Effective Learning for Students with Autism:  
A Literature Review

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Abstract
The learning process requires the development of methods and media to support learning and increase students’ understanding and enthusiasm during the learning process. This literature review aims to identify effective learning methods for students with autism. The current research procedures consisted of article selection, analysis, and categorization. The present study is essential to determine the development of effective learning methods for students with autism; such as Discrete Trial Training, pivotal response training and script training, Augmentative and Alternative Communication. In the end, this study concluded the presence of learning methods and media development for autistic students to increase interest and understanding during learning.

Keywords: Autism, Student, Disability, Effective Learning

1. Introduction
The United Nations is a global institution created to promote equal international cooperation and uphold world peace. In 2015, the UN declared an international agenda entitled Sustainable Development Goal (SDG), which aims to reduce poverty, protect the planet of earth, while also realizing peace and prosperity for the entire human being. SDG contains 17 points contemplating sustainable social, economic, and environmental equality, with 169 achievement indicators that should be achieved by 2030.

Quality Education is the fourth point of SDG. Linearly, every nation desire excellent education quality in their country. In Indonesia, the government has attempted to enhance its education quality through the enactment of Law 20/2003 on National Education System. In article 5, paragraphs 1 and 2 of Law No. 20, the Year 2003, it is mentioned that all Indonesian citizens have the equal right to attain education, with no exception to those with physical, emotional, mental, intellectual, and social barriers.

Based on the types of services being provided, the educational system offered to students with disability is divided into three types, namely segregation, integration, and inclusion. Segregation education is an educational system that dissociates the education for regular students and students with special needs. Integrity education provides a comprehensive education with means of unification, partially or wholly unification following the situation. Meanwhile, inclusive education provides educational services that consolidate students with disabilities and regular students in a single place (Latifah,
Consequently, students with special needs have the preference to attend segregated, integrated, or inclusive education. As students with special needs have hindrances, they need special education. For these students, the education service should concern not only with their academic capacities but also their mental, social, emotional, and physical progression, along with their ability to help and take care of themselves.

Students with autism are also categorized as students with special needs. Ningrum, Wuryani, and Lianty (2021) define students with autism as those who encounter developmental disabilities in the aspect of communication, perception, behavior, and social. According to Nugraheni dan Sudarto (2021), the effects of autism on students revolve around disruptions in communication and social interactions. The social interaction hindrances obstruct students from aspiring their wants or opinion and comprehending the interaction during the learning processes. Therefore, the development of a particular learning method effective for students with autism is required to enhance their academic and non-academic development. The students with autism spectrum (mild to moderate) can learn science by textbooks, e-text, or computer programs.

Some studies have shown about effective learning to students with autism spectrum. A deeper literature review is needed to summarize the information of prevailing studies comprehensively. The current literature review summarized about effective learning for students with autism spectrum.

2. Method

This study used a systematic literature review method in gathering several most recent and relevant literature. Our research procedures consisted of article selection, analysis, and categorization. From the process of article selection, we obtained nine relevant literatures selected based on their relevance to effective learning for students with autism.

2.1 Selection of Research Articles

For the articles, we selected relevant research articles from the “eric.ed.gov” site. Before inputting the keywords, we filtered the articles. We only involved the peer-reviewed articles available in full text that were published between 2017 to 2021. Using the keywords of ‘effective autism learning,’ we attained 14 research articles. After further analysis, we gathered nine articles investigating effective learning for students with autism.

2.2 Data Analysis

This study analyzed nine research articles relevant to our research topic. The analysis was carried out by one of the researchers, while another researcher verified every research article. In the analysis and verification process, we used the same criteria mentioned beforehand.
2.3 Categorization of Research Articles

Each research article was reviewed from the statement of problems to all of the interpreted data. Besides, we also ensured that every research paper gathered in this study presented more than one finding, such as different attainments. Therefore, the garnered research articles were analyzed based on the effective learning results for students with autism.

3. Results

Nine studies examining effective learning for students with autism were reviewed in this study. The results indicate a number of effective learning methodologies for students with autism.

Among those identified learning methods, the training method is proposed as an effective learning approach, as reported in a study investigating Discrete Trial Training (DDT) carried out by Flora, Rach, and Brown (2020). The same result was also observed in a study exploring pivotal response training and script training conducted by Cardinal (2021). Another effective learning method for students with autism is the peer tutor method reported in a study by Biggs et al. (2018). That study examines the peer tutoring method using Augmentative and Alternative Communication (AAC).

