

Task Performance Analysis for Students with Autism Spectrum Disorder (ASD) in an Inclusive Classroom: Its Effects on Students' Behavior and Communicative Development

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Abstract. Task performance analysis (TPA) is essential to providing step-by-step guidance to students with ASD as they learn to communicate and be independent. However, based on observations, few schools employ them to teach students with ASD in Buleleng Bali. The purpose of this study is to adopt TPA for students with ASD and see how it affects their behavior and communication abilities. The study used a single-subject design and was carried out at a bilingual, inclusive school in Buleleng. Three students with ASD were given TPA to modify certain behaviors. Data were collected for six months through observation, interview and document analysis, and testing was conducted at the end of the implementation. Data were analysed using both descriptive quantitative and qualitative approaches. As evidenced by the results, the students' behavior improved regarding to toileting training, eating lunch, clearing tables, and opening shoes behaviors. Even when they do not always follow social norms, they also understand basic communications, such as greetings and teachers' instructions. The results of the study suggested that the implementation of TPA led to improvements in their social conduct and communication.

Keywords: Task Performance Analysis , Autism Spectrum Disorder, Inclusive Classroom

1 Introduction

1.1 A Subsection Sample

There are several ways that researchers carried out to help students with ASD learn better, and one of them is visual support [1], [2], [3], [4], [5]. One of the visual supports is Task Performance Analysis (TPA). TPA is explained as a task that is used to break down complex tasks into a series of smaller or simpler steps or actions. For some individuals on the autism spectrum, even simple tasks can present complex challenges. By breaking down information or instructions into simpler steps, the instructions or information will be more easily understood by students on the autism spectrum. TPAs

are developed using one of four methods. First, competent individuals with demonstrated expertise can be observed, and their steps can be documented. The second method is to consult with experts or professional organizations that have expertise in validating the required task steps. The third method involves teaching them the skills to perform the task themselves and documenting the steps. The final approach is trial and error, where an initial task analysis is generated and then refined through field testing [6], [7]. The National Professional Development Centre for Autism Spectrum Disorders defines TPA as a teaching process that breaks down complex activities into a series of simple steps that students can learn more easily. Researchers have shown that TPA meets the criteria for evidence-based practice by increasing the application of “appropriate behavior and communication skills” by children in preschool, elementary school, and middle school (<https://online.regiscollege.edu/blog/task-analysis/>).

TPA is needed in teaching students with ASD because they have limitations in social interaction with other people. A study has been conducted on developing TPA as media for teaching children with special needs in inclusive classes [8]. Several TPAs were developed that are needed to change the behavior of students with ASD in carrying out daily activities.

Children with ASD are children who experience disturbances in communication and social interaction skills, are repetitive and show typical behavioral patterns that make it difficult to accept changes in the environment or changes in daily routines, and respond inappropriately to sensory experiences (American Psychiatric Association, 2013). ASD children also show characteristics that indicate difficulty communicating with other people and have basic literacy skills that are far below their age [9], [10], and do not perform as well in school as one would expect based on their scores on norm-referenced assessments [11], [12].

In connection with the limitations that students with ASD have, they need to be assisted with various media that enable them to improve their ability to communicate socially, and one of the media that needs to be used is task performance analysis [13]. By using TPA, breaking down activities into several simpler activities includes various actions or behaviors in which students with special needs participate to complete certain tasks or achieve certain goals. These activities involve the application of cognitive, physical, or social abilities to accomplish a goal.

Students with ASD often have different learning styles, abilities, and challenges that may impact the need for adjustments to the learning provided in the form of certain assignments. Providing them with task execution activities that suit their needs can provide a variety of benefits. To support their learning and development in a way that is tailored to their unique needs and challenges, creating TPA is appropriate that can be broken down into several steps to help teaching autistic children doing tasks in a structured manner. The goal of TPA is to help students with ASD learn basic skills that will enable them to live independent lives. TPA is one of several methods used by experts to make it easier for them to understand information and change their behavior [13].

The main use of TPA is to teach daily life activities (ADL). ADLs are actions that most people perform every day, such as setting the table for dinner or buying an item and asking for change. However, for people with autism spectrum disorders, these skills are not easy, though very important, because this type of activity serves as the basis for their independence [14]. Individuals with autism spectrum disorders gain a better

understanding of basic life skills by focusing on mastering more advanced steps in a complex process. Task analysis can be applied to any process that can be broken down into several steps. Once the steps are identified and directions are given, the teacher prepares a learning plan tailored to the needs and the goal of students to be more independent in inclusive schools.

