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Teaching High Functioning Children with Autism: Considerations for Vocabulary Course Design Using Technology

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Abstract
This paper highlights one of the most critical aspects of facilitating vocabulary learning among children with autism. Several pertinent issues serve as the focus of the paper; vocabulary course design for high functioning children with autism and the relevant considerations required when teaching them using technology. To explore these issues, a qualitative design using content analysis through extensive literature review was conducted. The content analysis included a critical examination of the features of children with autism and their learning and the theories of vocabulary course design and its principles. The analysis brought to light relevant considerations following the five factors as identified from the critical examination of the literature. Hence, this paper proposes course design for high functioning children with autism considerations. Curriculum designers, syllabus writers and instructors for children with autism could expect to benefit from this paper. This paper also recommends quantitative research such as a survey with the relevant stakeholders to confirm or enrich the data from the present study.
Keywords: Autism spectrum disorders, high functioning children with autism, technology in education, vocabulary course
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1. Introduction

At least two of the UNESCO's Sustainable Developmental Goals (SDG) could be related to children with autism, namely, Quality Education (SDG 4) and Reduced Inequalities (SDG 10). World Health Organization (WHO) has estimated that one in every 160 children is born with Autism Spectrum Disorders (ASD) (2020). As the number of children with autism attending school continues to grow, concerted efforts toward developing quality education for the special group of children are taken (Kellems, Eichelberger, Cacciatore, Jensen, Frazier & Simons, 2020).

Interestingly, the rise of the Fourth Industry Revolution (IR4.0) in recent years has leveraged the uses of digital technology exponentially. Way of life and work transform accordingly with the upsurge of the relevant 21st century technology. Key to human and nation development, education, is mainly affected by the need to transform in line with the technology. The children with autism have particular issues that require attention when it comes to including technology in their education. One area that needs further exploration is technology in teaching language and communication to children with autism (Sarker, Linkon, Bappy, Rabbi & Nahid, 2021).

This paper will explore relevant theories underpinning the design of an English language vocabulary course for children with autism using technology such as Virtual Reality (VR). Several critical discussions based on an in-depth literature review include core features of children with autism, instruction methods for children with autism, technology use in teaching children with autism, and English vocabulary modules design principles for high functioning children with autism (HFA). Hence, this paper may be reference to curriculum developers, module designers, and language instructors for HFA.

2. Literature Review

2.1 Core features of children with Autism

Autism Spectrum Disorders (ASD) is a form of neurological development disorder that hinders children from being socially and communicatively competent. Lucas, Thomas and Norbury (2017) further supported that children with autism often display a low level of engagement, specifically in social activities. This situation, in turn, could limit the learning that usually occurs among their developing peers. Some of the common reasons that hinder the abilities to be socially and communicatively competent are their restricted and repetitive patterns of behavior and their hypersensitivity towards sensory processing.

In addition, children with ASD can be extensively distinctive in their communication impairments (Sarker et al., 2021). Lucas et al. (2017) state that "*we also examined indeterminable and inaccurate response rates, but on this measure there were no group differences*" (p.8). This implies that although there is a significant percentage of children with ASD population who are unable to speak throughout their life stages, there are still some that may communicate the normal range of function. In language learning, some children with ASD show deficiency in certain aspects of language learning, such as speech function, grammar, and pragmatics. The children are also prone to have some challenges in the following elements; auditory processing, vocabulary production, perception of phonemes, higher-order semantics, syntax, pragmatics, or prosody (Lucas et al., 2017). The challenges provide potential areas for curriculum designers, course

developers and instructors to work on in facilitating the learning of the children with autism, especially the high functioning children (HFA).

Recent literature demonstrated constant issues faced by children with autism in communication and social interaction across diverse contexts. Berenguer, Rosello, Baixauli, Garcia and Miranda (2020) claim that "*on measures of Peer problems and Prosocial behavior, the means of both the Cluster with Lower ToM abilities and the Cluster with Higher ToM abilities are in the borderline/abnormal range*" (p.10). This shows that children with autism tend to have challenges with pro-social behavior, indicating their communication and social interaction impairment. These impairments are expressed in behaviors such as inappropriate affect, social isolation, and failure to initiate interactions with peers, cooperate, share, make friends, express empathy, or provide emotional support (Sansosti & Powell-Smith, 2006). Similarly, these social disabilities may cause daily difficulties, and lead to adverse long-term outcomes. Similarly, this opens an opportunity for the relevant experts working with children with autism to focus on. Efforts are needed to facilitate the development of children with autism's communication and interaction development. One of the efforts is to design and develop an appropriate language course for them using a platform such as technology that could ease and encourage social interaction among children with autism.

