THE EFFECTS OF A SCHOOL-BASED NEURODIVERSITY LITERACY PROGRAM FOR KNOWLEDGE, ATTITUDE, AND BEHAVIORAL INTENTION AMONG ADOLESCENTS: A PILOT SINGLE-ARM TRIAL

LIOW JIA LI

PET JIA YI

WONG XIO ZEN

A RESEARCH PROJECT
SUBMITTED IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE BACHELOR OF SOCIAL SCIENCE (HONS) PSYCHOLOGY
FACULTY OF ARTS AND SOCIAL SCIENCE
UNIVERSITI TUNKU ABDUL RAHMAN

NOV. 2019

The Effects of a School-Based Neurodiversity Literacy Program for Knowledge, Attitude, and Behavioral Intention among Adolescents: A Pilot Single-Arm Trial

Liow Jia Li, Pet Jia Yi, and Wong Xio Zen

Universiti Tunku Abdul Rahman

This research project is submitted in partial fulfilment of the requirement for the Bachelor of Social Science (Hons) Psychology, Faculty of Arts and Social Science, Universiti Tunku Abdul Rahman. Submitted on November 2019.

ACKNOWLEDGEMENTS

We would like to show our gratitude to those who have helped us in the completion of our Final Year Project. First and foremost, we would like to express our utmost appreciation to our supervisor, Mr. Pheh Kai Shuen for continuously supporting and supervising us throughout this project by sharing his insight, expertise, valuable guidance, and encouragement to us. Without him, this research would have been impossible to conduct.

Next, our sincere thanks also go to Ms. Yunice (Island Hospital Penang) and Ms. Soo (Chung Ling Private High School) for providing us advice on the ideas of the activities in the development of an intervention program and guiding us through the process of conducting it.

Moving on, we would also like to thank our friends who have supported us along the way. They have provided us with useful information and ideas in the improvising of our project.

Lastly, we would like to say a million thanks to our family. Although they did not play a part in the execution of this project, the morale and continuous support that they have provided us with have motivated us to make every effort in the process of completing our Final Year Project.

Liow Jia Li

Pet Jia Yi

Wong Xio Zen

APPROVAL FORM

This research paper attached hereto, entitled “The Effects of a School-based Neurodiversity Literacy Program for Knowledge, Attitude, and Behavioral Intention among Adolescents: A Pilot Single-Arm Trial” prepared and submitted by LIOW JIA LI, PET JIA YI, AND WONG XIO ZEN in partial fulfillment of the requirements for the Bachelor of Social Science (Hons) Psychology is hereby accepted.

_____ Date: _____

Supervisor

(Pheh Kai Shuen)

Abstract

In mainstream schools, there is a lack of understanding, empathy, social acceptance, and awareness in the issue of discriminatory behaviour among the mainstream students and teachers towards the neurodiverse students. Thus, the present study used a mix methods single-arm trial to examine the effects of a neurodiversity literacy program among Malaysian adolescents' knowledge, attitude, and behavioral intention towards neurodiverse students. Thirty-six high school students aged between 13 and 17 with a mean age of 15 (*SD* = 1.3) from Penang were recruited as the participants in this study through purposive sampling method. Measures of knowledge, attitude, and behavioral intention were administered to all participants at pre-test and post-test. An open-ended qualitative feedback was also collected from the participants. The quantitative results of the current study indicated that there was a significant increase in knowledge, sheltering subscale of Community Living Attitudes Scale-Intellectual Disability (CLAS-ID) and behavioral intention at post-test, whereas there was no significant difference in empowerment, exclusion, and similarity subscales of CLAS-ID. The qualitative results indicated an increase in the majority of the adolescents' knowledge, and an improvement in the minority of the adolescents' attitudes and behavioral intentions. Further research is required to identify the potential impact of a longer duration of a neurodiversity literacy program on the knowledge, attitudes, and behavioral intention of adolescents in Malaysia.

Keywords: Neurodiversity, knowledge, attitude, empowerment, exclusion, sheltering, similarity, behavioral intention

DECLARATION

We declare that the material contained in this paper is the end result of our own work and that due acknowledgement has been given in the bibliography and references to sources be they printed, electronic or personal.

