

Development of Teaching Aids M-Table for Slow Learner (Learning Disabilities) In Furniture Manufacturing Basics Subject

Mohamed Nor Azhari Azman^{a*}, Muhammad Norfadhli Mohd Arif^b, Moh Khairudin^c, Ibnu Siswanto^d, ^{a,b}Faculty of Technical and Vocational, Universiti Pendidikan Sultan Idris, 35900, Tanjung Malim Perak, MALAYSIA, ^{c,d}Faculty of Engineering, Universitas Negeri Yogyakarta, Jl. Colombo No.1, Karang Malang, 55281, Daerah Istimewa Yogyakarta, INDONESIA, Email: ^{a*}mnazhari@ftv.upsi.edu.my

Teaching aids are very important in teaching sessions at schools as they enhance the teaching delivery and to ensure the students get better a understanding of the subject matter. The purpose of this study is to assess the effectiveness teaching aids for pupils with learning disabilities. The teaching tool was developed to address some of the problems faced by teachers as well as students who have learning disabilities. This study uses a qualitative study design by using observations and interview data collection instruments. The Furniture Manufacturing Basics Curriculum is a new subject implemented in 2017 in Malaysia specifically for the Integration Special Education Program at secondary schools in Selangor state. Three (3) respondents were selected with knowledge and expertise in furniture who are also special education students to conduct semi structured interview sessions. The findings from interviews were analysed using the code determination method. The transcript was analysed from interviews shows that M-TABLE teaching aids has an effectiveness that can solve problems faced by teachers and pupils. However, some improvements to the product can make M-TABLE teaching aid a product that has value to be marketed.

Key words: *Special Education, Teaching Aid, M-TABLE, Learning Disabilities, Furniture Manufacturing Basics, Effectiveness.*

Introduction

Generally, the subjects of technical and vocational teaching are taught to students with basic skills like reading, calculate and writing. The government has recognised the importance of technical and vocational skills in today's generation by implementing various initiatives to provide TVET education to special needs students. The term "Learning disabilities" was first used by Samuel Kirk in 1962 after a meeting between parents and professionals concerned for children with learning disabilities (Richard, 2012).

In Malaysia, students with special needs have been identified as students with physical disabilities and learning disabilities. Act 550 of the Education Act states that the national education program only accepts students with special needs who can be educated and that they can manage themselves without assistance and have the ability to pursue learning and this must have been approved by medical personnel (Special Education Division, 2016). Therefore, the Special Education Division (BPKhas) under the MOE was created specifically to design and provide education programs for three types of disabilities namely hearing, visual and learning disabilities (Lokman Tahir and Nurul Qistina, 2010). In this regard, the new and specific vocational skills subjects were introduced and implemented gradually in 2017 to several schools in Malaysia aimed at producing skilled students (Special Education Secondary Curriculum Standards, 2016). This was an effort to overcome learning disabilities and possible psychological problems, giving rise to less developed speech, thinking, spelling and calculating skills (Puteri Roslina Abdul Wahid and Nur Azimah Bukhari, 2016).

However, referring to the Ministry of Education Malaysia, special needs students are those who have some or all of the visual or hearing impairments or learning disabilities (Anizam et al., 2013). Other than that, recent studies have showed the finding from Ramlee and Noraini (2007) that Curriculum during the Secondary Education Learning (LD) education in Malaysia has many disadvantages as it does not focus on providing students with vocational skills. Education for learning disabilities (LD) is still low and is no longer relevant to the current job market. Noraini et al. (2005) also argued similarly and encouraged the education system reviewed in favour of such groups. Hence, there is a need for special education students to be categorised into, for example, type 1 for is visual impairment (Low vision or blindness), type 2 for those with hearing and speech problems (High, Mild and Low), and type 3 for students with learning disabilities such as down syndrome, autism, dyslexia, slow learner, hyperactive, cleft lip palate, russell syndrome, epilepsy and mental retarded (Ministry of Education, 2016). These children need specialised education and services to develop their potential and self-development (Sofi et al., 2010). Learning Disabilities Students typically have one or more disabilities whether physical or behavioural, which are cognitively related to motor and social skills (Masitah and Suhaida, 2010).