Children with ASD also experience prevalence issues in their behavioral and sensory. Vicker (2009) claims that problematic behaviors in children with HFA are diverse and it tends to vary according to the child's development and intellectual ability. Although stereo-typed, repetitive behaviors such as body rocking or hand flapping may occur in individuals with HFA, specifically during highly stressful situations. More often, children with HFA engage in restricted behaviors and insist on doing things in a certain way (Sansosti & Powell-Smith, 2006). Any change in such routines is often perceived as complex and may result in aggressive or tantrum behaviors.

Individuals with autism may face a range of difficulties with attention. Specific deficits in attention have significant implications for development in communication and social development (Alberta Learning, 2003). As reported in Alberta Learning (2003), children with autism often have difficulty attending to relevant cues and, or information in their environment. They may also have problems disengaging and shifting attention from one stimulus to the next, contributing to some observed rigidity and resistance to change. Another feature of autism is impairment in the capacity to share attention, is referred to as joint attention. This feature also suggests their short attention span. Likewise, besides the challenges they face in communication and interaction, as discussed earlier, the challenges the children with autism face due to their behavior may suggest a dire need of a course design developed with these challenges in mind.

2.2 Vocabulary instructions methods for children with Autism

To effectively teach children with autism, each task should be decomposed into smaller parts and taught in an incrementally manner (Simpson, de Boer-Ott & Smith-Myles, 2003). In the context of vocabulary teaching, words should be easy to read, understand, and learn. Recent discoveries (Khowaja, Robins & Adamson, 2018; Omar & Bidin, 2015; Lucas et al., 2017) found that visuals may greatly aid the acquisition of vocabulary learning in children with autism. To illustrate, Omar and Bidin (2015) discovered that multimedia graphic and text helps the reading process of children with autism, thus increasing their vocabulary acquisition. Children with autism

are visual learners, which explains why multimedia graphical instructional prompts are crucial in teaching vocabulary to children with autism (Khowaja et al., 2018). The following are some teaching strategies according to Khowaja et al. (2018);

1. Reward allows players to strengthen their skills, and as an incentive to motivate players to continue using it.
2. Proper feedback at the end of every activity performed by users helps them to improve their performance and perform well in future activities.
3. Practice and drill help players improve their knowledge by repeatedly practicing tasks a few times in a row. This strategy will help them perform activities through trial and error in which each child progresses at their own pace; they can go back and practice more to improve their learning.
4. Repeat allows the children to perform tasks several times. Hence, when they think they face difficulties in understanding certain aspects of the study, they can efficiently work on it repeatedly and improve.
5. Choice lets the children make a working plan of how they wish to perform tasks based on their current progress and performance.
6. Incremental provides access to learning material and activities on a progressive basis. This situation allows the children to complete prerequisite material and activity before attempting and mastering complex material and training.

2.3 Technology use in teaching children with Autism

An intervention tool, such as Virtual Reality (VR), could address the issue of poor social interaction among children with autism. Since VR provides an environment that coaches the participants realistically, the environment could be manipulated and altered to the characteristics and capabilities of the selected subjects, who, in this case, are the children with autism (Halabi, Aljaam, ElSeoud & Alpona, 2017). Technology such as VR is a reinforcement tool that can help ASD children to be more independent. In other words, they are given opportunities to recognize their difficulties and improve their strengths.

Research on technology use in education has proven technology to be beneficial as a learning therapy for children with ASD. They often encounter difficulties in developing proper social communication skills (Halabi et al., 2017). In their research, Halabi et al. (2017) wanted to investigate how VR could facilitate communication skills among individuals with autism. Interestingly, the experimental research compared three different display types, namely, a non-VR standard desktop screen, head-mounted display (HMD), and computer augmented virtual environment (CAVE). Working on children with autism as the participants of their experiments, they discovered that the children with autism showed more improved performance in the CAVE than in the HMD and desktop. Their findings paved the way forward in the use of technology such as VR and AR in teaching children with autism. Expressly, their results indicated that immersive VR could be more satisfactory and motivational than desktop for children with ASD.

