JURNAL PENDIDKAN BITARA UPSI
Vol. 14 Special Issue 2 (2021) / ISSN 1394 -7176 (47-56)

This article was carefully selected from
4th International Conference on Special Education (ICSE) 2021,
organized by The Southeast Asian Ministers of Education Organization
Regional Centre for Special Educational Needs (SEAMEO SEN)

PREPARING MALAYSIAN PRE-SERVICE TEACHERS TO TEACH STUDENTS WITH AUTISM USING E-MODULE 'THE STORY OF KHAMDY'

Hui Min Low; Lay Wah Lee; Aznan Che Ahamd; Sin Yin The;
Nur Zafirah A. Khadar
Universiti Sains Malaysia, Malaysia
lowhm@usm.my

Published: 07 December 2021

To cite this article (APA): Low, H. M., Lee, L. W., Che Ahamd, A., The, S. Y., & A. Khadar, N. Z. (2021). Preparing Malaysian Pre-Service Teachers to Teach Students with Autism Using E-Module 'The Story of Khamdy'. *Jurnal Pendidikan Bitara UPSI*, *14*, 47-56. https://doi.org/10.37134/bitara.vol14.sp2.5.2021

To link to this article: https://doi.org/10.37134/bitara.vol14.sp2.5.2021

ABSTRACT

Despite increased awareness about autism, knowledge and skills to teach students with autism remains low among pre-service teachers globally. An e-module called 'The Story of Khamdy®' was developed to provide a means of introducing as many as 140 information and pedagogical strategies to teach students with ASD in inclusive environments. The entire module is presented through online platforms, via Facebook and Openlearning. Inspired by the pictorial narrative approach, each component in this module is specially designed to optimise the learning outcomes. This module, the first of its kind, delivers the content via pictorial narration, in which over 200 illustrations are presented sequentially for a systematic learning on the topics of identifying autism, early diagnosis and intervention, disputing the myths of autism, family and inclusion support, social communication strategies, differential instructions, preventing of bullying, and transition to puberty and adulthood. This study was conducted to assess the efficacy of this e-module to improve autism knowledge and reduce autism-related stigma among 91 pre-service teachers who had completed this online module. The pre-training and post-training autism knowledge and stigma scores were measured using Autism Stigma and Knowledge Questionnaire (ASK-Q). Significant changes in etiology and treatment knowledge scores, together with a significant reduction in stigma endorsement were recorded. Overall, the findings pointed to the efficacy of this module to better prepare pre-service teachers to teach students with autism.

Keywords: Autism Spectrum Disorder, e-Module, Teacher Training, Special Education

INTRODUCTION

Autism is a neurologically-based developmental condition, characterised by difficulties in social interaction and restricted and repetitive behaviours (WHO, 2021; APA, 2013). Scientific evidence suggests that various genetic and environmental factors could contribute to the onset of autism (Hodges, Fealko, & Soares, 2020; Jick & Kaye, 2003). In early childhood, the signs of autism include not responding to name call, no eye contact, no pointing and showing, use of jargon, restricted interest and play, and atypical responses to sensory stimulation (Low, 2019). Autism is a lifelong disorder, which the symptoms and affected areas can

evolve over time from early childhood to adulthood (Ozonoff et al., 2018, Rattaz et al., 2018). Despite that autism is a lifelong condition, early diagnosis and intervention has been found to effectively reduce the negative outcomes of autism (Fuller & Jaiser, 2018; Nahmias et al., 2019). Many children with autism, who were identified early and who were being given the right support and intervention, were found to achieve good social communication and educational outcomes (Dimian, Symons, & Wolff, 2021; Fuller & Jaiser, 2018)

Empowering Teachers to Teach students with autism in Malaysia

According to the National Autism Society of Malaysia, approximately 9000 children in Malaysia are born with the condition of autism every year (NASOM, 2021). With the growing number of children affected with autism in Malaysia, it is important that teachers understand the characteristics of autism and the pedagogical techniques to better engage students with autism in classroom teaching and learning (Low, Lee, & Che Ahmad, 2020; Teo, Lau & Then, 2020). Several theories have been put forward to explain that students with autism process information differently from others due to their neurological differences (Delli, Varveris, & Geronta, 2017). For example, Central Coherence Theory provided the theoretical perspective to explain the specific perceptual-cognitive style in students with autism (Engel & Ehri, 2021). According to this theory, students with autism would experience difficulties to process the content information delivered by the teachers in the classroom because they exhibit a detail-focused cognitive style of processing information that often causes them to overlook connections, which is manifested as a difficulty to "see the big picture" (Engel & Ehri, 2021). Given that, it is important that teachers understand the neurological information processing differences experienced by students with autism. With this knowledge, they can use suitable teaching tools, such as concrete materials, mind-mapping tools, and other visual teaching aids in their lessons to help students with autism to make connections of the information they learnt.

