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EVALUATION OF THE IMPACT OF TEKNOW EDUCATIONAL GAME ON AUTISTIC

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ABSTRACT

This study explores how students with autism at the National Autism Society of Malaysia (NASOM) react to an educational game designed by lecturers from UiTM Cawangan Pulau Pinang. A total of 27 students took part in the TeKnow educational game. We evaluated their perceptions in several areas, including cognitive development, community-university collaboration, emotional and social support, motivation, interest in the game and overall satisfaction through a pre- and post-survey analysis. The results indicate a general improvement across most areas, with particularly major changes in students' views about motivation, community-university collaboration and cognitive development. These results suggest that structured educational games can serve as inclusive teaching tools to support both the social and cognitive development of children with autism.

Keywords: Autism spectrum disorder, children, educational games, university-community collaboration, cognitive development, emotional support

INTRODUCTION

Educational games play a significant role in enhancing learning as they create interactive, engaging and meaningful experiences for children. By incorporating game elements into teaching and learning, children remain motivated and actively engaged during process of learning. Educational games also support the development of essential skills such as problem-solving, critical thinking and teamwork. Additionally, they reinforce classroom learning through practice and repetition, which contributes to improved retention of knowledge. Importantly, educational games can be adapted to different learning styles and paces, thereby ensuring accessibility for diverse learners. With the provision of immediate feedback, learners are able to identify errors and strengthen their understanding more effectively. Therefore, lecturers from UiTM Cawangan Pulau Pinang developed an educational board game named TeKnow. The game has been introduced to children with autism at the National Autism Society of Malaysia (NASOM). This initiative seeks to examine how effectively TeKnow supports cognitive development and learning among NASOM children with autism.

LITERATURE REVIEW

According to the American Psychiatric Association (2013), the characteristics of autism can be determined by difficulties with social communication as well as by restricted and repetitive patterns of behaviour and activities. These characteristics usually appear early in childhood due to the development of pathology. Children with autism spectrum disorder (ASD) commonly face problems with language, social communication and adaptive functioning. In order to enhance the complete development of children, including those with ASD, early childhood education needs to emphasise interactive and inclusive educational games. Gamification could be used in early childhood education to teach language, science, physical education and emotional competency (Lorenzo et al., 2023).

Sailer and Hommer (2020) reported that gamified learning seeks to transform traditional instruction by integrating play into the learning experience. This pedagogical strategy applies game design elements within educational contexts to enhance student motivation, engagement and overall learning outcomes

Although educational games have been shown to enhance vocabulary, motivation and social interaction among children with ASD (Gao et al., 2025), research in Malaysia remains limited. Previous studies often emphasise cognitive outcomes, but less research has been done to study emotional and social development, as well as the role of university-community collaboration in inclusive education. To address these gaps, the present study examines the impact of the TeKnow educational board game on children with autism at NASOM Pulau Pinang across six domains, thereby contributing context-specific evidence to the field of early childhood and special education.

Traditional teacher-centered approaches often struggle to sustain children's attention and may make language learning less engaging. In contrast, board games provide an interactive and participatory method that supports language development while fostering an enjoyable and inclusive learning environment. By examining the positive effects of board games on language acquisition, educators can better appreciate the potential of this playful strategy to enhance primary children's language competence and overall learning experience. Recent studies done by Al-Jawwadah and Saputri (2021) have demonstrated the exceptional ability of this entertaining strategy to improve primary children's English language proficiency while making the learning procedure one that is both entertaining and interactive. Barekat (2023), says teachers can teach the most material to the most students in the shortest amount of time by using educational games. Consequently, the present study examined how board games affected students' learning, motivation for their studies and self-esteem.

Parekh et al., (2021), mention in their research that creating board games is a useful way to help young people learn about environmental issues. Heim and Holt (2021) said that student-developed games are an effective way to engage learning class that is enjoyable, collaborative and requires creative application of the course content. While students developed various game formats and focused on different unit learning objectives, instructor and peer review indicated that the games created for this assignment were both conducive to learning and highly accessible.

Due to its many benefits, board games have become increasingly popular for language acquisition. Students are encouraged to actively participate with the English language through the fun and dynamic atmosphere that board games offer as been discussed by Li et al. (2022). Students are able to apply what they have learned in a meaningful way through board games that encourage language practice in a setting that mimics real-life circumstances.

Harisa et al. (2022) mention that board games also provide chances for teamwork and social engagement, which promotes the growth of communication abilities. In order to provide lifetime services to the community of individuals with autism in Malaysia, a group of parents and professionals founded the National Autism Society of Malaysia (NASOM) in 1986. It aims to offer a variety of support services to help people with autism, particularly children and their close family members. It was registered as a national nonprofit organization on March 3, 1987. To address the needs of children with autism, NASOM offers a variety of services, information, and intervention. There are 13 centrals of NASOM all over Malaysia. In this study, NASOM Pulau Pinang are involved.