Sarker et al. (2021) also conducted another exciting research on using technology in teaching children with autism. They were interested to discover how to improve joint attention in children with autism. The study focused on using AR-VR-enabled game approach as a means to enhance

joint engagement. From their findings, Sarker et al. (2021) confirmed that several treatments and intervention strategies could facilitate behavioral development of children with autism. They proposed a game-based approach using VR-AR to enable the children to interact with digital models through problem-solving activities. Sarker et al. (2021) confirmed that "*all the strategies or therapy that has been used for leveraging autistic people are mainly focused on strengthening their joint attention*" (p.3) where in their study, the inclusion of interactive multi-staged game module, which included real-life situations was able to facilitate the targeted behavior development such as joint attention

Besides these past studies, the last decade has seen various researches on technology use and children with autism. The researches have confirmed technology could facilitate the children's development and improvement in i) employment skills (Smith et al., 2014; Walker, Vasquez & Wienke, 2016), ii) academic skills, namely Mathematic skills (Kellems, Eichelberger, Cacciatore, Jensen, Frazier, Simons & Zaru, 2020) and Science vocabulary (McMahon, Cihak, Wright & Bell, 2016), and iii) behavioral skills (Escobedo, Tentori, Quintana, Favela & Garcia-Rosas, 2014). In brief, the use of technology as an educational platform for children with autism has potential. The use of visual effects, multimedia graphics as prompts, and materials presented in a manner that keeps the children with autism to be amused and to stay focused are among the reasons why technology has the potential.

In determining the impact of technology on teaching children with autism, Valencia, Rusu, Quinones and Jamet (2019) have concluded positive outcomes from their meta-analysis of 94 past studies that showed how technology in educational contexts helps individuals with autism. Most interesting, their analysis concluded how technology is a potential platform in terms of its user experience, usability, accessibility, and how game elements enrich learning environments for individuals with autism. Valencia et al. (2019) concur that technological advancements such as virtual agents, artificial intelligence, and virtual and augmented reality undoubtedly provide comfortable environments that promote constant learning for individuals with ASD.

2.4 Technology and vocabulary course design principles for children with Autism

Along with the modern landscape of technology in education, children with autism should also have the opportunity to experience technology in their learning. The core features of children with autism, appropriate vocabulary instructions methods, and the use of technology in teaching children with autism are already discussed. Upon grasping those major concepts, elaboration on the applicable principles on vocabulary course design for children with autism using technology is appropriate next.

In terms of learning style, Khowaja et al. (2018) agree that children with autism are often visual learners. Therefore, visual strategies may help the children make better sense of the world around them. Children with autism are very optical, and they tend to be self-absorbed if a topic amuses them (Craig & Trauner, 2018). Craig and Trauner (2018) suggest game-like activities to facilitate the children's learning. To create a practical learning experience for children with autism, the instructors should create a learning environment similar to playing games (Khowaja et al., 2018).

Additionally, Khowaja et al. (2018) posit that if a designer plans to design any learning environment for children with ASD, they must consider common characteristics of these children. Kamaruzaman, Md Noor and Azahari (2016) have also concluded an important aspect in designing a numeracy app known as TaLNA in enhancing the learning of the children with autism through their research. According to them, the most important set of considerations when designing any technology-related platform for the children with autism is having vast knowledge on the background of the children with autism, keeping them focused, and encouraging a gradual development of the target taught item through visual, interactive multimedia graphics.

3 Methods

A qualitative research design was adopted in determining the research methodology that would assist in eliciting relevant data for the present study. Content analysis through vast literature review was conducted in confirming factors that need consideration when designing vocabulary course for children with autism. Content analysis is a common research tool within the qualitative research design when the focus is to determine themes or concepts. There are five steps in conducting content analysis namely; 1) choose the texts (literature review) based on the research question, 2) define the units and categories of analysis, 3) develop a set of rules for coding, 4) code the text according to the rules and 5) analyze the results and draw conclusions (Kuckartz, 2019; Erlingsson, 2017).