At the same time, Theory of Mind provided the theoretical foundation to explain the lacking of cognitive capacity of students with autism to infer the mental states of others, which is one of the main underlying causes linking to their poor social communicative skills (Lecheler et al., 2021). Therefore, it is important that the teachers are aware of the unique psychosocial characteristics of students with autism and the associated challenges that students with autism face due to their reduced social communicative abilities. To support students with autism in inclusive settings, teachers can use language stimulation strategies and peer-mediating techniques to assist them to communicate and interact more effectively with others. However, amassing research pointed to a critical lacking of knowledge and skills to teach students with autism among teachers in Malaysia, including both the general and special education teachers (Low, Lee, & Che Ahmad, 2020; Teo, Lau & Then, 2020; Loi & Mohd Yasin, 2017).

Pictorial Narrative Approach as a Teacher Training Method

Given the context as described above, the provision of specialised teacher training on the topic of autism is important to empower teachers to teach students with autism in inclusive classrooms (Loe, Lee, & Che Ahamd, 2018). Indeed, such initiative should start as early as in pre-service training (Sharma & Rangarajan, 2019). However, many existing teacher training courses only briefly include the basic characteristics of students with autism in the course, without adequate focus on effective teaching strategies to support students with autism in schools (Blackwell et al., 2017). In regards to this, more information about effective teaching strategies to support students with autism should be incorporated in teacher training courses, including the process, procedures, and practices for effective inclusion (Busby et al., 2012).

Driven by this objective, the application of a pictorial narrative method for the purpose of teacher training on the topic of autism was designed and developed (Low et al., 2021). The application of a pictorial narrative method was inspired by the commonplace of utilizing pictorial communication in the field of medical and health sciences to improve health literacy among the general public (Brewer et al., 2016) and the minority community (Thunberg et al., 2019). Many health practitioners disseminate health-related information in pictorial forms to help the general public to understand medical terminologies and treatment

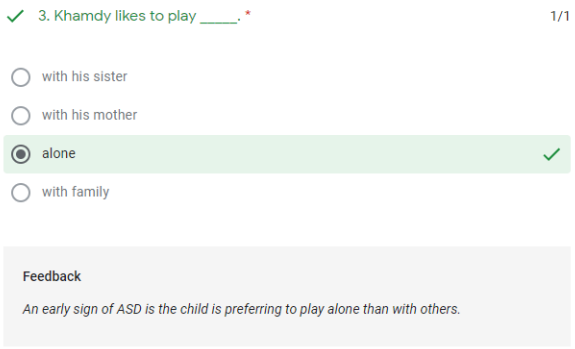
recommendations, such as information related to diabetes treatment, depression, smoking effects, and the importance of vaccination (Kaur, 2019). In addition to pictorial communication, Muturi (2016) argued that using "narratives" or 'story-telling' is a meaningful and effective way to engage a local community with concepts and practices that are foreign to them, as story-telling is the traditional method of knowledge dissemination from generations to generations. Incorporating picture communication and narrative methods, a teacher training module on the topic of autism called The Story of Khamdy® was designed and developed.

The Story of Khamdy®

The Story of Khamdy®, was created through the co-construction of knowledge (Abma et al., 2017) involving team members who have expertise in the area of autism and inclusive teaching practices (Low et al., 2021). The module was delivered via colourful pictures with an easy-to-understand script. There are 20 topics in this module. Each topic is linked in a cause–effect fashion, featuring a boy with autism called Khamdy, his family, teachers, and friends in school, encountering different challenges associated with autism symptoms and how they proactively seek and solve the problems based on evidence-based solutions. The module was made available on two online platforms, namely Facebook (https://www.facebook.com/groups/965835180415612/learning_content) and Open learning (https://www.openlearning.com/courses/autism-spectrum-disorder/) The module consisted of 20 units. Each unit contained a narrative in the format of MP4 video (refer to Figure 1). After viewing the video, the module learners have to perform two sets of reflective learning activities (I.e., quizzes and problem-solving questions) for the purpose of learning monitoring and reinforcement (refer to Figure 2).