The application of TPA in a bilingual setting and its use for ASD students in an inclusive school constitute the research's novelty. The nature of TPA itself is another aspect of its originality.

Realizing the importance of TPA for students with ASD, the present study aimed at implementing TPA for teaching students with ASD and analysing its effects on the students' behavior and communication skills. This study's novelty and originality stem from the application of TPA for students with ASD in an inclusive and bilingual context. The problem formulations for this research are:

- How does the ability of students with ASD develop to perform basic communications after TPA is implemented?
- Does the implementation of task performance analysis have an impact on the behavioral modification and basic communication of students with ASD studying at school?

2 Method

This research used a single-subject design. It is a design applied when the sample size is one or when an equal number of individuals are considered a group. This design is used because TPA is implemented for students with ASD whose characteristics cannot be compared with those of other ASD students. The type of design used is ABA design. This design consists of 3 phases, namely: 1) baseline phase: first measurements are taken of the child's behavior and abilities during initial student communication (A1); 2) intervention is carried out (applying TPA) and measurements are carried out during intervention (B); and 3) taking measurements against the baseline (A2). The additional baseline (A2) was used as a control in the intervention phase for conclusions about the impact of TPA on student behavior and their abilities to carry out basic communication. The subjects of this research were all ASD students who studied at regular elementary schools that apply the policy of inclusive education in North Bali. The subject selection for the research was carried out using a purposive sampling technique with the following criteria: 1) students studied in an inclusive school; 2) students are in the category of students with ASD; and 3) they get English lessons. With such criteria, the total number of students with ASD identified was three. The ASD severity of the three students was diagnosed as level 1: requiring support. They struggle to understand social cues and have trouble forming and maintaining personal relationships. They speak in complete words or sentences, but they struggle to hold back-and-forth conversations (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition).

Several instruments are required for its application, including: 1. TPA; 2. the individual education plan; 2. an evaluation guide for carrying out the task performance assessment; 4. An observation sheet to document the findings of qualitative

observations. The steps of data collection can be described as follows: 1) Observe ASD students and collect data; 2) Implement the TPA for every student with ASD; 3) Collect data after implementation and analyse changes, and 4) Compare the baseline data and the data after implementation to see the effectiveness of TPA implementation. The steps of implementation can be summarized as follows.

Table 1. The Steps of TPA Implementation

No	The Step of teaching	Description
1	Identifying the teaching goal	In this step, the teacher determines the goals to be achieved. These goals should be specific and measurable. These goals can include academic and social matters, as well as daily living skills that the students want to develop. At this stage, the teacher creates a skill mapping for each autistic child being taught.
2	Mapping skills of the students	The teacher identifies what students with ASD have mastered, what needs to be improved, what should be taught from the beginning. The teacher chooses tasks/activities that are appropriate and needed by students, by the goals that have been stated, and that they want to develop.
3	Selecting the learning activity	The tasks to be done by students are broken down into smaller, simpler activities and must have clear steps.
4	Analyzing the student's activities	The teacher carries out an in-depth analysis of the tasks/activities performed by students with ASD. The teacher identified activity components such as activity steps that students must carry out, instructions used, tools

		and learning materials used and indicators of achievement.
		The teacher needs to adjust the tasks/activities taught to students according to their needs.
5	Adapting and modifying tasks	This involved simplifying instructions, preparing visual media to support learning, and adjusting activities according to students' needs and interests.
6	Conducting the process of teaching	The teacher implemented the steps provided in TPA, step-by-step, following the student's needs. In providing feedback to students with ASD, the feedback given must be clear and motivating.
7	Providing feedback	Teachers need to provide positive reinforcement for the progress that has been made, and provide constructive direction to improve students' understanding and behavior.
8	Monitoring progress	Assessment of the progress made by each student with ASD is always carried out regularly. A review needs to be carried out to see whether the learning objectives are met and identify matters that need further attention.
9	Collaborating with support system (parents/therapist)	Involve a support team such as a team of teachers/assistants, therapists in the student learning process in regular classes. Discuss learning strategies that are

considered effective and discuss student progress.

There are 6 pictures of TPA were implemented. Before the steps were executed, the TPA media were stucked on the wall close to the actions needed. For example, TPA picture about toilette training is placed in the toilet room. The TPA about putting on shoes is placed on the wall near the entrance door where the students must take off and put on their shoes.