This study followed the five steps closely by focusing on the literature review that was determined based on the research question – what are the factors to be considered when designing vocabulary course for children with autism? The units and categories of analysis were defined following the principles of course design and characteristics of children with autism as language learners. The coding was then developed based on the identified key factors from the literature review. Finally, the analysis was done to draw the conclusions, which eventually led to the identification of relevant factors to be considered for the vocabulary course for children with autism. In content analysis, the results of the analysis and discussions are done simultaneously as follows.

4 Results and Discussions

When discussing vocabulary course design principles, several factors need to be given consideration (Hutchinson & Waters, 1987). The factors are; a) Needs analysis, b) Course goals, c) Learning objectives, d) Delivery methods and strategies, and e) Assessments. The following are discussions on a potential vocabulary course design using technology for children with autism based on these five aspects. The discussions bring into a light relevant literature review on the i) core features of children with autism, ii) their learning, and iii) the potentials of technology use in teaching vocabulary to children with autism.

4.1 Needs analysis

At the onset of any new course design and development, needs analysis is essential. According to Hutchinson and Waters (1987), needs analysis provides relevant information needed by any course designer to determine the content of the language course and teaching process, which includes the teaching materials, activities, and evaluation strategies. Brown (1995) asserts that needs analysis guides the selection of the teaching contents and process. It is conducted by

collecting relevant information that depicts the target and learning needs. Berwick (1989) concurred by claiming that needs analysis is determining the gap between what is and what should be.

In designing and developing a language course for children with autism, a course designer would need to understand what skills and level of competencies would be ideal for the targeted group of children with autism, and in this instance, the HFA. Determining what the children are already capable of doing and confirming what else they need to be able to do with the language to be able to participate and function in their community is a good start for the needs analysis. Several measures could be considered when the required info is sought. First, as the children with autism work closely with their instructors on a one-on-one basis, the instructors could be the target respondents. In addition, the parents who usually play a big part in the children's learning process while at home could also be referred to for the relevant information.

4.2 Course Goals and Learning objectives

Upon the conduct of needs analysis, Hawkey (1980) emphasizes the importance of developing course goals and learning objectives. Information about the children with autism, collected through the needs analysis, provides essential lead in determining and writing-up the course goals and learning objectives. In any language course, aspects such as language skills, functions, and forms are necessary. Regarding the vocabulary course for children with autism, the specifications covering those aspects are equally essential. Unlike the traditional and regular students, children with autism, specifically the HFA, having their unique learner profiles based on their core features, need proper and carefully thought course goals and objectives. In this context, the course goals and learning objectives should be achievable by the HFA.

As the course goals and learning objectives need to specify the desired competencies upon the completion of the course, they need to be written with the capabilities of the HFA in following the course entirely and successfully in mind. The insights from their instructors and parents could be referred to in assessing the viability of the course goals and objectives. Past studies on the design and development of new courses for children with autism have suggested the objectives to be specific and sequenced in the order of simpler to more complex task accomplishment (Smith et al., 2014; Escobedo, Tentori, Quintana, Favela & Garcia-Rosas, 2014; Walker, Vasquez & Wienke, 2016; McMahon, Cihak, Wright & Bell, 2016; Kellems, Eichelberger, Cacciatore, Jensen, Frazier, Simons & Zaru, 2020). The keyword is task accomplishment instead of knowledge and performance. Hence, it is easier for course developers to form language course goals that focus on the children with autism's learning needs, which enable them to participate and function in society.

4.3 Delivery methods and activities, and assessments

Following the development of the course goals and learning objectives, the feasibility of the materials, activities, and evaluation strategies is the next consideration needed. As stated in a vast literature, the core features of children with autism related to their communication, social interaction, and behaviour are significant and distinctive. Hence, designing and developing a vocabulary course for them, particularly one that leverages the use of technology would require instantaneous examination of the use of technology in delivering the contents, activities, and evaluation strategies for the children with autism.