Figure 1: Example of pictorial narrative in the module

Figure 2: Examples of reflective learning activities in the module



Aim

This study aims to measure knowledge and stigma changes in a sample of pre-service teachers who have received an online teacher training using The Story of Khamdy® module.

(1) Any significant changes in the knowledge scores before and after the training?
(2) Any significant changes in the stigma scores before and after the training?
(3) Any significant correlations between the knowledge and stigma change scores?

METHODS

Participants

Two cohorts of pre-service teachers in a teacher training program in Malaysia participated in the online training using The Story of Khamdy® module. There were 46 pre-service teachers in 2019 cohort; and 45 pre-service teachers in 2020 cohort, producing a total of 91 pre-service teachers who had completed this online learning. As shown in Table 1, 98.9% of the pre-service teachers (n = 90) were in Year 3 of their study at the time of completing this online module, 83.5% of them were female (n = 76), and 98.9% of them were below 30 years old (n = 90). It was worth noticing that there were only 12.1% of the pre-service teachers with prior teaching experience (n = 12). Amongst these pre-service teachers, 72.5% of them reportedly having had prior knowledge about autism (n = 6) and 62.6% of them reportedly having had skills to teach students with autism (n = 57).

Table 1: Demographic profile of module learners

		n	***Percent***
Cohort	2019	46	50.5%
	2020	45	49.5%
Year of study	Year 2	1	1.1%
	Year 3	90	98.9%
Gender	Male	15	16.5%
	Female	76	83.5%
Age	20-29 years old	90	98.9%
	30-39 years old	1	1.1%

Prior teaching experience	Yes	11	12.1%
	No	80	87.9%
Prior knowledge of autism	Yes	66	72.5%
	No	4	4.4%
	Not Sure	21	23.1%
Having skills to teach students with autism	Yes	57	62.6%
	No	34	37.4%

Procedures

For both cohorts of pre-service teachers, they were given the written instructions to participate in the online learning and a period of 8 weeks to complete 20 units of the module. Before they started the online training, the pre-service teachers were given an online questionnaire to fill in. This online questionnaire - Autism Stigma and Knowledge Questionnaire (ASK-Q) was originally developed by Harrison et al. (2017) and it was used to measure the pre-service teachers' knowledge and stigma levels in this study. Within 1 week after they completed the 20-unit module, the pre-service teachers were given the same online questionnaire to fill in again. The pre-training and post-training ASK-Q scores were analysed and compared to determine the knowledge and stigma changes.

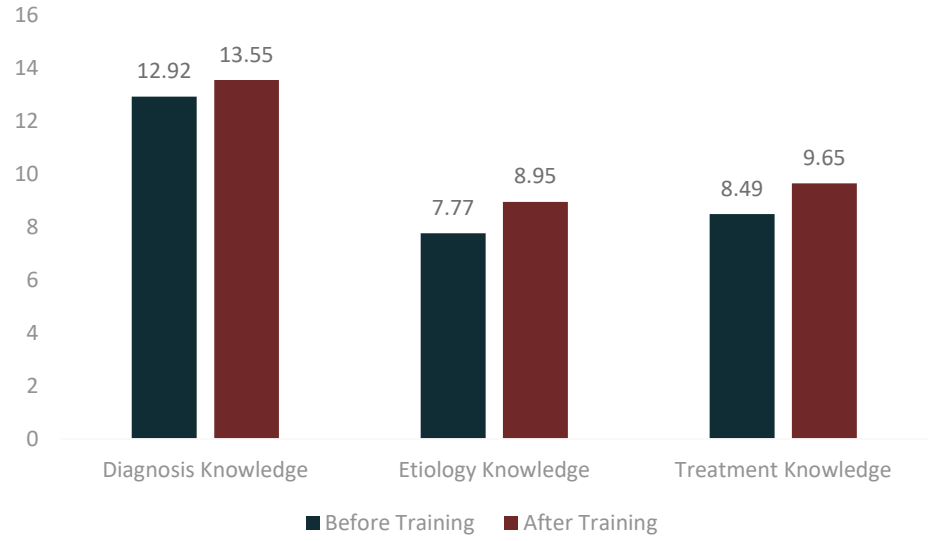
Instrument

Autism Stigma and Knowledge Questionnaire, ASK-Q contained 49 questions related to autism knowldge and stigma. The permission to use ASK-Q for this study was obtained from the developers prior to the study. Three specific knowledge domains related to autism were assessed in ASK-Q, namely diagnosis knowledge (18 items), etiology knowledge (16 items), and treatment knowledge (14 items). Besides that, ASK-Q also contained a general question about ASD knowledge (i.e., "I have prior knowledge of autism"). Harrison et al. (2017) additionally identified 7 items from these 49 items as reflecting autism-related stigma (e.g., "Autism happens mostly in middle-class families"). Paired-sample t-tests were used to compare the changes in knowledge and stigma scores before and after the online training. Pearson correlations were computed to analyse the relationships between the knowledge and stigma change scores, as the effect of the online training.

