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The Examination of the Classroom Accommodations to Address Executive Functioning Issues for a Child with Autism Spectrum Disorder in an Inclusive Classroom Setting: A Case Study

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***Abstract*—This paper examines classroom accommodations that can be made to address executive functioning issues of a child with ASD. The case study is on a student named Aydil (pseudonym), 8 years old. Aydil has functioning Autism and is studying at an international school in Malaysia. The aim of this study is to describe and understand classroom accommodations that can be made in addressing executive functioning issues of a child with high functioning autism. Methods of data collection include field observation, observation reports, interview, and reports by professionals for 3 months. Researcher has been the participant's shadow aide/ personal learning assistant for 3 years. Aydil requires all four accommodations, presentation, time and scheduling, response and instructional to address his executive functioning challenges in the learning process. The accommodations aid in improving the quality of Aydil's access to the curriculum.**

Keywords—accommodation; executive functioning; Autism Spectrum Disorder

I. INTRODUCTION

The medical community classifies Autism as a pervasive developmental disorder marked by deficiencies in social functioning and communication skills; and restrictive and stereotypical patterns of actions and behaviours [1]. In the United States; [2] defines Autism as a developmental disability that significantly affects verbal and non-verbal social interaction and communication. It is generally evident before the age of three and can affect a child's educational performance adversely. Other characteristics often linked to autism are engaging in repetitive activities and stereotypical movements; resisting change of environment or daily routines; and atypical responses in sensory experiences [2]. Autism Spectrum Disorder (ASD); along with others like attention deficit hyperactivity disorder (ADHD); Down syndrome; specific learning disabilities (e.g. dyslexia); and mild mental retardation; are classified in the category of learning disability by the [3].

In 2009; there were 100; 180 children with learning disorders; an increase from 57;483 in 2004 [4]. Malaysian education statistics presented an increase in enrolment figures of Special Educational Needs children from 48;140 in 2010; to 50;738 in 2012 to 79;836 in 2017 [3]. The majority of them (78%) are in integration programs while a smaller percentage (19%) attend the inclusive education program. 3% of the students are in special schools.

Malaysia's education minister; Dr. Maszlee Malik; recently introduced the Zero Reject Policy [5] which echoes the 1994 Salamanca Statement [6] in declaring that participation and inclusion are salient to human dignity and to the exercise and enjoyment of human rights; to which Malaysia was a signatory representative [7]. Both advocate that inclusive education be made accessible to all children. The Zero Reject Policy aims to ensure education for all undocumented and special needs children and will be implemented in stage [5]. This policy is a bold and crucial step in ensuring that the educational system caters to all students in Malaysia; particularly those with special needs. The implementation of the new act in Malaysia creates an opportunity to highlight classroom accommodations for special needs children.

Accommodations are applied in a classroom setting with the purpose of reducing the effects of a student's disability. Unlike with modifications; students' learning expectations are not lowered; reduced; or changed. Rather; support is provided in accessing the subject matter and knowledge instruction [8]. Accommodations are part of the support to ensure that a student with special needs is able to stay within his Zone of Proximal Development.

Accommodation is providing different ways of demonstrating what the student knows. Accommodation is the student learning to apply different methods or doing things differently than their atypical classmates; because of a disability; handicap; or impairment. It is the practice of changing a person's way of thinking in fitting to a new stimulus or objective [9]. Accommodation is usually classified

in four ways: response; timing and scheduling; setting; and presentation.

This paper examines classroom accommodations that can be made to address executive functioning issues of a child with ASD. The case study is of an eight-year-old named Aydil (pseudonym) who has functioning Autism and is studying at an international school in Malaysia. Methods of data collection include field observations; observation reports; and reports by professionals for three months. The researcher has been the participant's shadow aide/personal learning assistant for three years.

II. Background Information on Aydil

Aydil a Year 3 student at an Inclusive International School in Selangor; Malaysia. Aydil started at the international school when he was five years old and has received support from a personal learning assistant full-time during school hours from 8AM to 3PM. He started Applied Behaviour Analysis (ABA) therapy at the age of three; following his ASD diagnosis. His learning support gradually decreased to five hours; five days a week in Year 1. When Aydil was in Year 2; the fading-off process began with hours and days of support lessening before Aydil became fully independent (not needing external support services) towards the middle of the school year. A guideline was prepared and distributed to teachers involved in Aydil's learning. Aydil was able to function quite well without any challenges that would need external support. However; in Year 3; the school requested that Aydil have external support. This was due to the more challenging environment; which include moving on to topics that would require more complex and abstract thinking; as well as the fact that an assistant teacher would no longer be present in the classroom as they had been in early years to Year 2. Aydil's parents agreed to provide the services of a personal learning assistant (PLA) twice a week for four to five hours a session.