The use of educational resources by students and teachers in teaching and learning is less encouraging because of a shortage of physical facilities, educational resources, trained manpower, weakness in the management of school resource centres, attitudes and interests of teachers. Therefore, with the use of teaching aids for special needs students, it is possible to facilitate target groups who are having trouble learning the basics of furniture making. In addition, this study is about discovering the importance of teaching aids as an innovative method of teaching aids in schools. Teaching aids are used and implemented by teachers to create a constructive teaching and learning environment (Helen Bourke Taylor et al., 2018; Fiona et al., 2018). These kits are prepared based on the psychological aspects of children and according to their abilities and different skills. This is in line with the mission of the technical and vocational education division as the leading technical and vocational education leader. This approach is more creative and innovative and includes strategy, structure and culture across the school.

Zainuddin et al. (2009) stated that an aspect of interest can also be considered as a driving force for attention for a thing or an activity. In the context of teaching for students with learning disabilities, it is more important to prioritise the skills that will help them in the future. Basic facilities that include workshops, cooking rooms and specific rooms as well as appropriate teaching aids can ensure the teaching and learning process is effective.

Traditional teaching is a passive teaching method and cannot effectively motivate students. This learning method can cause the students to become bored because all the information is available and the students don't need to ask what they are learning.

Therefore, the quality of a student-centered learning depends on the effectiveness of the teacher and the use of appropriate teaching aids. If teachers are not able to use teaching aids effectively, their learning will not be successful. The effectiveness of teaching aids is not only determined by its quality but also by its technique (Rashidi Azizan and Abdul Razak, 1996). When engaging students with learning difficulties they need to be given special attention. The basic topic of furniture making is one of the new subjects implemented in 2017 under the special education secondary curriculum where students learn skills from a number of other subtopics at secondary school. Researchers have found that the most commonly used materials are impressions videos of teaching and learning in the classroom.

The lack of a conducive teaching environment and limited teaching aids have made special education students less interested in the teaching sessions presented (Hanafi et al., 2010). The purpose of this study is to develop a set of teaching aids for the topic of furniture making Basics. The development of the teaching aids is an adaptation from mortise concept which has been used in furniture making. Nowadays, the development of technology has changed, so it is also includes mortise joint through furniture making (Azman et al., 2014). Therefore,

the purpose of the study was to identify the basic teaching requirements for furniture making for special secondary schools, to develop a teaching tool for basic M-TABLE furniture making and to test the uses of M-TABLE modules by students with learning disabilities for the Furniture Manufacturing Basics.

The results of past research show that the teaching and learning activities are closely related to the uses of teaching aids, the appropriate curriculum and the skills of the special education teachers who teach the skill based subject.

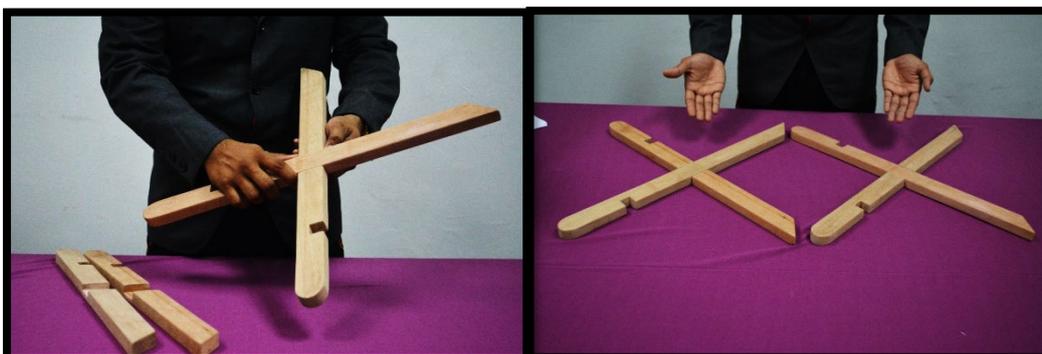
Development of Teaching Aids M-Table

This module was developed based on the adaptation of the ADDIE Model by Rosset in 1989. This module explains the steps that need to be taken to develop a cooperative learning module. Based on the ADDIE model, the development of this module consists of five (5) phases, namely the analysis phase requirements, design phase, development phase, implementation phase and the evaluation phase (Johari et al., 2007). Figure 1-6 presents the steps for assembling the components of the M-Table teaching aids. Figure 1 shows that the parts of the wood label should be arranged according to the numbers on the same section. Next, Figure 2 illustrates the installation of the components according to the section label to create the joint of cross bar attack.