Name : LIOW JIA LI

Student ID : 16AAB00091

Signed :

Date : 18th Nov 2019

Name : PET JIA YI

Student ID : 17AAB00777

Signed :

Date : 18th Nov 2019

Name : WONG XIO ZEN

Student ID : 16AAB00312

Signed :

Date : 18th Nov 2019

Table of Contents

List of Tables

List of Figures

List of Abbreviations

ADHD	Attention Deficit Hyperactivity Disorder
ASD	Autism Spectrum Disorder
CLAS-ID	Community Living Attitudes Scale-Intellectual Disability
CRPD	Convention on the Rights of Persons with Disabilities
IDLS	Intellectual Disability Literacy Scale
IEP	Inclusive Education Program
KAB	Knowledge, Attitude, and Behavioral Intention
MOE	Ministry of Education
MWFCD	Ministry of Women, Family and Community Development
PBP	Peer Buddy Program
SDG	Sustainable Development Goals
SEIP	Special Education Integrated Program
SEN	Special Educational Needs
SLD	Specific Learning Disorder
WHO	World Health Organization

Chapter 1

Introduction

Background of Study

Approximately one billion out of seven billion people in the world or 15% of the world's entire population is living with some kind of disability. Specifically, people who are affected with severe disabilities ranged from 110 million to 190 million, which is nearly one-fifth of the total world population (World Health Organization [WHO], 2018). The prevalence of disability tends to be higher in developing countries. It has also become a global public health concern, especially in developing countries, since it is almost impossible to ignore the existence of people living with some form of disability (WHO, 2018), which includes Malaysia. In Malaysia, there were a total number of 51520 children and adolescents in the age range between 3 and 18 who were found to be affected by disabilities in 2016. Among these children and adolescents, 38396 of them were found to have learning disabilities (Jabatan Kebajikan Masyarakat, 2016), and it recorded the highest among all other categories of disabilities. Hence, learning disability, or also known as neurodiversity in the Malaysian context, is the main issue addressed in the current study.

At the global level, the United Nation (UN) has publicly declared that every child should be entitled to receive equal educational opportunities without being discriminated against in the mainstream education system (World Bank, 2019). It has successfully raised the awareness of people around the world on the issue of inclusion practice, which is the exercise of integrating children with disabilities into mainstream schools. Besides that, the United Nations Convention on the Rights of Persons with Disabilities (CRPD) also encouraged the incorporation of people living with disabilities in society. The CRPD has also emphasized the importance of international efforts and development in pointing out the rights

of people with disabilities to the public. This is exemplified in one of the commitments undertaken by the World Bank Group to hasten international action in including people with disabilities within the mainstream education system in July 2018 during the Global Disability Summit which was held in the United Kingdom (World Bank, 2019).

Based on World Bank (2019), the inclusion practice is important in helping to save the cost of government and encouraging students with disabilities to complete their primary education, but most importantly, it plays a major role in eliminating the issue of discrimination. However, the implementation of inclusive education requires alteration in the school systems. It may only be successful if the country made commitments during the process of putting it into practice such as acquiring proper legislation, providing explicit policy direction, developing a national plan of inclusion practice, setting up infrastructures, and ensuring the capacity for execution (World Bank, 2019).

In order to ensure that children with disabilities are able to learn effectively in mainstream schools, an inclusive learning environment would be more appropriate for them. Thus, the inclusive education system may require alterations in the syllabus, teaching styles, assessments, and examination systems (WHO, 2011). This is because all these factors impact the efficiency and effectiveness of the learning experience of children with disabilities. Therefore, these changes would need to be altered based on the condition of the students with disabilities to help them in achieving their full potential in the classroom. In some cases, additional support services such as special education teachers, classroom helpers, and therapy services may be required by the children (WHO, 2011). In support of classroom helpers, the "Peer Buddy Program" (PBP) has been shown to be successful in the inclusion of children with disabilities in mainstream schools and the enhancement of accessibility of children with disabilities to the general education curriculum. It is where a mainstream student will be

paired up with Special Educational Needs (SEN) students to provide necessary assistance to them (Ministry of Education [MOE], 2013).