Table 2. Topics of TPA implementation

No	Topics	Breakdown steps	Purpose
1	Expressing Good Morning	4 smaller steps	To teach students able to greet and express 'good morning
2	Expressing Good Bye	4 smaller steps	To make students able and understand the use of Good Bye
3	Opening shoes behavior	5 smaller steps	To teach students the instruction and able to open shoes independently.
4	Cleaning table behavior	7 smaller steps	To teach the students the instruction and able to clean the table.
5	Having lunch behavior	8 smaller steps	To teach the students the instruction and able to have lunch independently.
6	Toilette training behavior	6 smaller steps	To teach the students the steps of using toilette and understand the instruction

The example of 6 media of TPA implemented and stucked on the wall can be seen in Picture 1. The TPAs were implemented by the teachers in teaching about simple communication and behavior modification.

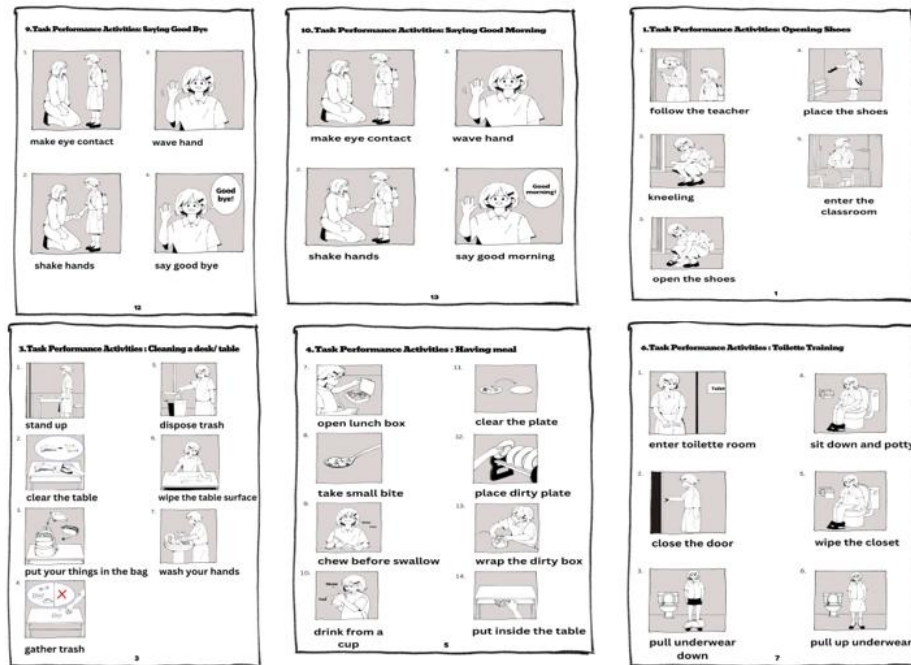


Fig. 1. The examples of TPA media.

The data were collected for six months. The collected data were analyzed qualitatively and quantitatively. Data about changes in behavior and students' basic communication skills were analyzed qualitatively. The data was also analyzed quantitatively.

The TPA has instructions in English, and students are exposed to them in a bilingual atmosphere. The pupils' native language is Bahasa Indonesia, and English is utilized as a language of instruction in English class, with some challenging concepts taught in Bahasa Indonesia.

In order to gauge the improvement of the students' behavior and communication skills, the collected data were examined both qualitatively and quantitatively using descriptive quantitative analysis.

3 Findings

3.1 The ability of students with ASD to perform basic communications after TPA is implemented

Table 3. The development of students with ASD on communication skills

No	Student /Case	Communication Skills before TPA is applied	Ability to communicate after TPA is implemented
1	DV	It is challenging for DV to work with; directions must be repeated in order to be understood, and he frequently needs to be led by hand when performing tasks. He frequently tantrums when things don't go his way.	In addition to understanding the instructions through TPA, he is able to communicate verbally but maintains hyperactivity, and his interactions are frequently haphazard. DV makes good progress in reading instructions In English, but he still struggles to comprehend what he is reading.
2	SN	Orders had to be said repeatedly, and he often did not know how to do his duty.	One-on-one communication goes well; being able to read well and answer questions (if in Indonesian), but if in the English language, he still communicates in basic words only. SN can only read a few words. He, too, was unable to comprehend what he read.
3	AG	He often does not understand the tasks that must be done and are very hyperactive.	He can interact despite still being very hyperactive; conversations are often random and disconnected. AG exhibits verbal development and converses incoherently in Indonesian, but they lack social awareness.