Figure 1. Step One (Organizing)



Figure 2. Step Two (Inclusion)



Then assemble the crossing leg of the Table, to be the foundation of the M-Table as presented in Figure 3. Next, assemble the frame of the top M-Table as shown in Figure 4. Then, put the plywood sheets on top of the finished frame of M-Table as presented in Table 5. Finally, place the table surface on the table foot surface as illustrated in Figure 6. This module provides an interactive learning opportunity for slow learners to help students to understand the basic subject matter of furniture making.

Figure 3. Step Three (Inclusion)

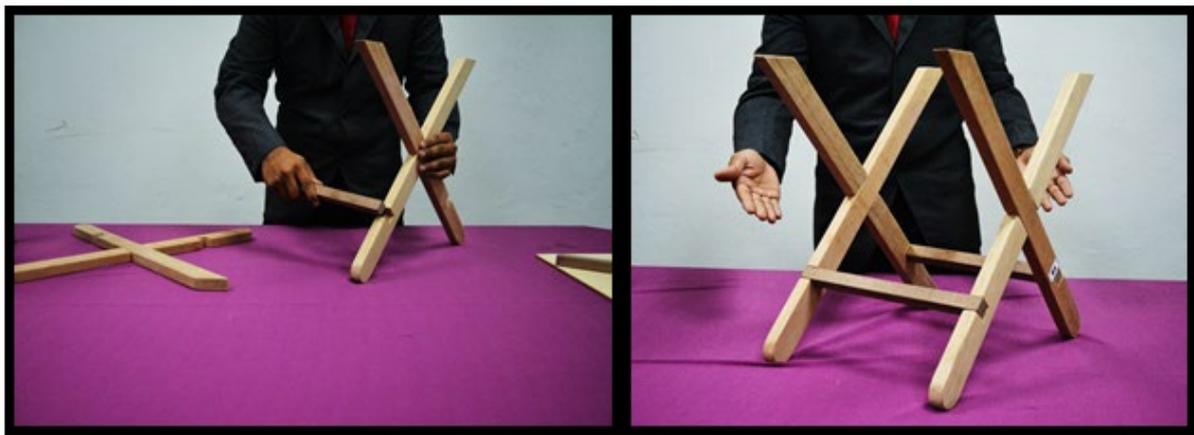


Figure 4. Step Four (Framing Merge)

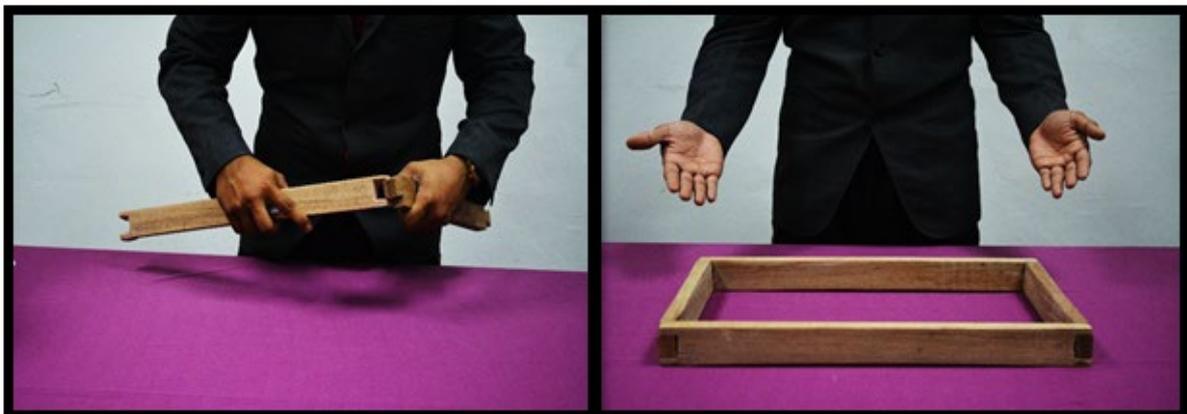


Figure 5. Fifth Step (Merging of Table Surfaces)



Figure 6. Sixth Step (Merger)



Methodology

Research Design

This study is a qualitative research that has its own form of data that is different from quantitative research (Jasmi, 2012). This study used a qualitative approach using semi-structured interview instruments and observations (Jasmi, 2012). The semi-structured interviews were validated by the consultants, and the design of this study was chosen to obtain specific information. The data obtained from the interviews will be analysed using code determination (Flick, 2004)

Patton's (1990) opinion stated that interviews are conducted when researchers want to know what is in one's mind. Through the interview method, we can collect data from the feedback

of the "M-TABLE" teaching aids and it can be used to better special education secondary schools.