An early example of research into PBP includes the inclusion of neurodiverse students in mainstream schools (Staub, Spaulding, Peck, Galluci, & Schawartz, 1996). Overall, there was a positive outcome found on using PBP to help neurodiverse students to exhibit growth in several aspects. Over the past decade, the research in PBP has emphasized on the use of PBP in helping neurodiverse students to adapt to the general education classrooms, focusing on whether peer buddies can be trained to help neurodiverse students (Carter, Cushing, Clark, & Kennedy, 2005). However, for multiple years, the needs of neurodiverse students were still neglected, although more care and attention were needed by them (Pudaruth, Gunputh, & Singh, 2017). In recent years, there has been a gradual increase amount of studies on PBP to enhance social interaction and academic achievement (Adams, 2016; Alqahtani & Murry, 2015; Carter et al., 2005; Foster, 2011; Hochman, Carter, Bottema-Beutel, Harvey, & Gustafson, 2015; Staub et al., 1996). Thus far, previous research findings into PBP have been consistent and have confirmed the effectiveness of PBP in increasing neurodiverse students' social interaction and academic achievement.

In 1929, Malaysia started its very first special school for the blinds under the collaboration of the Ministry of Social Welfare and members from the religious centers. The preparation schemes for special education were then officially started up by the MOE in 1961. During the 1980s and 1990s, there was a lack of expertise and technology in Malaysia in the field of special education; thus, education professionals were sent overseas to gain more understanding and skills about special needs education. Education professionals then made an effort to modify the knowledge and skills learned to fit into Malaysia's culture and practice. Since then, inclusive education, along with provisions for neurodiverse students has been launched in the past decade in the Malaysia Education Act 1996 (1998) (Zalizan & Manisah,

2014). In recent years, the study of special needs education has also been initiated in Malaysia, with financial help from the government in local universities. MOE, as well as the Ministry of Women, Family and Community Development (MWFCD), are responsible for providing education for students with SEN who are diagnosed with serious or multiple disabilities. Children who are suffering from learning disabilities such as Down Syndrome, mild Autism, developmental delays, Attention Deficit Hyperactivity Disorders (ADHD), and Specific Learning Disorder (SLD) will be positioned in the Learning Disabilities Programs in mainstream schools (Zalizan & Manisah, 2014).

According to the Malaysia Education Act 1996, before implementing the Zero Reject Policy in 2018, children with SEN who intended to register in a mainstream school were screened through by a medical officer as well as an officer from MOE and MWFCD. The purpose of this was to identify if the children were able to benefit from the national education program along with the mainstream students. In the Malaysia Education Act 1996, it was stated that children who were identified as being able to manage themselves independently would be eligible to be registered into the mainstream school, whereas children who do not have the ability to manage themselves independently will be situated in the Community-Based Rehabilitation (CBR) centers (Zalizan & Manisah, 2014). Therefore, children with severe disabilities who require the assistance or support of others in their daily life activities may not be accepted into mainstream schools, which was rather unfair for them.

In mainstream schools which consist of both SEN and mainstream students, students with SEN will not be placed permanently in the mainstream classroom as they will be attending other classes in the special needs classroom within the school. Otherwise, a special education teacher will enter the general education classroom to aid the students with SEN or the class teacher to effectively educate them (Zalizan & Manisah, 2014). After the launch of the Malaysia Education Act 1996, although students with SEN are now allowed to be

educated in the national school together with the mainstream students, Malaysia is still practicing exclusive education for many years. Owing to the beliefs and culture of exclusive education practice as the most ideal way to educate SEN students; thus, the practice of inclusive education in Malaysia has been recognized as a difficult move (Zalizan & Manisah, 2014).

In Malaysia, the three types of special education programs provided for special needs children are 'the Special Schools', 'the Special Education Integrated Program' (SEIP), and 'the Inclusive Program' (MOE, 2004). As mentioned above, before enrolling into any of these schools, students with SEN would need to undergo a screening test by the MOE and MWFDC to ensure the school that they attend to is suitable for them. A Special School, or also known as Special Education School, is an exclusive educational practice as students with SEN are placed in a school where they are set apart from the general education students (MOE, 2004). Based on the Malaysia Education Blueprint 2013-2025, students who enter the Special Education School are usually SEN students with low-functioning and an inability to manage themselves independently. There are a total of 28 primary schools and five secondary schools which are registered as Special Education School for children who are diagnosed with hearing and visual impairment as well as learning disabilities (MOE, 2013).