III. Construction of Research Instruments

Methods of data collection include field observations; observation reports (Appendices 1.01-1.12); interview (Appendices 3.1-3.2); and reports by professionals (Appendices 2.1-2.2) over the course of 12 weeks. Observation reports (from the researcher as Aydil's Personal Learning Assistant); feedback from teachers (Appendices 4.1-4.3); reports from professionals (Appendices 2.1-2.2); and transcripts of the interview with Aydil's mother; Madam Mona (Appendix 3.1) and the school Special Educational Needs coordinator (SENCO) (Appendix 3.2); were used to gather information on Aydil's strengths and challenges in the classroom. This analysis of Aydil's executive functioning challenges was examined to identify and suggest accommodations that could be made for him in the classroom. [8] and [10] were referred to in identifying and examining appropriate accommodations to support Aydil.

IV. Aydil's Strengths and Challenges

A. Aydil's Strengths

Aydil has no problems responding to instructions. He has better attention and focus in a 1:1 setting. Aydil is able to make references when he is reading a story based on a picture given to him (Appendix 2.2). He responds well to simple instructions given directly to him. He is generally quite compliant in school and has no major behavioural issues in the classroom (Appendices 4.1; 4.2; 4.3). He is able to generally adhere to the rules and regulations in school. He is able to acknowledge and express his frustration in doing something; for example; "I can't do this;" or "This is too difficult." (Appendix 1.4) He is able to ask for help when he needs it (Appendices 2.2; 4.2). He is generally able to function quite well in the school setting and can navigate his way around school. He has a good memory for things that he is interested in; like the names of trains in the Thomas series (Appendix 3.3).

B. Aydil's Challenges

Aydil faces some challenges in thriving in an inclusive classroom which revolve around his executive functioning skills. (Details in Appendices 1.01-1.12; 2.2; 3.1; 3.2; 4.1-4.3)

1) Attention Shifting

He usually starts to 'space out' towards the middle of a task. This could possibly be due to the lack of ability to shift his attention or mental sets; in going from one part of the task to another; or one question to another.

2) Inhibition

Aydil's inhibitory control is generally well-maintained in the school setting. His teachers have not reported any behavioural issues. He is generally compliant with classroom rules and the teachers' expectations of him.

Aydil sometimes experiences some inhibitory challenges as exhibited in some of his behaviours like playing with his stationery and school tag or fidgeting during instruction and task time. He is unable to control or inhibit his responses towards the prepotent stimuli; in this case his tag and stationery; which might result in him being off-task and unable to complete his task within the given time frame. Fidgeting might be a manifestation of his anxiety as he tends to fidget when he is feeling confused or is lagging in the classroom. He also tends to fidget when he is excited.

3) Working Memory

Working memory has been quite a huge challenge for Aydil and has affected his skills; particularly in mathematics and English reading and writing. He faces difficulty in understanding complex and abstract concepts as well as in processing and manipulating information mentally (e.g. mental addition and subtraction).

Too much auditory presentation of instruction causes him to lose interest. He is more engaged and captivated by visual presentations; like videos and pictures. It is also harder for him to hold information when it is presented auditorily. Moreover; too much wording in instructions or presentation of concepts and information also causes him to lose focus and face difficulties in understanding the instructions or concepts.

Aydil faces challenges in remembering; processing; and responding to complex multi-step instructions and information. When he is asked to repeat the instructions or the information that had been explained; he is sometimes not able to do so. Retrieving information from his working memory and applying concepts and information gained from the instructional process to the completion of tasks is challenging for him.

Aydil usually requires prompting to stay on task. His class teacher was worried that Aydil might not be able to receive and respond to her instruction well but said that even though he looked like he was not listening; he could sometimes repeat the information given (Appendix 4.1). Aydil has the tendency to zone out when the lesson is challenging and when his interest and motivation in the topic is low or the instruction process is too long.

The lack of ability in maintaining his attention would usually lead to Aydil not being able to understand what is required of him in completing a task or missing out conceptual information required in a task.

4) Planning

A possible reason for Aydil's 'spacing out' could be due to deficits in his planning skills. He finds it difficult to generate ideas and start his task. While he is doing his task; it is a challenge for him to keep his focus on the task; as he tends to freeze or space out; usually when he faces an obstacle in completing the task. He is usually able to identify the sequential order of the task but finds it difficult to follow through the execution of process. He also faces difficulty in identifying a selection of alternative options when he faces a problem.