Table 3 reveals that the students have improvement after the TPA were implemented. Despite having progress, not all of them were developing in an equal progress. The development for each student is displayed in the following figures (figure 1,2 and 3).

3.2 The development of students' behavior after TPA is implemented

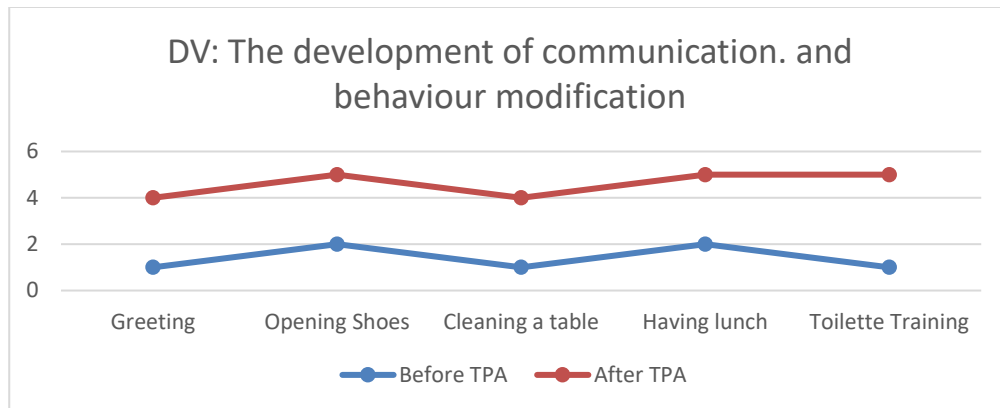


Fig. 2. The Development of DV in his Behavior after TPA Implementation

Remark:

- 5: can do the activity correctly and independently
- 4: can do it correctly but with stimulation
- 3: can do it but more frequently cannot do it correctly independently
- 2: can do it with examples and physical guidance
- 1: cannot do it and is not willing to do it

Figure 2 shows that DV was progressing in the communication skills like able to express greeting and understand verbal instructions for changing behavior. His behaviors were improving like when opening shoes, cleaning a table, having lunch and toilette training.

Table 4. The development of Students, DV, on communication skills

TPA	The skill before TPA implemented	The skills after TPA implemented
Expressing Good Morning and Good Bye	Cannot independently response "good morning" and "Good Bye" to people/teachers	Able to say greeting 'good morning or good bye' but must be given stimulation.
Opening shoes behavior	Do not response to instruction when the teacher said "Open your shoes here".	Able to open shoes properly.
Cleaning desk/table	Do not response to instruction when the teacher said "please clean your desk now" Cannot do it at all.	Understand the instruction and spontaneously do it. He can do it but with stimulation.

Having lunch behavior	Do not response to instruction when the teacher said "Open your lunch box". He did not response and did not do it independently	Understand the instruction and spontaneously do it. He can do it by himself
Toilet training	Was not willing to go back to his classroom when the teacher invited him verbally to leave the toilette room and return to the classroom.	Understand the instruction well, as he suddenly leaves the room when the teacher invited him verbally to go back to his class, He can do it by himself

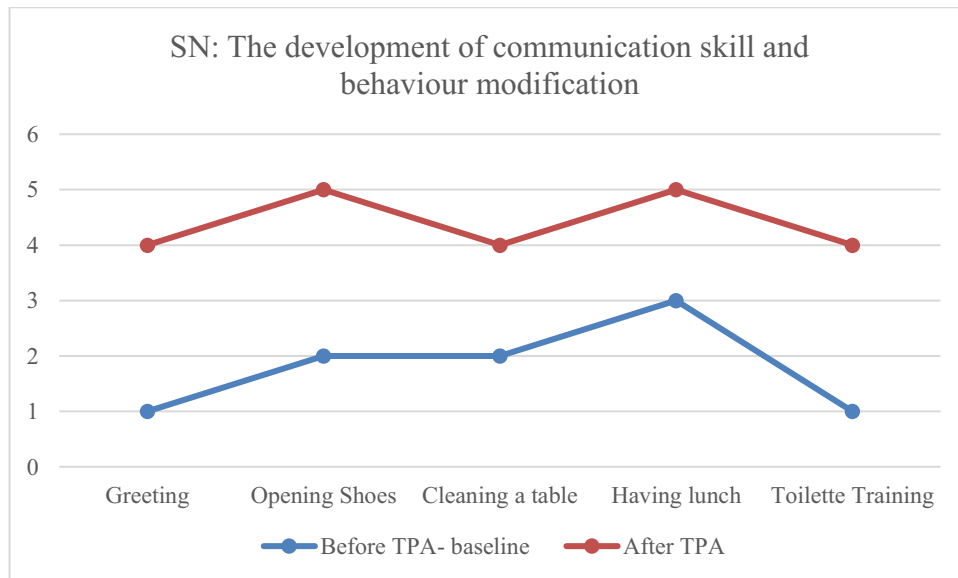


Fig. 3. The development of SN in his behavior after TPA implementation

Remark:

- 5: can do the activity correctly and independently
- 4: can do it correctly but with stimulation
- 3: can do it but more frequently cannot do it correctly independently
- 2: can do it with examples and physical guidance
- 1: cannot do it and is not willing to do it

Figure 3 reveals that SN also shows some improvements in communication and also behavior modification such as to express greeting, opening shoes, cleaning a table, having lunch and toilette training.

Table 5. The development of student, SN, on communication skills

TPA	The skill before TPA implemented	The skills after TPA implemented
Expressing Good Morning and Good Bye	Cannot response independently “good morning” and “Good Bye” to people/teachers	He can say greeting ‘good morning or good bye’ but not consistent, sometimes need 1 x stimulation.
Opening shoes behavior	Low awareness about opening shoes before entering classroom and cannot do it independently, even though the teacher asks him verbally.	He understands the teacher’s instruction and able to do it independently without any stimulation
Cleaning desk/table	Cannot response when the teacher asked him verbally to clean his table. He cannot do it at all.	He understands the teacher’s instruction and able to do it but with stimulation.
Having lunch behavior	Cannot response when the teacher asked him verbally. He cannot do it and not willing to do it	He understands the teacher’s instruction and can do it independently
Toilet training	Was not willing to go back to his classroom, he likes to play in the toileted instead.	He understands teacher’s instruction and willingly go back to the classroom as soon as the teacher instructed him to go back.

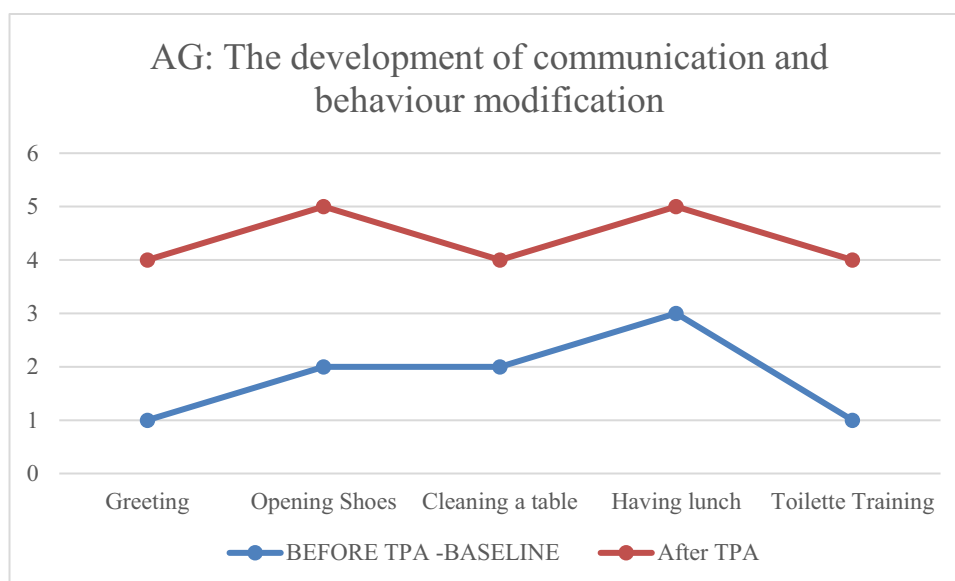


Fig. 4. The development of AG in his behavior after TPA implementation

Remark:

5: can do the activity correctly and independently

4: can do it correctly but with stimulation

3: can do it but more frequently cannot do it correctly independently

2: can do it with examples and physical guidance

1: cannot do it and is not willing to do it

Figure 4 shows that AG also shows improvements in his communication skills and behavior. His improvement is obvious in greeting, opening shoes, having lunch and toilette training.