On the other hand, SEIP is a national school that accepts students with SEN into the learning environment in conjunction with mainstream students (MOE, 2004). Although they are accepted into the mainstream school, they are situated in a different classroom than the typically developing students. However, they still share the same facilities within the school (MOE, 2004). As reported in the Malaysia Education Blueprint 2013-2015, SEIP takes in SEN students who are functioning moderately in a fixed classroom in mainstream schools (MOE, 2013). The Malaysia Education Blueprint 2013-2025 has indicated that there are a greater number of SEIP than Special Education Schools. As of now, there are a total number

of 1315 primary schools and 738 secondary schools that are implementing the SEIP in which specific classes will be dedicated to students with SEN (MOE, 2013).

Besides that, another program provided by the Malaysian government is the Inclusive Education Program (IEP). The MOE has been strongly encouraging all mainstream schools to implement the IEP. The IEP is where students with SEN will enrol in the mainstream schools together with the typically developing students in the same classroom setting (MOE, 2004). As outlined in the Malaysia Education Blueprint 2013-2015, IEP is a program that is attended by SEN students with high functioning and the ability to manage themselves independently. IEP usually only involves about one to five students with SEN in the mainstream classrooms together with the typically developing students (MOE, 2013).

In 2008, the Persons with Disabilities Act (2008) was established and made effective in Malaysia to protect the person with disability rights. This act included several statements that addressed the rights of people with disabilities such as being able to access to public facilities, equipment, and services. Besides that, people with disabilities should have the right to have the opportunity for education and cultural life. The act also protected the person with disability rights in terms of providing them the opportunity to enjoy sports and entertainment. It also stressed on the services that have protection towards their physical health, daily functioning skills, and mental health (Person with Disabilities Act, 2008). Particularly focusing on the rights of the person with disabilities on having access to education, the MOE has established a policy to protect this particular right for them. The MOE Malaysia, dated on 2018 December 26 and in the circular letter KPM. 100-6/1/25 Jld. 13(16), has established the Zero Reject Policy. It is in line with the statement by the Minister of Education Malaysia, Dr. Maszlee Malik, that all children, regardless of typically developing children or special needs children will be given equal opportunities to access to the same education. The principals of all mainstream schools are required to accept all students with SEN upon online registration.

Not only that, school authorities also have to take the responsibility to ensure that they meet the needs of the students with SEN. Lastly, teachers are also required to plan and implement an individual educational plan for all students with SEN (Shaari, 2018).

Problem Statement

According to the Malaysia Education Blueprint 2013-2025, the Ministry aims to provide SEN students a chance to pursue formal education which is appropriate to their needs. Therefore, inclusive programs have been implemented in mainstream schools for many years, yet the inclusion programs were recorded to have only 6% of students with SEN. A possible reason for this may be the inability of general schools to evaluate or baseline their inclusive education programs, and thus have uncertainties about where they stand or the ways to improve (MOE, 2013). It was also found that SEN children were struggling in the learning environment of mainstream schools which were inappropriate in fulfilling their needs and they were unable to obtain sufficient and necessary interventions to minimize their deficits and to enhance their potential (Peters, 2010). Although the Ministry has established a customized curriculum for students who are blind or deaf, it is still insufficient to support students with learning disabilities (MOE, 2013). Therefore, the MOE seemed rather unwilling to implement a teacher aid program to help children with SEN in mainstream schools (National Early Childhood Intervention Council [NECIC], 2013).

Moreover, there is a lack of awareness in the issue of discriminatory behavior and social acceptance among the public towards students with SEN. In mainstream schools, general education students and teachers have inadequate understanding and empathy towards students with SEN (MOE, 2013). With respect to this, the results of a past study have indicated that children who suffer from behavioral, mental, and intellectual difficulties had a

higher tendency to be criticized and stigmatized by others as compared to children who suffer from physical difficulties. The family members of neurodiverse students also tend to scold them, whereas the community members tend to physically beat them (Moore & Bedford, 2017). Children with learning or behavior difficulties were reported to be treated cruelly and unpleasantly by the community, siblings, and peers. The occurrences of mistreatment in children with disabilities are due to the fact that they are unable to avoid being mistreated, therefore seemed like an easy target. People who have negative beliefs about individuals with disabilities such as 'obnoxious' or 'insulting' also tend to have the belief that it is reasonable to bully them (Moore & Bedford, 2017).