Research Location

This study was conducted in the state of Selangor and involved only one secondary school that offered the furniture manufacturing basics curriculum, which is a new subject implemented for Integration Special Education Program on 2017.

Research sample

This study was a small-scale study involving only 15 samples of students with special needs (learning disabilities) and 3 subject matter experts for the purpose of interviewing the teaching aids developed. The size of the sample chosen was based on the method of sampling (Chua Yan Piaw, 2006). The selection of experts is based on the experience of teaching special education beyond 10 years (Saedah et al., 2008).

Research instrument

The instruments used in this study were observation methods and semi-structured interviews (Patton 1990; Flick 2004; Jasmi 2012) because the sample consists of students with special needs.

Method of Data Analysis

After the development of the M-Table teaching aids was completed, the researchers interviewed three respondents at a national secondary school in Selangor. This interview was conducted to get the teacher's response to the ready-made M-Table product. Next, the researcher analysed of the information obtained. Data analysis is the final step in the methodology. All the data obtained was typed and coded to enable the researcher to analyse the information from the results of the interview for validity. The application of this method is called content analysis. According to Flick (2004), content analysis is a comprehensive discussion of the content of this written or printed information in mass media. Content analysis method allow the researcher to draw conclusions from the results of the interviews.

Findings

The findings of this study refer to the code analysis performed to obtain the themes based on statements provided by the panel of experts.

Interview Transcript

This interview was conducted at the national secondary school in Selangor. Three similar questions related to M-Table Fuel were asked to all respondents. The following questions were asked to the respondents: -

1. Can you explain your academic background and work experience?
2. Is this product suitable for teaching aids in the Furniture Manufacturing Basics?
3. In your opinion, what improvements need to be made to M-Table teaching aids?

Code Determination

The determination of this code was created as a facilitator for researchers to analyse data as a result of interviews conducted. This was based on the transcript of three (3) respondents as shown in Table 2. Table 3 presents the panel of experts consisted of lecturers in special education and all of them have more than 10 years' experience in their respective fields. Table 4 illustrates the agreement with all respondent that the M-Table can be used as teaching aids and can be further used for commercialisation. Figure 5 shows the code specifications for each of the questions asked by the respondents.

Table 2: Respondents Response Interview Transcript on M-TABLE

	RESPONSE ANSWER
Q1	Can you tell us about your academic background and working experience?
R1	At first I was assigned the Shah Alam Vocational Special Education Secondary School for 13 years there, with a wide range of skills such as automotive, furniture and air conditioning and more. Then I went to school in slavery for 13 years, Selangor for 4 years. After that I was appointed assistant director of special education but only for a few months, due to my deteriorating health and after my health improved I assumed the position of senior assistant special education at Secondary school and coincidentally a new senior assistant retired and now I teach as a Level 2 student, I had always thought of quitting and changing my field but due to my high sense of responsibility I continued to educate this special student.
R2	I work at secondary school and teach students special needs. My expertise is in furniture, as I have my own carpentry premises. My job at Secondary school is as a PPKI teacher and co-curriculum coordinator.
R3	I was also assigned to secondary school as a PPKI teacher and I was a state level special education furniture unit. Where I am in charge of the special education curriculum, for the subject of the first level of Furniture Manufacturers just introduced in 2017 and for the 2nd level of furniture making will be introduced in