Aydil faces challenges in completing English writing tasks due to deficits in his planning skills and inability to execute plans. He responds better to tasks and the process of planning when it is visually presented to him and needs support in the planning of a writing task. Aydil also faces challenges in the initial stage of the task. He finds it difficult to start his task or to generate ideas needed to complete his task and usually 'spaces out'.

V. ACCOMMODATION

(Details in Appendices 1.1 - 1.12; 2.1; 2.2; 3.1; 3.2; 4.1-4.3)

1) Attention Shifting

Aydil needs instructional; time; and setting accommodations to address his attention shifting difficulties. Periodic checks on his progress would be needed to ensure that he is on task. This would be made more convenient by placing him closer to the teacher. Breaks between tasks are suggested to create the opportunity for him to regulate himself in order to shift his attention to another task.

2) Inhibition

Setting accommodations are suggested to address Aydil's inhibition challenges. Fidgeting could possibly be a manifestation of Aydil's anxiety; therefore providing breaks would be effective to address his inhibitory control. Aydil can be given choices of ways that he can regulate himself like drinking water or doing some deep breathing exercises. Aydil could also be allowed more opportunities to move when he gets restless.

Predictable routines are needed to decrease the chances of him being anxious and fidgeting. If there is a change in the routine; he can be informed to allow him to regulate himself and refrain from impulsive reactions. Visuals of routines and procedures can be displayed in the classroom so that he is able to refer to it when he needs to. Visuals can also be used as reminders for him to be aware and to not engage in undesirable actions like playing with his tag or stationery that could diminish his focus in completing a task.

3) Working Memory

Presentational and instructional accommodations are suggested to address Aydil's challenges in working memory. As Aydil finds it difficult to process multi-step instructions and complex information; these could be broken down for him. The teachers could use simpler words and present the information visually. Graphic organisers might aid him in processing the information better. For example; in a writing task; the PLA probed Aydil to list words that were associated with the topic in the form of a mind map. This enables Aydil to link the information in order to apply it in a task. Furthermore; as Aydil responds more to visual stimuli and finds it more challenging to store and process information presented auditorily; visual support and stimuli is needed in presenting information to him during the instruction process.

In order to gauge if Aydil has been focusing during instruction; the teacher can instruct him to repeat the information or procedures in a task. Making eye contact with Aydil or checking if he is listening would encourage him to pay attention to the instruction. Periodic checks are needed to ensure he that maintains his attention on his task. Smaller group settings when presenting information would be helpful as Aydil responds better in smaller group settings.

4) Planning

Lack of planning abilities can be addressed by utilizing all four types of accommodation. In order to aid Aydil in the planning or execution of steps in his task; the plan needs to be visually available to Aydil to refer so that he is clear of the task demands and the procedures in the task. Visual checklists

would make him more aware of the procedures in the task and he would be able to monitor his own progress on the task. Providing him with an opportunity to draw out his responses is a response accommodation that can be made to support Aydil in generating his responses. It is hoped that with the opportunity to illustrate his ideas first; it would help him in conceiving more ideas in his response.

VI. DISCUSSION

It is salient to consider executive functioning challenges in order to select appropriate accommodations for a child with learning disabilities. Research has suggested that executive functioning challenges are prevalent in children with ASD. Executive functioning has been increasingly receiving attention as executive functioning deficits have been consistently demonstrated in ASD samples [11]. Highly structured and explicit task demands and individualized education plans that build on students' successes in their learning environments might help children with ASD to learn new executive functioning related skills in order to apply them in increasingly complex settings.

A number of studies with national representative samples and longitudinal studies have suggested from their findings that early development of executive functioning skills predicts growth in academic performance over time [12], [13] although certain studies showed no significant causal association between the two [14]. Some researchers have recently advocated to increase opportunities in assessing students' executive functions; in order for schools to add the information to student profiles to have a better understanding of their social-emotional status and academic needs. This would lead to the provision of appropriate interventions when necessary [15]; and support in the form of curriculum modification and classroom accommodations.

Since executive functioning skills affect various types of information processing at different levels [16]; other cognitive abilities would be compromised [17] when there are deficits in executive functioning skills. The impacts of executive functioning skills are salient for learning and academic achievement. In the academic environment; challenges in mental processes that have a direct or indirect dependence on executive functioning skills can negatively affect academic performance in school [18], [19]. In an academic setting; although separate from a student's knowledge of a subject; executive functioning challenges can affect achievement in that subject significantly through the impact of the skills on multiple steps of processing; organization; and retrieval of information. For example; students who lack ability in concentration; inhibition of distractions; and attentional focus will have the tendency to face challenges in processing new information; while listening to the teacher during instruction [17].