Aside from those methods, other learning techniques are also confirmed to be efficient for students with autism, such as learning that uses excellent learning media (Simon and Hines, 2017), video modeling (Cardinal, 2021), VSD (Visual Scene Display) video (Babb et al., 2019), smart board media (Cattik and Odluyurt, 2017), an adaptation of employee handbook (Devine et al., 2018), the potty patty media (Flora, Rach, and Brown, 2020), map concept media (Jackson and Hanlin, 2020), and using figure notes (Lee, Ho, and Bhargavi, 2022).
<table>
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<th>Authors</th>
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<th>Learning Method or Media</th>
<th>Results</th>
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<tr>
<td>Simon and Hines (2017)</td>
<td>2</td>
<td>Video modeling media demonstrate a particular activity, ability, or task.</td>
<td>This technique potentially aids those students with autism who plan to go to university, improving their public speaking.</td>
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<tr>
<td>Cattik and Odluyurt (2017)</td>
<td>4</td>
<td>Format of small group instruction using smart board media.</td>
<td>With adequate supervision, small group instruction develops the students’ digital game ability, while a game that is carried out through observational learning helps students present excellent accuracy.</td>
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| Devine et al. (2018)            | 3   | Adapted employee guidebook                                              | Significant improvement was observed in students with autism’s ability to answer the question based on their comprehension of the guidebook and maintaining that level of understanding. |%
| Biggs et al. (2018)             | 4   | Augmentative and alternative communication (AAC) with a peer tutor     | The AAC implemented along with peer tutor is observed enhancing students’ ability to use communication symbols during interactions with their peers.                                                         |
| Babb, et.al (2019)              | 1   | Vocational training using VSD (visual scene display) video             | The VSD video offers proper communication and participation reinforcement which results in increased independence and life quality for students with autism.                                                  |
| Flora, Rach, and Brown (2020)   | 3   | The Potty Patty media, a toilet training media using Discrete Trial Training (DDT) method | The potty patty is reported as an effective procedure for lowering the accident and improving students with autism’s ability to urinate in the toilet.                                                   |
### Authors | N | Learning Method or Media | Results
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Jackson and Hanlin (2020) | 2 | Intervention using RECALL combined with map concept | RECALL, combined with the map concept, is affirmed to be effective in accelerating students' correct responses to questions concerning the understanding of science texts.
Cardinal (2021) | - | Literature study | Three instructional strategies are identified as effective instructional strategies in developing students' ability to play games, namely *video modeling, pivotal response training*, and *script training*. These strategies enhance the student's ability to play games and have positive social interaction while reducing undesired behaviors.
Lee, Ho, and Bhargavi (2022) | 32 | Experiment using the *Figure Notes* teaching approach that links colors with pairing visual symbols. | *Figure Notes* presents excellent capacity in improving students' sensory processing skills and learning capability. Also, this approach enhances the tactile ability of students with autism.

### 4. Discussion

Advancements in learning media and methodology are continuously occurring to promote students' abilities, including students with special skills. Autistic students are introduced as students with special needs who face major hindrances in communication, social interaction, and repetitive limited behavior. Consequently, these students with autism require specially modified learning media and methods adjusted to their needs.

This literature study reports different learning method and media proposed and proven to be efficient for students with autism's learning process. A study conducted by Flora, Rach, and Brown (2020) and Cardinal (2021) suggest that training method is suitable for students with autism as it involves direct and repeated practices. Meanwhile, Biggs et al. (2018) report that peer tutoring implemented along with *Augmentative and Alternative*
Communication (AAC) aids students with autism to learn through direct engagement with their peers.

The adoption of learning media is also confirmed to facilitate a more effective learning process for students with autism. Studies investigating the application of video modeling (Simon and Hines, 2017; Cardinal, 2021) using video modeling and VSD (visual scene display) (Babb et al., 2019) showed that students with autism gain excellent comprehension through videos containing visual and auditory visualization. Meanwhile, Cattik and Odluyurt (2017) observed the use of smart boards using small group instruction and reported that autistic students are capable of following the game and presenting excellent accuracy. Devine et al. (2018) adopted an employee guidebook in the learning process, discovering essential skills improvement among students with autism since the students present exceptional answer showing their understanding of the guidebook and excellent skills in maintaining that comprehension.

Additionally, Flora, Rach, and Brown (2020) also discovered that the potty patty media is effective in lowering accidents and accelerating the ability of students with autism to urinate in the toilet. Also self-regulation can help them to manage their work and life balance (Tiwa, Mandang, Kumaat, & Panambun, 2022). In the other hand, teachers and parents can collaboration to optimize students’ with autism success (Ishartiwi, Azizah, Handoyo, & Suseno, 2022). The research from Jackson and Hanlin (2020) showed increased students’ ability after attending the learning using map concept, as proven by their correct answers to the science text-related questions. Also, Lee, Ho, and Bhargavi (2022) suggested that Figure Notes implementation in the learning process presents positive results, indicated by increased sensory processing and learning ability of students. Besides, figure notes are also reported to progress the tactile skills of students with autism.

5. Conclusion

Students with autism engage in a learning process using suitable learning media and methods, such as Discrete Trial Training, pivotal response training and script training, Augmentative and Alternative Communication. Training learning methods and a number of learning media have been reported to be beneficial and effective in enhancing the comprehension of students with autism. Investigation and development of effective learning for students with autism is essential to increase their academic, mental, social, emotional, and physical development, along with the ability to aid and tend themselves.

References