In deciding on the delivery methods and activities, Simpson et al. (2003) have specified that each task should be decomposed into smaller parts and taught in an incrementally manner. Relating this notion to vocabulary training, they stated that the words should be easy to read, understand, and learn. Similarly, teaching children with autism could also be assisted by visual effects (Khowaja et al. , 2018; Omar & Biddin, 2015; Lucas et al., 2017). The visual effects could even be made more fitting for children with autism if game-like activities are to be developed (Craig & Trauner, 2018).

As the children with autism have issues with their attention span (Alberta Learning, 2003), Khowaja et al. (2018) stated that "*both the M-CHAT-R/F and STAT address core domains of behaviors related to ASD symptoms, such as use of gestures or other nonverbal communication, imitative behavior, play skills, and joint attention behavior*" (p.3) which implies that there is a need to be compelling learning experiences similar to playing games. Additionally, game-like activities serve as a suitable method for instructors to assess children with autism. Each material is presented in a manner that increases its task difficulty. The critical point of the material presented is they are provided with visual effects to enable the children with autism to stay focused. This strategy is apparent since children with autism are optical and easily self-absorbed when engaging with amusing items (Craig & Trauner, 2018). Finally, the game-like approach in presenting the materials and conducting the activities could provide a relevant alternative in assessing the children with autism.

5 Conclusion

This paper believes that all children should never be left behind. Echoing at least two of the UNESCO's SDGs (SDG #4 Quality Education and #10 Reduced Inequalities), children with autism are given special attention. Children with autism are a group of potential learners that could strive in their learning through thorough considerations of their learning environment governed by the design and development of relevant course design. Discussions on the design principles of modules using technology for high functioning children with autism presented in this paper should be able to shed some light on prospective curriculum developers, course designers, and instructors. The children's features, which are their impairment in communication, interaction, and behavior as well as the use of technology and principles in developing courses using technology, have been elaborated. The added value put forth in this paper is that it examines all of these aspects in designing a vocabulary course using technology, with the main emphasis on children with autism.

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References:

Alberta Learning. (2003). *Teaching students with autism spectrum disorders: A guide for educators*. Edmonton: British Columbia Ministry of Education and Saskatchewan Education, Canada.

Berenguer, C. Rosello, B., Baixauli, I., García, R. & Miranda, A. (2020). *Theory of Mind Profiles in Children with Autism Spectrum Disorder: Adaptive/Social Skills and Pragmatic Competence*. Frontiers in Psychology. Retrieved from https://doaj.org/article/4f7ad1dcc0564b528d3d61a4809ed2d9

Berwick, R. (1989). *Needs assessment in language programming: from theory to practice*. In R Johnson (Ed) The second language curriculum. Cambridge: Cambridge University Press. Retrieved from https://doi.org/10.1017/CBO9781139524520

Brown, J. (1995). *The Elements of Language Curriculum: A Systematic Approach to Program Development,* New York: Heinle and Heinle Publishers, USA. Retrieved from https://eric.ed.gov/?id=ED397672

Craig, M. & Trauner, D. (2018*). Comparison of Spontaneously Elicited Language Patterns in Specific Language Impairment and High-Functioning Autism.* In *Pediatric Neurology*, *79*, p. 53-58. Retrieved from https://doi.org/10.1016/j.pediatrneurol.2017.09.017

Erlingsson, C. (2017). A hands-on guide to doing content analysis. In *African Journal of Emergency Medicine*, 7(3), p. 93-99. https://doi.org/10.1016/j.afjem.2017.08.001

Escobedo, L., Tentori, M., Quintana, E., Favela, J., & Garcia-Rosas, D. (2014). *Using augmented reality to help children with autism stay focused*. In *IEEE Pervasive Computing*, *13(1)*, p. 38–46. https://doi:10.1109/ MPRV.2014.19

Halabi, O.; Aljaam, J.M.; ElSeoud, S. and Alpona, H. (2017). *Design of immersive Virtual Reality system to improve communication skills in individuals with autism*. In *International Journal of Emerging Technologies in Learning*, *12 (5)*. https://doi: 10.3991/ijet.v12i05.6766

Hawkey, R. (1980). *Syllabus Design for Specific Purposes, ELT Documents Special, Projects in Materials Design*, London: The British Council.