	2018.
Q2	Is this product suitable for school teaching aids on the subject of furniture making?
R1	For me to get involved in such activities is very appropriate for my kids. Because I see the product very neatly as if you were sending it to the store to produce this item. Another student wants to do it and I see it and I think this teaching aids would be great to apply to a special education student.
R2	Well, for the glasses of a furniture teacher I see this as a very good alternative. It is a design that students with special education can understand. Another dangerous tool can be reduced.
R3	For me it fits perfectly. This is because indirectly it tells the students about the actual function of the brain. In addition, this teaching aids can save teachers time in R&D in the workshop. Because teachers don't have to do a lot of demos for students. I think in terms of time spent in the classroom, it can be overcome, because there is already fuel that has a way of building a house and functioning of technology. In terms of the type of furniture that is laid out, it is appropriate to focus on product development for furniture. This product has its own value.
Q3	In your opinion, what improvements need to be made to M-Table teaching aids?
R1	In my opinion you need to find the best way for the top of the Table, or you can decorate the top to make it look more attractive.
R2	In my opinion a furniture teacher I find teaching aids really good but I have a goal to equip my students with furniture that uses fasteners other than foam, as I see as a carpenter this is a slow method and you need to emphasize the quality of the product. But what you do is really good.
R3	I find this to be very good and follow the curriculum, but I think you need to emphasize the top of the Table. You can use Softwood, MDF, and Rubber Wood. if you use another fastener I feel better.

Table 3: Respondent Profile (Question 1)

RESPONDENT	AGE	ROLE	EXPERIENCE
R1	50 Years	Senior Assistant Special Education Intergration	24 Years
R2	33 Years	Curriculum Coordinator / Teacher PPKI Furniture / Carpenter	10 Years
R3	34 Years	Furniture PPKI Teacher /State Special Education Committee	10 Years

Table 4: Determination of Code for Question 2: Can you explain your academic background and working experience?

No.	Theme	R1	R2	R3
1	Ideal for make as teaching aids	1	1	1
2	Not ideal for teaching aids			
3	Commercialization	1	1	1
4	Not suitable for commercialization			

Table 5: Determination of Code For Question 3: In your opinion, what improvements should be made to M-TABLE?

No.	Aspect	R1	R2	R3
1	Design	1	1	1
2	Size	1	1	1
3	Weight	1	1	1
4	Table Surface	1	1	
5	Variety Of Colour	1		1
6	Variety Of Dovetail Shape	1	1	
7	Finishing	1	1	
8	Other Material	1		
9	Type Of Wood	1		1
10	Safety Factor	1	1	1
11	Multifunction	1	1	1

Figure 7 shows that all respondents stated the durability, table surface and product colour diversity needed to be improved. As for the third question regarding product improvement, the M-TABLE still needs to be improved in order to achieve the objectives it has created.

Figure 7. Response Code Analysis for Second Question

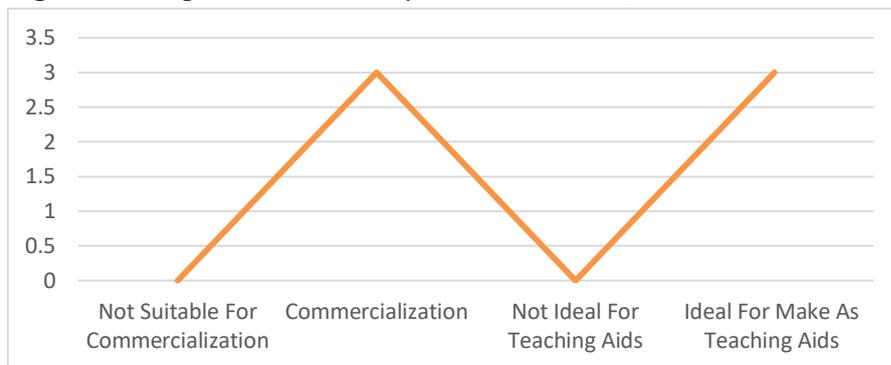
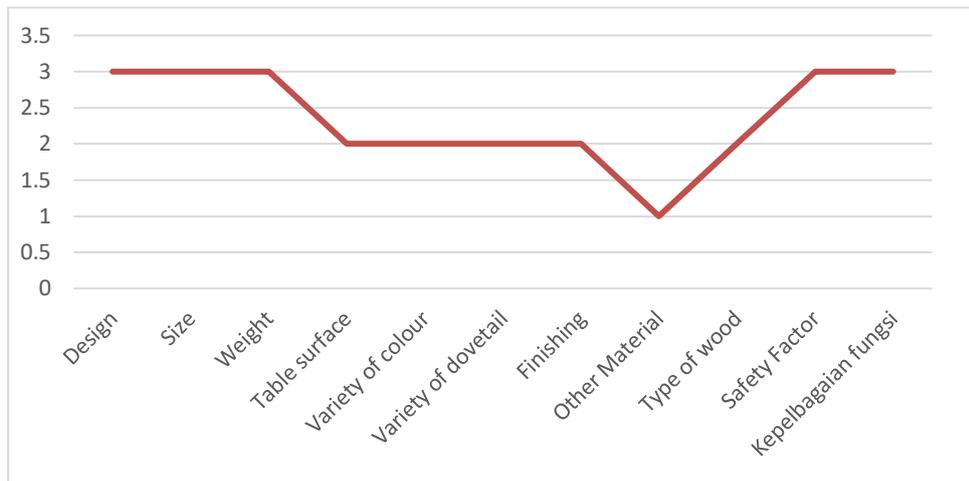