[17] assert that in solving a problem or achieving a goal; some children who lack executive functioning skills might have an understanding of what is to be done or required of them but face difficulties in the organization; mental manipulation of relevant thoughts and information and integrating the information in solving a problem. This notion is in line with the finding that children with executive skill challenges would still have difficulty despite knowing the mathematical facts or understanding mathematical concepts [20]–[22]. Challenges in executive functioning skills might impact on the ability of a child to produce alternative solutions or cause the child to be stuck on applying one method to solve a problem [17]. Furthermore; since executive functioning dysfunctions are not visible readily [23]; they might go unnoticed; decreasing the opportunity of remediation and can possibly cause increasing frustration on the affected child [17]. Thus; it is important to consider accommodations in order to provide support with the purpose of filling the educational cognitive functioning gaps that would affect a child's learning and academic performance.

According to [24]; there are some considerations to be made in the identification and selection of accommodations. The first consideration is to identify tasks or elements of learning that are challenging for the child. Thus; the identification and selection of the accommodation process usually begins with the identification of the child's strengths and challenges in a classroom setting [10]. In this study; it has been done through analysing observation reports by the PLA; feedback from the teachers; reports by professionals; and an interview with the parents.

Another important consideration is to ensure that the difficulties are included in the student's individualized education plan [10]. Aydil's school has requested an educational assessment to be conducted in order to prepare and implement and inclusive education plan. At the time of writing; Aydil was still waiting for an educational assessment appointment from a certified educational psychologist. However; since the preparation and the implementation of an individualized education plan involves documenting strengths; challenges; curriculum modification and accommodations [25]; the accommodations in this study would be proposed and reviewed before being included in the plan.

The next consideration is to examine the reasons or causes in these challenges [10]; Aydil was found to have challenges in terms of his attentional regulation skills. Those challenges are then broken down into different elements of executive skills which provides explanations for the reasons behind his struggle in maintaining his focus and attention in instruction and doing tasks. Spacing out or zoning out during instruction and task time has always been an issue for Aydil. Through the analysis of the different elements in executive functioning; it was found that his behaviour of spacing out especially during tasks is impacted by deficiencies in working memory; cognitive flexibility; and planning. The elements of working memory; inhibition; planning and cognitive flexibility have an impact on his challenges in completing tasks on time; understanding and processing complex and abstract instruction and concepts; and difficulty in maintaining attention and focus on instruction by the teacher and in doing his tasks.

Next; the team involved in the students' learning like the administrators; teachers; professionals (e.g. psychologists) and learning support staff proceed with the identification of appropriate accommodations to enable students in accessing information and demonstrating performance of the task. The team can list a range of accommodations and should not confined to utilizing a single device or strategy [10]. In the study; observation reports by the PLA; teachers' feedback; professionals' reports and an interview with the parents are analysed to identify accommodations used by the teacher and suggest accommodations to address the students' challenges in learning. Accommodations are identified and adapted from the [8] and the [10]. In the consideration of multiple options; the most effective ones can be selected. The team should ensure that the accommodations selected match students' needs and abilities [10].

There are four types of accommodations highlighted in this study; presentation; time and scheduling; response; and instructional accommodations. Aydil requires all four accommodations in order to address his executive functioning challenges in the learning process. These accommodations aid in improving the quality of Aydil's access to the curriculum. Presentation accommodations that are utilized ensure that complex information and concepts are broken down into smaller parts and presented in a more visual way as suited to his needs. Timing and scheduling accommodations; like giving Aydil breaks; are utilized so that Aydil is able to regulate himself; mostly in shifting his attention and transitioning between activities. Instructional accommodations usually involve periodic checks by the teacher to ensure that his attention is maintained and checking that he is able to understand the instruction before responding.

VII. CONCLUSION

Although there are challenges for Aydil to thrive in the inclusive environment; with supportive teachers who are willing to implement accommodations to suit Aydil's learning needs and collaboration between individuals involved in Aydil's learning environment; success becomes a bigger possibility for him. The right amount of support given to him would ensure that there is ample opportunity for him to succeed. When Aydil's needs are met; and his learning is scaffold appropriately; it gives Aydil a fair chance of achieving success alongside his typically developing peers.

From a larger perspective; it is very important for an inclusive community to be fostered in the school system so that the implementation of accommodations in the classroom does not solely fall on the teachers. Students with learning disabilities can achieve success or even perform better than their typically developing peers if their needs are considered and the right amount of support in the form of classroom accommodations are made to cater to those needs.

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