In addition, it was found that there was a lack of interaction between the SEN students and the general education students (Zuki & Rahman, 2016). In another past study, the results indicated that students with SEN only had greater interaction with the general education students in an academic context, which did not help SEN students to build up social relationships that are required for a broad social setting. This is because the implementation of programs to improve the academic skills of children are more focused in general education classrooms, instead of their experiences, emotions, and social life. Hence, these major aspects which are important to the SEN children, are neglected in the general education classrooms (Adams, 2016).

Significance of Study

The current study aspires to play a part in this growing area of research by examining the effects of a neurodiversity literacy program on the knowledge, attitude, and behavioral intention of typically developing students towards special needs students in Malaysia.

According to the United Nations (2015), the Sustainable Development Goals (SDG) consist of 17 goals to make the world and earth a better place for all through the actions of ending poverty, protecting the planet, and ensuring that all individuals live a peaceful and wealthy life by 2030. The fourth goal of SDG appeals for an education of equal quality and lifelong learning opportunities to be provided to all, including those with disabilities. Specifically, goal 4.5 aims to put an end to the gender differences in education and to make sure that all people, including those with disabilities, have equal access to education and vocational training, regardless of the level of education. Furthermore, goal 4.A also aims to establish and improve education facilities sensitive to the needs of children, disabilities and gender as well as to provide an effective learning environment that is free from any harm or violence and is inclusive for all people (United Nations, 2015). Hence, the current study is in line with goals 4.5 and 4.A of the SDG.

In the practice of including children with disabilities into mainstream schools, the MOE (2013) has recently contributed to implementing this action plan by introducing a plan to enhance the awareness of the public to move towards a society that promotes the full inclusion of people with disabilities. It also plans to increase the awareness of service providers to enable various organizations or agents to cooperate and to utilize various resources efficiently in the promotion of social inclusion of individuals with disabilities/ intellectual disabilities. For example, the "Inclusive Education Program" is an educational program for students with special educational needs which is attended by special needs students along with other students in the same class at government aid schools has been launched (MOE, 2013). The purpose of this is to ensure that special education needs students to have equal opportunity as the typically developing students to receive education in mainstream schools. Another notable example of the contribution which is done by the MOE is the initiation of a pilot scheme to implement a buddy club, or also known as the PBP as

mentioned above, in preschools, primary schools, secondary schools, or as an activity after school with the involvement of the community. The government also plans to carry out a training program for educators in community centers to aid the students with SEN (MOE, 2013). However, the MOE has not executed the PBP plan. Thus, the current study may contribute to or accelerate the action of the government in executing the plan to run the PBP in mainstream schools in Malaysia.

In addition, recent research has indicated that parents of children with learning disabilities have been found to experience a high level of stress, and this may, in turn, cause them to have a higher tendency to develop illnesses caused by stress and a lower capability to take care of their children (Siti et al., 2017). In this case, with the assistance of peer buddies in mainstream schools to help neurodiverse students in adapting to the general education classroom, it may help to reduce the burden and the stress level of their parents, since the neurodiverse students are well-treated or well-adapted to the general education classroom.

Research Objectives

The objectives of the current study are:

1. To examine the effects of a neurodiversity literacy program on Malaysian adolescents' knowledge.

2. To examine the effects of a neurodiversity literacy program on Malaysian adolescents' attitudes.

3. To examine the effects of a neurodiversity literacy program on Malaysian adolescents' behavioral intention.

4. To examine what did Malaysian adolescents learn from the neurodiversity literacy program based on their qualitative feedback.

Research Questions

The research questions of the current study are:

1. What are the effects of a neurodiversity literacy program on Malaysian adolescents' knowledge?

2. What are the effects of a neurodiversity literacy program on Malaysian adolescents' attitudes?

3. What are the effects of a neurodiversity literacy program on Malaysian adolescents' behavioral intention?

4. What did the Malaysian adolescents learn from the neurodiversity literacy program based on their qualitative feedback?