RESULTS

To determine the changes of knowledge scores before and after the training, the pre-training and post-training ASK-Q scores for the knowledge domains of diagnosis (18 items), etiology (16 items) and treatment (14 items) were analysed. Higher knowledge scores were observed for all the knowledge domains after the training (refer to Figure 3). Results of paired-sample t-tests revealed statistically significant changes in scores for etiology knowledge (t = 2.072, p = .042) and treatment knowledge (t = 3.911, p = .000), but not for the diagnosis knowledge (t = 1.379, p = .173).

Figure 3: ASD knowledge before and after the training



Next, to determine the changes of stigma scores before and after the training, the pre-training and post-training ASK-Q scores for the stigma-endorsement items were analysed. For this analysis, higher scores indicated less endorsement of stigma (Harrison et al., 2017). The mean score of stigma before the training was 2.37 (*SD* = 1.518), while the mean score of stigma after the training was 3.58 (*SD* = 1.357). Result of paired-sample t-test revealed statistically significant less endorsement of stigma,*t* = 5.483, *p* = .000 after the training (refer to Figure 4).

Figure 4: Non-endorsement of Stigma before and after the training

Lastly, the relationships the knowledge and stigma change scores associated with the training were analysed. The change scores were obtained by computing the differences between the scores before (D_1, E_1, T_1, S_1) and after the training (D_2, E_2, T_2, S_2) for each knowledge and stigma domain. The findings pointed to positive correlations among all the change scores (refer to Table 2). Specifically, etiology and

treatment change scores were found to have strong positive correlations with stigma change scores, $r = .723$ and $r = 533$, $p < .01$; while the sub-variable of diagnosis change score was found to have a weaker positive correlation with with stigma change scores, $r = .289$, $p < .01$.

Table 2: Correlations of knowledge and stigma change scores

	Diagnosis Knowledge change scores (D_2 - D_1)	**Etiology Knowledge change scores (E_2 - E_1)**	**Treatment Knowledge change scores (T_2 - T_1)**	**Stigma change scores (S_2 - S_1)**
Diagnosis Knowledge change scores (D_2 - D_1)		.342*	.471**	.289*
Etiology Knowledge change scores (E_2 - E_1)			.396*	.723**
Treatment Knowledge change scores (T_2 - T_1)				.533**

*$p < .05$ (2-tailed), ** $p < .01$ (2-tailed)

DISCUSSION

This study aims to measure knowledge and stigma changes in a sample of pre-service teachers who have received an online training using The Story of Khamdy® module. The uniqueness of this online module was the incorporation of a pictorial narrative approach in its design and development (Low et al., 2021). The content of the module was delivered using 200 illustrations, which were presented sequentially for a systematic learning on the topics of identifying autism, early diagnosis and intervention, disputing the myths of autism, family and inclusion support, social communication strategies, differential instructions, preventing of bullying, and transition to puberty and adulthood (Low et al., 2021).

Three autism knowledge domains were measured in this study, namely diagnosis, etiology and treatment knowledge. First of all, despite that an increase of knowledge score was observed for diagnosis knowledge, the score changes were not statistically significant. This finding is noteworthy as it implies that in general, the pre-service teachers have high diagnosis knowledge about autism, even before participating in the online training. This finding corresponded with the view put forward by Blackwell et al. (2017) that many existing teacher training courses contained information related to the basic characteristics of students with autism in the course. Hence, it can be inferred that the pre-service teachers in this study have acquired diagnosis knowledge about autism (I.e., signs and characteristics of autism) from the teacher training program, or from autism awareness initiatives in the community. Past studies with pre-service teachers in the special education program in Malaysia provided insights that these pre-service teachers do have basic knowledge about autism (Low, Lee, & Che Ahmad, 2018b) and they also have more positive attitude about autism as compared to their peers in non-special education teacher training programs (Low, Lee & Che Ahmad, 2018a).

