive Education Programme, Teachers’ Attitudes and Efficacy on Social Skills Among Students with Autism Spectrum Disorder,” Universiti Teknologi Malaysia, 2016.
- [35] P. Mutumburanzou, “Communication Skills for Children with Severe Learning Difficulties,” *European Journal of Educational Sciences*, vol. 5, no. 2, pp. 75–83, 2018.
- [36] E. Berglund and M. Eriksson, “Communicative development in Swedish children 16-28 months old: The Swedish early communicative development inventory - Words and sentences,” *Scandinavian Journal of Psychology*, 2000, doi: 10.1111/1467-9450.00181.
- [37] G. E. Martin, J. Klusek, B. Estigarribia, and J. E. Roberts, “Language characteristics of individuals with down syndrome,” *Topics in Language Disorders*, 2009, doi: 10.1097/TLD.0b013e3181a71fe1.
- [38] M. Shevell *et al.*, “Practice parameter: Evaluation of the child with global developmental delay: Report of the quality standards subcommittee of the American Academy of Neurology and The Practice Committee of the Child Neurology Society,” *Neurology*, 2003, doi: 10.1212/01.WNL.0000031431.81555.16.