Research Hypotheses

The research hypotheses of the current study are:

Research hypothesis 1:

H_0: There is no significant difference in knowledge among the participants between pre-test and post-test.

H_1: There is a significant difference in knowledge among the participants between pre-test and post-test.

Research hypothesis 2:

H_0: There is no significant difference in attitude among the participants between pre-test and post-test.

H_1: There is a significant difference in attitude among the participants between pre-test and post-test.

Research hypothesis 3:

H_0: There is no significant difference in behavioral intention among the participants between pre-test and post-test.

H_1: There is a significant difference in behavioral intention among the participants between pre-test and post-test.

Conceptual and Operational Definition

Disability. Disability is an umbrella term to define individuals as being impaired, limited to activities and restricted to participation. Individuals who have health problems like cerebral palsy, Down Syndrome, and depression also tend to experience personal and environmental issues such as inaccessibility to transport and public buildings as well as restricted social support (WHO, 2018).

Special education needs. According to the Malaysia law, SEN has been officially defined in 1996 when the Education Act has taken its effect. SEN can be used to refer to students who are diagnosed with visual, hearing or speech disabilities, physical disabilities, and learning disabilities (The Government of Malaysia's Official Portal, n.d.).

Learning disabilities. Learning difficulties or learning disabilities is defined as an individual who is diagnosed with Down Syndrome, Autistic Spectrum Disorder (ASD), ADHD, mild mental retardation, and SLD (Ministry of Education Official Portal, 2011).

Neurodiversity. Neurodiversity can be described as an unusual neurodevelopment of an individual. It is considered as a common difference in human beings and it should be accepted and respected equally as other common differences found in each human being (Griffin & Pollak, 2009). The concept of neurodiversity is mainly related to ASD, ADHD, and SLD such as Dyslexia, Dyscalculia, and Dyspraxia (Jaarsma & Weilin, 2011).

Inclusive education. The Inclusive Education System is an education that is provided to all students regardless of their abilities or requirements without discrimination at all levels of education such as from pre-school to tertiary level education, technical and life-long learning (United Nations Children's Fund [UNICEF], 2017). It does not merely represent the practice of including neurodiverse students into mainstream schools but is a process of acknowledging the neurodiverse students by encouraging them to participate in the class and minimizing the practice of exclusive education (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2007).

Neurodiversity literacy program. Neurodiversity literacy program is an intervention program that aims to introduce the concept of neurodiversity to adolescents. It is developed for adolescents with the main objective to increase their knowledge of neurodiversity and changing or improving their attitude as well as behavioral intention towards neurodiverse students. The effectiveness of the neurodiversity literacy program is measured by using the Intellectual Disability Literacy Scale (IDLS) and the Community Living Attitudes Scale-Intellectual Disability.

Knowledge. Knowledge can be used to refer to the knowledge of intellectual disabilities which measures the amount of one's understanding of people with intellectual disabilities (McManus, Feyes, & Saucier, 2010). The operational definition of knowledge can be defined as adolescents' understanding of the general symptoms and potential causes of intellectual disabilities (Blundell, Potts, & Scior, 2015). The knowledge of mainstream students on neurodiversity is measured by the IDLS which includes the causal beliefs to intellectual disabilities (Scior & Furnham, 2011).

Attitude. The term 'attitude' is multidimensional and encompasses affective, behavioral, and cognitive components (Diamond, Hestenes, Carpenter, & Innes, 1997). Prior studies have noted that attitude can predict behavior (Holtz & Tessman, 2007). In the studies of neurodiversity literacy, the affective dimension refers to the feelings of mainstream students towards neurodiverse students, the behavioral dimension refers to the intentions of mainstream students to interact with neurodiverse students, and the cognitive dimension refers to the beliefs of mainstream students about neurodiverse students (Campbell, 2006). However, some studies argued that attitude and behavior should be separated as they are two different components (Ajzen & Fishbein, 1980) and there is no connection between them (Swaim & Morgan, 2001). The operational definition of attitude refers to the attitudes towards the acceptance of students with intellectual disabilities into the usual environment together with the mainstream students. The attitudes of mainstream students are measured by using the CLAS-ID. It includes four subscales, namely empowerment, exclusion, sheltering, and similarity (Henry, Keys, & Jopp, 1999).