On the other hand, subsequent analyses of the ASK-Q scores indicated that significant changes in etiology and treatment knowledge scores were recorded. This set of findings offered evidence to support

the efficacy of this pictorial narrative online training method to improve the knowledge of the pre-service teachers in the aspects of etiology knowledge and treatment knowledge. This set of findings is noteworthy as it offers the perspective that this pictorial narrative online training module has successfully expand the current paradigm of teacher training on the topic of autism, which for many years, is only limited to the basic knowledge about autism characteristics (Busby et al., 2012). The findings provided evidence that this pictorial narrative online training module has recorded success in imparting etiology and treatment knowledge to the pre-service teachers in this study. Given this new knowledge, it is hoped that the pre-service teachers can acquire more practically relevant pedagogical knowledge, which is beyond a mere understanding of autism characteristics, to improve their self-efficacy and confidence in teaching students with autism in schools (Vincent & Ralston, 2020).

Last but not least, the findings pointed to a statistically significant reduction in autism-related stigma after the online training. Past researchers had vastly reported a closed relationship between low knowledge and stigmatization of autism, and such relationship is especially prominent in low-resource communities (Sheehy, Kaye, & Rofiaha, 2020). The final set of findings from this study add evidence that improvement in autism knowledge and reduction in autism-related stigma are closely associated. In particular, the positive associations between the etiology knowledge, treatment knowledge and stigma changes scores are notably strong. This finding points to the importance of imparting etiology and treatment knowledge about autism in reducing stigma about autism amongst pre-service teachers who would be teaching students with autism in the future.

CONCLUSION

In conclusion, statistically significant knowledge gain and stigma reduction were recorded among 91 pre-service teachers who had completed an online teacher training module on the topic of autism, which incorporated pictorial narrative method in the module design. As a whole, the findings pointed to the efficacy of this module to better prepare pre-service teachers to teach students with autism.

ACKNOWLEDGEMENT

This paper is an output of the project supported by Research University Individual Grant (8016085).

REFERENCES

Abma, T. A., Cook, T., Rämgård, M., Kleba, E., Harris, J., & Wallerstein, N. (2017). Social impact of participatory health research: Collaborative non-linear processes of knowledge mobilization. *Educational Action Research, 25(*4), 489–505.

Blackwell Ph D, W. H., Sheppard, M. E., Lehr, D., & Huang, S. (2017). Examining pre-service teacher candidates' sources and levels of knowledge about autism spectrum disorders. *Journal of Human Services: Training, Research, and Practice*, *2*(2), 1-25.

Brewer, N. T., Hall, M. G., Noar, S. M., Parada, H., Stein-Seroussi, A., Bach, L. E., ... & Ribisl, K. M. (2016). Effect of pictorial cigarette pack warnings on changes in smoking behavior: a randomized clinical trial. *JAMA internal medicine*, *176*(7), 905-912.

Busby, R., Ingram, R., Bowron, R., Oliver, J., & Lyons, B. (2012). Teaching Elementary Children with Autism: Addressing Teacher Challenges and Preparation Needs. *Rural educator*, *33*(2), 27-35.

Delli, C. K. S., Varveris, A., & Geronta, A. (2017). Application of the Theory of Mind, Theory of Executive Functions and Weak Central Coherence Theory to Individuals with ASD. *Journal of Educational and Developmental Psychology*, *7*(1), 102-102.

Dimian, A. F., Symons, F. J., & Wolff, J. J. (2021). Delay to early intensive behavioral intervention and educational outcomes for a Medicaid-enrolled cohort of children with autism. *Journal of Autism and Developmental Disorders*, *51*(4), 1054-1066.

Engel, K. S., & Ehri, L. C. (2021). Reading Comprehension Instruction for Young students with autism: Forming Contextual Connections. *Journal of Autism and Developmental Disorders*, *51*(4), 1266-1280.

Fuller, E. A., & Kaiser, A. P. (2019). The effects of early intervention on social communication outcomes for children with autism spectrum disorder: A meta-analysis. *Journal of Autism and Developmental Disorders*, 1-18.

Harrison, A. J., Bradshaw, L. P., Naqvi, N. C., Paff, M. L., & Campbell, J. M. (2017). Development and psychometric evaluation of the autism stigma and knowledge questionnaire (ASK-Q). *Journal of Autism and Developmental Disorders*, 47(10), 3281–3295

Hodges, H., Fealko, C., & Soares, N. (2020). Autism spectrum disorder: definition, epidemiology, causes, and clinical evaluation. *Translational Pediatrics*, *9*(Suppl 1), S55-S65.