Figure 8. Response Code Analysis for Third Question



Discussion

Overall, this study demonstrates that the M-Table is intended to assist teachers in delivering the content of the lessons stated in the curriculum standard document and the assessment of the subject matter of basic vocational skills in furniture making. The first research question that has been analysed to make improvements to the study is what the student's skill level before and after using teaching aids. Semi-structured interviews were conducted for three respondents with different academic backgrounds and experiences (Patton 1990; Flick 2004; Jasmi 2012). Through the tests and interviews researcher found that all the students were of different levels. Explanations and demonstrations were shown to the students first and then the pupils attempted the activities using the module given and under the teacher's instructions. Here we can see that the skills and academics of special education students are very different. The enthusiasm shown during the first time use of the teaching aids made the same students want to try again.

Therefore, the findings of this study show that special education teachers are satisfied with the planning and development of the teaching aids that help students with learning disabilities. These students have different levels of functionality in teaching and learning sessions (Helen Bourke Taylor et al., 2018; Fiona et al., 2018). Recent studies on teaching aids have shown the importance in providing the best exposure and understanding for students, especially special needs students.



Conclusion

Through the research conducted, the findings of the study aimed at addressing the research questions, namely what are the students' skills levels before and after using teaching aids in teaching and learning in schools and what does the M-TABLE to provide students with learning difficulties? With comprehensive and clear teaching aids, teachers can implement this product during the teaching and learning process. This product can allow students to create their own experience with the M-TABLE installation. Thus, 21st century learning activities and student-centered learning can be implemented in classrooms.

REFERENCE

- Ahmad Johari, S., Mohd Ali, I. & Zulkiflie, A. W. (2007). *Pembinaan Perisian Multimedia Pendidikan Berasaskan Model Konstruktivisme Kitaran Pembelajaran Sains Lima Fasa*. Fakulti pendidikan, Universiti Teknologi Malaysia.
- Anizam, M. Y., Manisah, M. A. & Amla, M. S. (2013). Pendidikan Vokasional Pelajar Berkeperluan Khas Ke Arah Memenuhi Pasaran Pekerjaan. *Proceeding of the International Conference on Social Science Research, ICSSR 2013*. 4-5 June 2013, Penang, MALAYSIA. e-ISBN 978-967-11768-1-8.
- Azman, M.N.A., Nor Hafizah, M. I., Ahmad Mohamad, S. & Ramlee, M. (2014). Mini Meja Tanggam (MMT). *Jurnal Teknologi (Sciences & Engineering)*.72:1 (2015) 13–20, Universiti Teknologi Malaysia.
- Bahagian Pembangunan Kurikulum. (2016). *Buku penerangan kurikulum standard sekolah menengah*. Kementerian Pendidikan Malaysia.
- Bourke-Taylor, H., Cotter, C., Johnson, L., & Lator, A. (2018). *Belonging, school support and communication: Essential aspects of school success for students with cerebral palsy in mainstream schools*. *Teaching and Teacher Education*, 70, 153–164. doi:10.1016/j.tate.2017.11.016
- Bourke-Taylor, H., O'Shea, R., & Gaebler-Spira, D. J. (2007). Conductive education: A functional skills program for children with cerebral palsy. *Physical and Occupational Therapy in Pediatrics*, 27(1), 45–62. https://doi.org/10.1300/J006v27n01_04
- Fiona Beauchamp, Helen Bourke-Taylor & Ted Brown (2018): Therapists' perspectives: supporting children to use switches and technology for accessing their environment, leisure, and communication, *Journal of Occupational Therapy, Schools, & Early Intervention*, DOI: 10.1080/19411243.2018.1432443
- Hanafi, Y., Hasnah, T., Mokhtar, T. & Safani, B. (2010). Teacher's Perspective On Infrastructure Of Special Education's Classroom In Malaysia. *Procedia Social and Behavioral Sciences*, 9, 291–294
- Jasmi, K. A. (2012). Metodologi Pengumpulan Data dalam Penyelidikan Kualitatif. *Kursus Penyelidikan Kualitatif Siri 1 2012*. Institut Pendidikan Guru Malaysia Kampus, Johor Bahru, Johor Darul Takzim.