Behavioral intention. Behavioral intention has been used to describe the practice of mainstream students towards neurodiverse students, which was assessed by the willingness of mainstream students to participate in social activities and academic activities with the neurodiverse students in school (Gus, 2000; Holtz & Tessman, 2007; Mavropoulou &

Sideridis, 2014; Swaim & Morgan, 2001). The operational definition of behavioral intention can be used to refer to the adolescents' willingness to engage in social interactions with students with intellectual disabilities. The behavioral intention of the adolescents is measured by using the vignette technique in the IDLS in terms of their willingness to have contact with neurodiverse students (Scior & Furnham, 2011).

Chapter 2

Literature Review

The implementation of inclusive education in previous decades has changed the social environment of neurodiverse students (Gus, 2000). Instead of being educated in special schools, neurodiverse students are now able to learn in the same environment as mainstream students. Although the inclusion of neurodiverse students in mainstream schools has brought advantages for them, stereotype against neurodiverse students has also long been an issue for the past decades (Bless & Amrein, 1992; Gash & Coffey, 1995). For example, the general public is often unfriendly and inconsiderate towards children with special needs, and they also have stereotypical reactions towards them. Therefore, children with special needs are often being stigmatized by the general public due to their lack of knowledge of neurodiversity, which influenced mainstream students to react similarly by having negative attitudes and behaviors towards neurodiverse students; hence, causing them to be misunderstood and less accepted by mainstream students upon first contact (Gray, 1993). Awareness of stereotype towards students with special needs is not recent, since the knowledge, attitude, and behavioral intention (KAB) of typically developing students have been studied in the early 1990s to measure their level of KAB towards neurodiverse students. An important finding was that mainstream students who had sufficient knowledge about neurodiverse students were those who have heard of certain disorders. They also showed a negative attitude and behavior towards them (Brown, Ouellete-Kuntz, Lysaght, & Burge, 2011; Campbell & Barger, 2011). With respect to this, there was a need for an intervention program to improve these three aspects. A considerable body of literature has been published on using intervention programs to foster KAB among mainstream students (de Boer, Pijl, Minnaert, & Post, 2014; Gus, 2000; Holtz & Tessman, 2007; Mavropoulou & Sideridis, 2014; Swaim & Morgan, 2001). The majority of studies on KAB have been quantitative and adopted a survey

method, while two studies were based on a mixed-methods such as using survey and open-ended questionnaires (Gus, 2000; Brown et al., 2011). All participants in the previous studies involved kindergarten, primary, or high school students. In general, previous research findings into intervention programs to enhance KAB have been consistent and effective to improve mainstream students' KAB towards neurodiverse students (Campbell & Burger, 2011).

Theoretical Framework

Theory of Planned Behavior. The Theory of Planned Behavior (Ajzen, 1985) is an extension of the Theory of Reasoned Action by including beliefs about an object and opportunities for carrying out a particular behavior. The Theory of Planned Behavior proposed that there are three different factors of behavioral intention, namely attitude, subjective norm, and perceived behavioral control.

First, attitude can be referred to the extent to which an individual adopts a positive or negative evaluation of a particular behavior. Based on the Theory of Planned Behavior, the second determinant of behavioral intention, which is a subjective norm, is related to the social aspect. It is used to refer to the individual's appraisal of the social pressure to determine whether or not the behavior should be performed. Perceived behavioral control, which is the third factor of behavioral intention, refers to the extent to which an individual evaluates the behavior to be easy or difficult to perform. It is influenced by the previous experience of the individual and anticipated challenges (Ajzen, 1991).

The Theory of Planned Behavior suggested that knowledge and beliefs can be used to form attitude, which in turn leads to the prediction of behavior. Thus, in order to change the attitude and behavior of an individual, new information about a thing, behavior, problem, or

situation should be involved and exposed to the individual to bring about change (Fishbein & Ajzen, 1975). It is postulated that the more information people have about an object and the more opportunities people have in order to carry out the behavior, the more likely they will perceive the behavior as easier to be performed (Ajzen, 1985).