METHODOLOGY

A total of 27 students from NASOM's Pulau Pinang branch participated in this pilot study. The TeKnow educational game was introduced to them. TeKnow is a board game inspired by the Snakes and Ladders game. Compared to the existing game, TeKnow was being developed slightly different in a unique way (Wan Anisha et al., 2023). This game consists of a 10 x10 feet colourful board with playground design made with canvas materials. On the board, instead of using gridded squares, they are represented by a curve design similar like a snake body from the start until the end of the game. The curve line is separated into 50 spaces with a letter on it. Instead of snake and ladder, TeKnow uses ropes and ladders on the board. TeKnow also consists of a large die, a guideline card for the instructor and a few cards which consist of questions on spelling and vocabulary for the instructor to refer. Each card was printed on a laminated A5 thick paper size. Figure 1 shows the design of the TeKnow board.

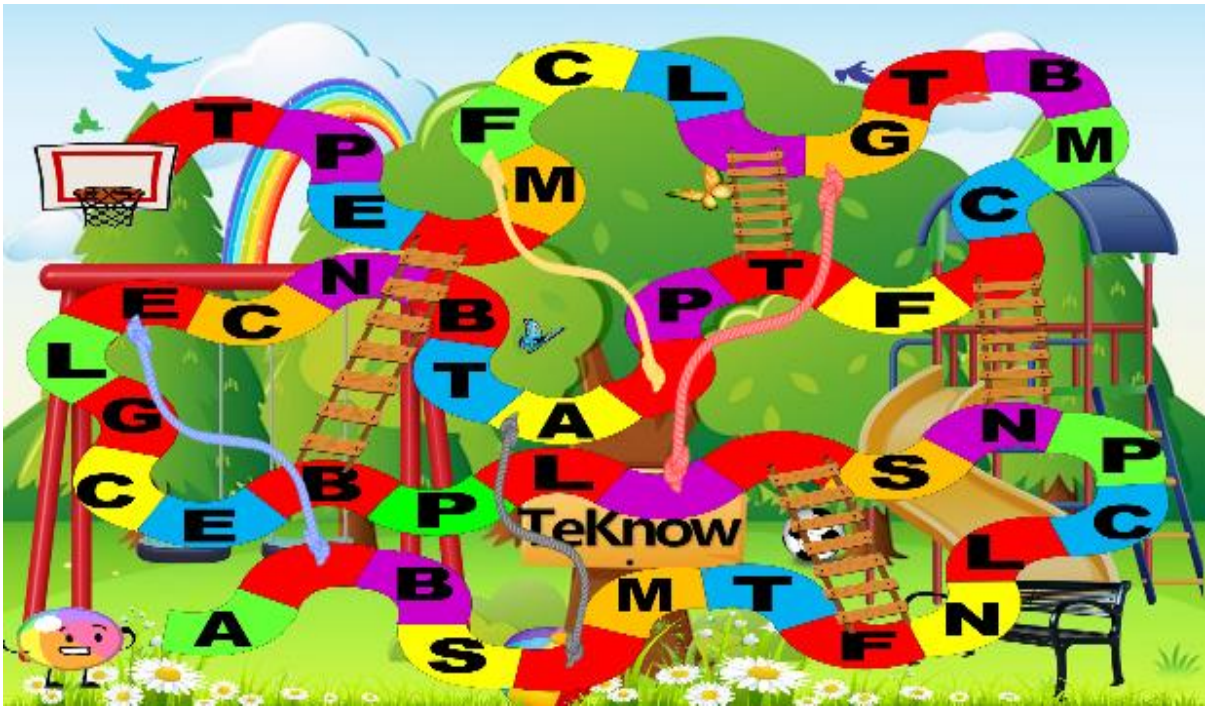


Figure 1. TeKnow Board Design.

TeKnow is designed specifically for students of various age groups. It asks simple English questions to help improve students' vocabulary and spelling skills, with difficulty levels tailored to different stages. Through this game, players not only have fun but also get the opportunity to test and enhance their knowledge of vocabulary and spelling. Additionally, the game can be customized to accommodate students with disabilities. TeKnow can be played with a maximum number of 5 players and 1 instructor. Figure 2 shows the flow on how to play TeKnow.