Hutchinson, T. and Waters, A. (1987). *English for Specific Purposes: A Learner-Centred Approach.* Cambridge: Cambridge University Press, UK. http://dx.doi.org/10.1017/CBO9780511733031

Kamaruzaman, M. F., Noor, H. M., & Azahari, M. H. H. (2016). *Developing TaLNA: A numeracy learning application for children with autism.* The Turkish Online Journal of Educational Technology

Kellems, R. O., Eichelberger, C., Cacciatore, G., Jensen, M., Frazier, B., Simons, K., & Zaru, M. (2020). *Using video-based instruction via augmented reality to teach mathematics to middle school students with learning disabilities*. In *Journal of Learning Disabilities*, *53(4)*, p. 277-291. Retrieved from https://doi.org/10.1177/0022219420906452

Khowaja, M., Robins, D. L. & Adamson, L. B. (2018). *Utilizing two-tiered screening for early detection of autism spectrum disorder*. In *National Autistic Society, 22(7)*. Retrieved from https://doi.org/10.1177%2F1362361317712649

Kuckartz, U. (2019). Qualitative text analysis: a systematic approach. In Kaiser, G., Presmeg, N. (Eds.) *Compendium for Early Researchers in Mathematics Education ICME-13 Monographs*. Springer. https://doi.org/10.1007/978-3-030-15636-7_8

Lucas, R., Thomas, L. & Norbury, C. F. (2017). *Can Children with Autism Spectrum Disorders Learn New Vocabulary from Linguistic Context?* In *Journal of Autism and Developmental Disorders, 47(7),* p. 2205-2216. Retrieved from https://doi.org/10.1007/s10803-017-3151-z

McMahon, D. D., Cihak, D. F., Wright, R. E., & Bell, S. M. (2016). *Augmented reality for teaching science vocabulary to post-secondary education students with intellectual disabilities and autism*. In *Journal of Research on Technology in Education*, *48(1),* p. 38–56. Retrieved from https://doi:10.1080/15391523.2015.1103149

Omar, S. and Bidin, A. (2015). *The impact of multimedia graphic and text with autistic learners in reading*. In *Universal Journal of Educational Research*, *3 (12),* p. 989-996. Retrieved from https://doi: 10.13189/ujer.2015.031206

Sansosti, F. J. & Powell-Smith, K. A. (2006*). Using Social Stories to Improve the Social Behavior of Children with Asperger Syndrome*. Retrieved from https://doi.org/10.1177%2F10983007060080010601

Sarker, S.; Md Linkon, A.H.; Bappy, F.H.; Rabbi, M.F. and Nahid, M.M.H. (2021). *Improving joint attention in children with autism: a VR-AR enabled game approach*. In *International Journal of Engineering and Advanced Technology*, *10 (3).* Retrieved from https://doi:10.35940/ijeat.C2201.0210321

Simpson, R. L., de Boer-Ott, S. R., & Smith-Myles, B. (2003). *Inclusion of Learners with Autism Spectrum Disorders in General Education Settings.* In *Topics in Language Disorders, 23(2),* p. 116–133. doi:10.1097/00011363-200304000-00005

Smith, M. J., Ginger, E. J., Wright, K., Wright, M. A., Taylor, J. L., Humm, L. B., Olsen, D. E., Bell, M. D., & Fleming, M. F. (2014). *Virtual reality job interview training in adults with autism spectrum disorder*. In *Journal of Autism and Developmental Disorders*, *44(10)*, p. 2450–2463. https://doi.org/10.1007/s10803-014-2113-y

Valencia, K.; Rusu, C.; Quinones, D. and Jamet, W. (2019). *The impact of technology on people with autism spectrum disorder: a systematic literature review*. In *Sensors*, *19*. Retrieved from https://doi.org/10.3390/s19204485

Vicker, B. (2009). *Social communication and language characteristics associated with high functioning, verbal children and adults with autism spectrum disorder*. Bloomington, IN: Indiana University, Indiana Institute on Disability and Community. Retrieved from http://hdl.handle.net/2022/9541

Walker, Z., Vasquez, E., & Wienke, W. (2016). *The impact of simulated interviews for individuals with intellectual disability*. In *Journal of Educational Technology & Society*, *19(1),* p. 76–88.