- Lokman, T., Nurul, Q. M. (2009). Pendidikan Teknik Dan Vokasional Untuk Pelajar Berkeperluan Khas. *Jurnal Pendidik dan Pendidikan*, Jil. 24, 73–87, 2009.
- Lokman, T., Nurul, Q. M. (2010). *Faktor-Faktor Yang Mempengaruhi Keberkesanan Pendidikan Khas Teknik Dan Vokasional Untuk Golongan Orang Kurang Upaya Di Tiga Buah Politeknik*. Universiti Teknologi Malaysia.
- Masitah, H. & Suhaida, K. (2014). Kemahiran Vokasional Diperlukan Pelajar Pendidikan Khas Intergrasi Bermasalah Pembelajaran Sekolah Menengah Harian, *First Technical And Vocational Education International Seminar 2014*, (TVEIS 2014).
- Ministry of Education. (2016). *Special Education Data 2016*. Special Education Division, Ministry Of Education Malaysia.
- Norani, S., Abd. Razak, H. & Ramlee, M. (2005). Technical, vocational and IT provision and competencies of secondary and primary school students with special need in Malaysia. Projek IRPA. Bangi: Fakulti Pendidikan UKM.
- Patton, M. Q. (1990). *Qualitative Evaluation And Research Method*. London : Sage Publication.
- Puteri R., Abdul W., Nur A.B. (2016). Gaya Pembelajaran Kanak-Kanak Lembam Dalam Pembelajaran Bahasa Melayu. *Jurnal Bahasa* Jilid 16 Bil. 2.
- Ramlee M. & Norani, S. (2007). Self-fulfilling prophecy and digital divide revisited: vocational and IT competencies of special needs population in Malaysia. *Jurnal Kerja Sosial* 6(1), 33-65.
- Rashidi, A. & Abd. Razak, H. (1996). *Pengajaran Dalam Bilik Darjah: Kaedah Dan Strategi*, Masa Enterprise, Kajang.
- Richard, M. G. (2012). *Teaching In Today's Inclusive Classroom: A Universal Design For Learning Approach*. USA: Wadsworth Cengage Learning.
- Saedah Siraj (2008). *Kurikulum masa depan*. Kuala Lumpur: Penerbit Universiti Malaya.
- Siagian & Sondang P. (1994). *Adminitrasi Pembangunan*. Jakarta: PT. Bumi Aksara.
- Siti Farhana, M. R. & Mahaliza, M. (2014). Roda C.I.U : Satu Teknik Untuk Membina Kemahiran Mengecam Dan Mengingat Simbol Nombor Bulat 1 Hingga 9 Bagi Murid Lembam. *Asian Education Action Research Journal (AEARI)*, ISSN 2289-3180/VOL.3/2014.



Sofi, N., Rohana, H. & Amirmudin, U. (2010). Falsafah Pendidikan Kebangsaan Memperkasakan Peranan Pendidikan Teknik Vokasional Dan Pendidikan Khas. Edupress, Universiti Teknologi Malaysia.

Uwe Flick, Ernst, V. K. & Ines, S. (2004). *A Companion To Qualitative Research*. London : Sage Publication.

Yulinda, E. S. (2010). *Kesulitan Belajar*. Magistra No 73 Th. XXII September 2010. ISSN 0215-9511.

Zainuddin, M. I., Ramlee, M. & Noraini, S. (2009). *Kurikulum Pendidikan Vokasional Murid Bermasalah Pembelajaran (MP)*. DP. Jilid 9, Bil. 2/2009 Pendidikan khas.