Table 6. The development of students, AG, on communication skills

TPA	The skill before TPA implemented	The skills after TPA implemented
Expressing Good Morning and Good Bye	Expressing Morning and Bye	Good Cannot response independently "good morning" and "Good Bye" to people/teachers
Opening shoes behavior	Opening behavior	shoes Low awareness about opening shoes before entering classroom and cannot do it independently
Cleaning desk/table	Cannot do it at all	Can do it but with stimulation.
Having lunch behavior	Cannot do it and not willing to do it	Can do it independently
Toilet training	Cannot do it himself	Need to be accompanied and guided by the teacher

The information above demonstrates that there have been behavioral changes and enhancements to students' communication abilities to all 3 students. Students' performance before and after the TPA implementation differs noticeably from one another, and this improvement is seen in nearly every one of the five tasks that are taught.

4 DISCUSSION

The use of TPA in the form of visual supports for teaching students with ASD indicates obvious improvement. The data analysis results show that, despite the students' requirement for stimulation, the use of TPA clearly improves their ability to greet and say "good morning" and "good bye." The implementation of TPA obviously helps students with ASD understand the tasks step-by-step, each of which is provided with simple instruction. The use of pictures for each step is very essential for students with ASD. This is in line with their characteristics that students with ASD indicate difficulty communicating with other people and have basic literacy skills that are far below their age [10], [15], [16], [17], [18]. In connection with the limitations that students with ASD have, the use of TPA enables them to understand the tasks that are presented in smaller steps. The power of TPA exists in the nature of the broken-down, smaller steps provided with pictures, which make them practice each task step-by-step and do it with understanding. These activities involve the application of cognitive, physical, or social abilities.

This study has six TPAs, all of which relate to tasks for daily activities. This is meant to help the students with ASD become more self-sufficient in their daily lives. TPA's objective is to educate about the activities of daily living (ADL). ADLs provided in this study are tasks that most people take on a regular basis in order to live their lives, such as setting the table for lunch, opening shoes before entering the classroom, or toileting training. People with autism spectrum disorders, on the other hand, have difficulty performing these tasks. As a result, these activities are crucial because they lay the groundwork for their independence. The improvement that resulted in this study is in line with the study conducted by Patricio da Silva [15], which also applied ABA design in their study.

The use of TPAs in an inclusive teaching and learning environment enhances their effectiveness. There are three key concepts underpin effective inclusion [19]. First, supporting every student in the classroom in a "natural and non-disruptive" manner is the aim of effective inclusion. Second, evidence suggests that educators will persist in integrating supports that mesh well with regular classroom activities, are thought to be beneficial by them for every student, and broaden their toolkit of instructional strategies. Third, modifying classroom practices is crucial to building an effective, inclusive atmosphere that allows students with ASD to learn in a nurturing setting.

The findings of this study's data analysis demonstrate that using TPA to modify behavior and practice greetings in an inclusive setting is clearly successful because it is used in classroom settings where students with ASD and regular students are mixed. The ordinary students serve as role models for the TPA practices in a natural context,

and the students with ASD get real knowledge from their peers. Even though they may not understand the meaning of the words they are constantly exposed to, students learning in a bilingual environment demonstrate improvements in their ability to verbalize sentences and sometimes engage in social contact. This is consistent with earlier research that suggests, despite frequently exhibiting common autistic traits like pragmatic challenges that hinder communication, multilingual autistic children may benefit from multilingualism in ways similar to those of their multilingual peers who are not autistic [20]. The use of TPA in inclusive classrooms allows students to practice living with classmates in a natural context while also exposing them to English in a bilingual setting, both of which benefit the students. This means that managing a varied student body with a range of talents and capabilities requires commitment and skilful classroom management. Teachers need to proactively prepare the classroom and adopt educational strategies that benefit every student in light of the increasingly diverse classrooms of today [10], [21], [22]. Despite the progress this study made, it is crucial to remember that it only looked at the implementation of six TPAs for five topics of daily activities; therefore, more research with a larger sample size and data collection periods longer than six months will be needed in the future.

5 CONCLUSION

The implementation of TPA for students with autism spectrum disorder in an inclusive classroom has beneficial effects on students' behavior and their communicative development. The three students with ASD involved in this research can improve their communication skills. The TPA, which uses English as the medium of instruction, provides obvious influences on the improvement of the students' basic communication skills in English. The TPA implementation also has an impact on their behavioral modification at school. The pictures provided in the TPA provide visual guidance on how they modify behavior. It is implied that the use of TPA is successful in improving the students' behavior and also their ability to use basic skills in their daily conversation. Despite its effectiveness, it is recommended to carry out similar research with more students with ASD as future consideration.

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