Jick, H., & Kaye, J. A. (2003). Epidemiology and possible causes of autism. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*, *23*(12), 1524-1530.

Kaur, N. (2019). Impact of photonovel interventions among people with low levels of health literacy: A literature review. *Education for Information*, *35*(1), 21–34.

Lecheler, M., Lasser, J., Vaughan, P. W., Leal, J., Ordetx, K., & Bischofberger, M. (2021). A matter of perspective: An exploratory study of a theory of mind autism intervention for adolescents. *Psychological Reports*, *124*(1), 39-53.

Loi, S. W. & Mohd Yasin, M. H. (2017). Teacher Training to Increase Teacher's Competency in Teaching Autism Child. *Journal of ICSAR*, *1*(1), 1-5.

Low, H. M. (2019). The Story of Khamdy®. https://www.facebook.com/groups/965835180415612/learning_content

Low, H. M., Lee, L. W., & Che Ahmad, A. (2018a). Pre-service teachers' attitude towards inclusive education for students with autism Spectrum Disorder in Malaysia. *International Journal of Inclusive Education*, *22*(3), 235-251.

Low, H. M., Lee, L. W., & Che Ahmad, A. (2018b). Preparing special education pre-service teachers to address the speech, language and communication needs of students with ASD: a needs assessment. *Speech, Language and Hearing*, *21*(3), 142-151.

Low, H. M., Lee, L. W., & Che Ahmad, A. (2020). Knowledge and Attitudes of Special Education Teachers Towards the Inclusion of students with autism Spectrum Disorder. *International Journal of Disability, Development and Education*, *67*(5), 497-514.

Low, H. M., Wong, T. P., Lee, L. W., Makesavanh, S., Vongsouangtham, B., Phannalath, V., ... & Lee, A. S. S. (2021). Can pictorial narration offer a solution to teacher training on the effective inclusion of students with autism spectrum disorder in low-resource settings? Investigation on knowledge and stigma change. *Autism*, 1362361320984899.

Muturi, N. (2016). Community perspectives on communication strategies for alcohol abuse prevention in rural central Kenya. *Journal of Health Communication*, *21*(3), 309–317.

Nahmias, A. S., Pellecchia, M., Stahmer, A. C., & Mandell, D. S. (2019). Effectiveness of community-based early intervention for children with autism spectrum disorder: a meta-analysis. *Journal of Child Psychology and Psychiatry*, *60*(11), 1200-1209.

NASOM (2021). Autism. https://www.nasom.org.my/autism/

Ozonoff, S., Young, G. S., Brian, J., Charman, T., Shephard, E., Solish, A., & Zwaigenbaum, L. (2018). Diagnosis of autism spectrum disorder after age 5 in children evaluated longitudinally since infancy. *Journal of the American Academy of Child & Adolescent Psychiatry*, *57*(11), 849-857.

Rattaz, C., Michelon, C., Munir, K., & Baghdadli, A. (2018). Challenging behaviours at early adulthood in autism spectrum disorders: topography, risk factors and evolution. *Journal of Intellectual Disability Research*, *62*(7), 637-649.

Sharma, U., & Rangarajan, R. (2019). Teaching students with autism spectrum disorders in South Asia: a scoping study and recommendations for future. *International Journal of Developmental Disabilities*, *65*(5), 347-358.

Sheehy, K., Kaye, H., & Rofiaha, K. (2020). Indonesian educators' knowledge and beliefs about teaching children with autism. *Athens Journal of Education*, *7*(1), 77-98.

Teo, J. X., Lau, B. T., & Then, P. (2020). Autism Spectrum Disorders in Sarawak: An Overview and Analysis of Educator Awareness, Training, Development Opportunities, and Challenges. *International Journal of Disability, Development and Education*, 1-17.

Thunberg, G., Ferm, U., Blom, Å., Karlsson, M., & Nilsson, S. (2019). Implementation of pictorial support for communication with people who have been forced to flee: Experiences from neonatal care. *Journal of Child Health Care*, *23*(2), 311-336.

Vincent, J., & Ralston, K. (2020). Trainee teachers' knowledge of autism: implications for understanding and inclusive practice. *Oxford Review of Education*, *46*(2), 202-221.