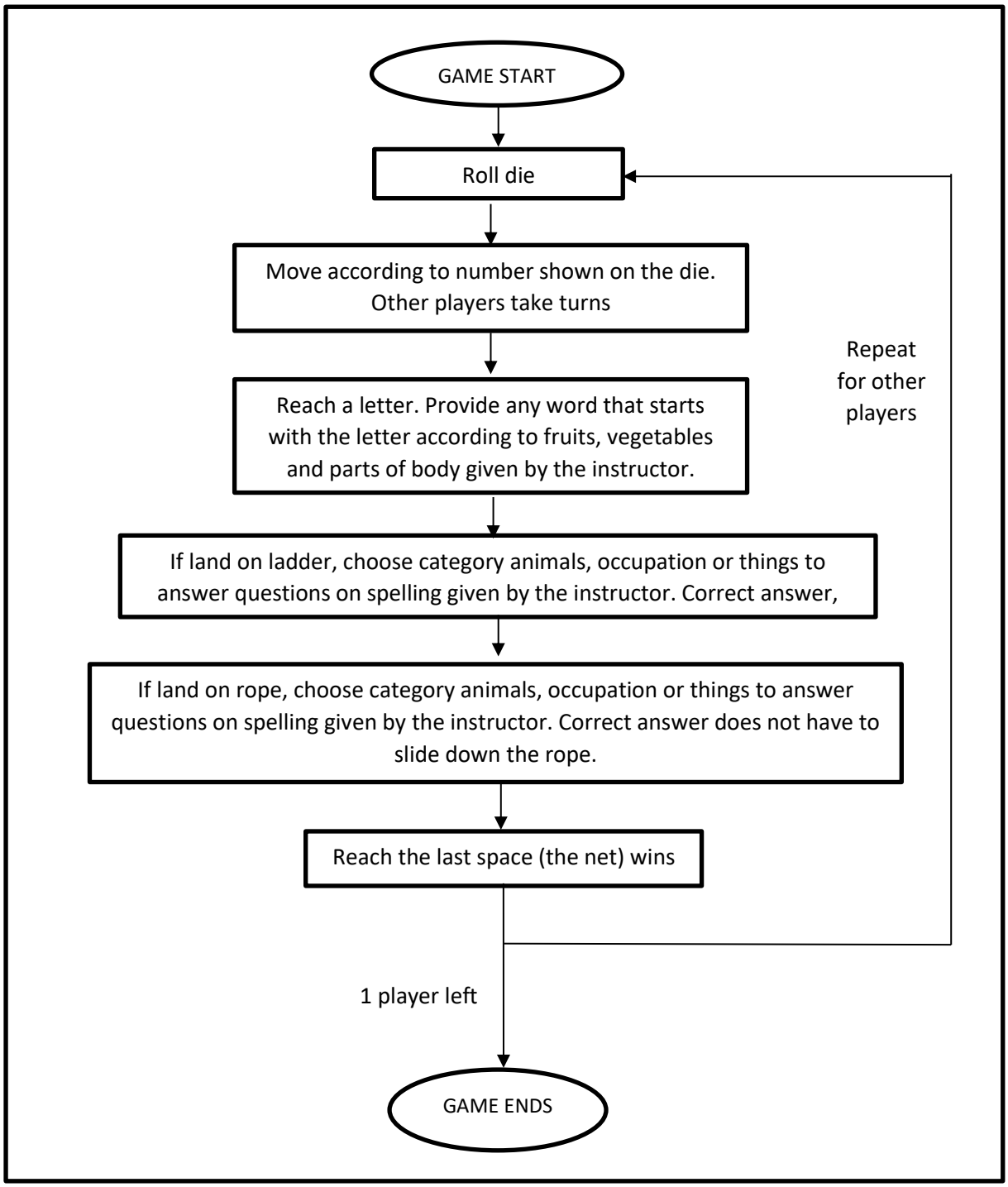


Figure 2. Flow of TeKnow Game.

Focusing on vocabulary and spelling through the TeKnow game not only addresses core linguistic deficits but also contributes to the broader developmental needs of children with ASD, including communication, self-expression and their participation.

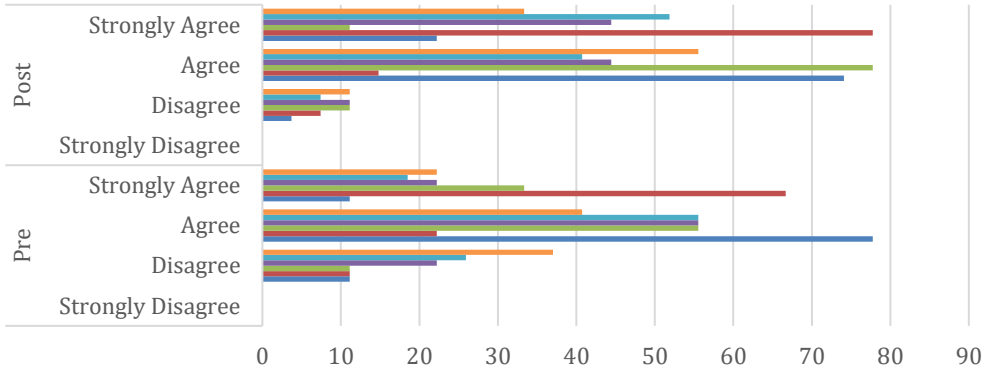
This study seeks to examine the impact of the TeKnow educational game on NASOM students' perceptions across six key areas. To assess these effects, students completed a questionnaire before and after playing the game, with NASOM teachers providing assistance during the survey process. Data from both pre- and post-programme assessments were collected to measure students' perceptions in the following six domains:

1. Cognitive development
2. University-community collaboration
3. Emotional and social support
4. Motivation for leading a positive life
5. Interest in replaying the game
6. Overall satisfaction with the programme

As this was a pilot test, the questionnaire was primarily intended to assess feasibility and item clarity rather than to establish full psychometric properties.

RESULTS

The findings from the pre-and post-programme surveys reveal several significant trends with data presented in Figure 3.



	Pre				Post			
	Strongly Disagree	Disagree	Agree	Strongly Agree	Strongly Disagree	Disagree	Agree	Strongly Agree
Overall, I am satisfied with this programme	0	37	41	22	0	11	56	33
I am interested in playing this game again	0	26	56	19	0	7	41	52
I am motivated to live a cheerful life with the support of any programme	0	22	56	22	0	11	44	44
I received emotional and social support from any association or support body	0	11	56	33	0	11	78	11
This game fosters collaboration between the university and the community	0	11	22	67	0	7	15	78
This game improves intelligence	0	11	78	11	0	4	74	22

Figure 3. Comparison of Participant Perceptions Before and After the Programme.

Figure 3 shows how participants' views changed before and after the programme in six different areas. More participants thought the game helped their thinking skills, with the number of participants strongly agreeing going up from 11% to 22%. Cooperation between the university and the community also got better, with agreement about working together rising from 67% to 78%, and fewer participants disagreeing. Emotional and social support showed stable results. Before the program, 56% of participants agreed and 33% strongly agreed, while after the program, agreement increased to 78% and strong agreement decreased to 11%. Motivation showed a modest improvement, with overall agreement increasing from 78% before the programme to 88% after. While, the proportion of students strongly agreeing doubling from 22% to 44%. Interest in replaying the game was high, with more than half (52%) strongly agreeing. Overall satisfaction was positive, with 89% of participants satisfied with the program, although a minority (11%) reported dissatisfaction.

DISCUSSION

The results of this study show that the TeKnow educational game has made a big positive impact on helping children with grow their thinking skills and feel better emotionally. The game kept the children interested and made them feel like their thinking skills had gotten better. This is shown by the fact that more children strongly agreed that the programme helped their thinking skills after they finished it, going up from 11% to 22%. These results highlight how useful interactive, game-like learning tools can be in improving important skills like critical thinking, problem-solving and adaptability for children with ASD.

The programme has clearly helped the university and the community work together better. The data shows that 67% to 78% agree that the university and community are cooperating well. This shows that such programmes not only help children but also improve the relationship between schools and local groups. This is important because it shows how education programmes can help build a supportive environment for communities in need, especially those with special needs.

However, the detailed results about emotional and social support need a closer look. While more children agreed that they received emotional and social support after the programme (from 56% to 78%), fewer children strongly agreed (from 33% to 11%). This shows that even though more participants noticed the support, the strength or quality of that support might not have been as good as they hoped.

Meanwhile, a total of 44% of participants strongly agreed that the programme using the TeKnow board game improved their motivation in life. This finding is consistent with Olykaynen (2016), who reported that board games can enhance children’s overall well-being. In addition, more than half of the participants strongly agreed that they were interested in replaying the game. This finding supports the view that board games are effective tools for enhancing learning through play, including for children with ASD.

Furthermore, game-based approaches have been shown to enhance motivation and support gradual learning progression for individuals with ASD (Nerea & Esther, 2023). This outcome is very important for making the programme better in the future. While the TeKnow initiative has been very successful overall with 89% of participants satisfied, adding certain elements to help with the emotional challenges of children with ASD could make it even more effective.

For example, including more activities that build emotional strength, encourage friendships among students and provide mentorship could help close the gap in satisfaction and make sure the programme fully supports the students' needs.

CONCLUSION

This research offers useful information about how well educational games like TeKnow work for children with ASD. The results show that the programme helped improve children's thinking skills, motivation and their views on collaboration between universities and communities. Although most participants were happy with the programme, there is still a need to improve emotional and social support Expanding the use of educational games can help ensure that children with ASD are not excluded from meaningful learning opportunities. Future studies could test the programme in other NASOM centres to see if it works in different places and to check its long-term effects on children with ASD.

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