Generally, if people possess a positive attitude and subjective norm towards a behavior, and they have more control over their behavior, they will have a stronger intention to carry out the behavior after being thought about it. However, it is not necessary that in all situations these three factors will predict the behavioral intention of all individuals. In some situations, attitude was found to have the most significant impact on behavioral intentions, whereas in some cases, attitude and perceived behavioral control can be used to explain a person's behavioral intentions. Thus, whether or not these three factors are able to predict a person's behavioral intention differs across behaviors and circumstances (Ajzen, 1991).

In summary, an individual's knowledge may predict attitude, which in turn predicts behavior. Therefore, in order to alter a person's attitude and behavior, new information about an object, person or event can be exposed to the person to increase his or her knowledge, which may lead to a change in attitude and behavior.

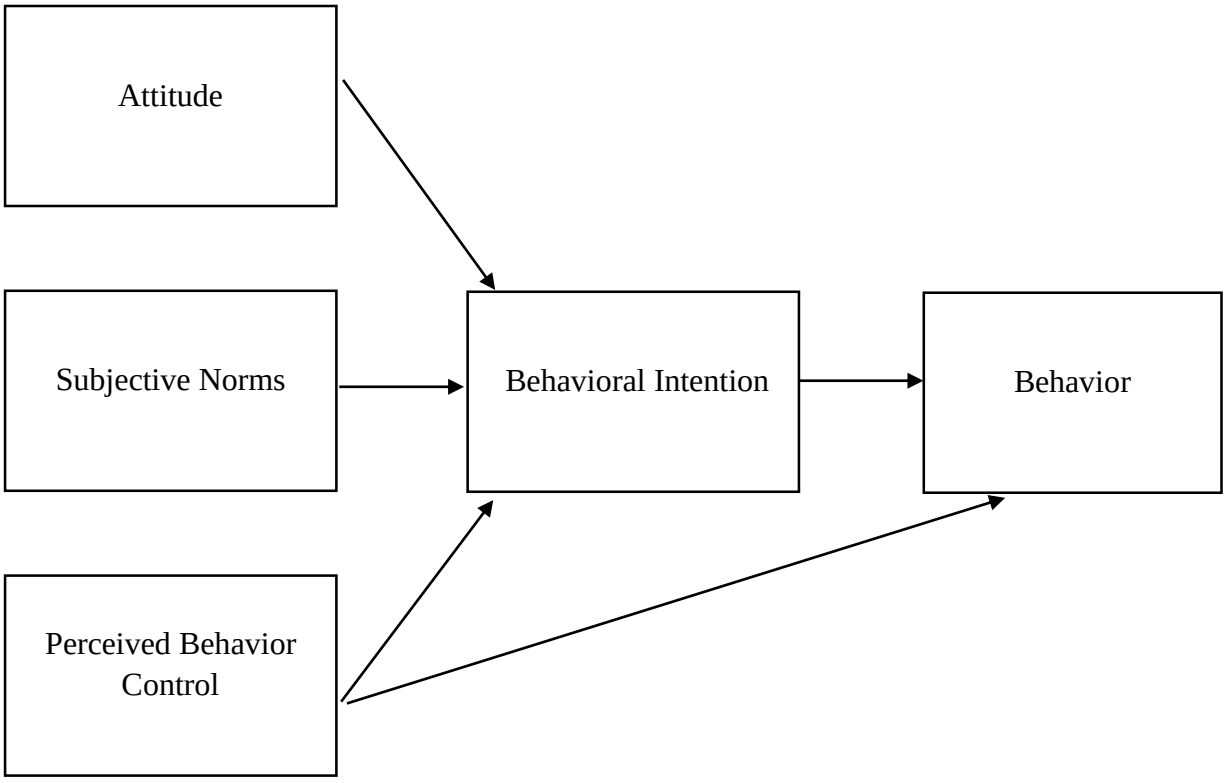


Figure 2.1. Theoretical framework of theory of planned behavior.

Knowledge of Mainstream Students on Neurodiversity

In Campbell and Barger (2011)'s study, it was suggested that inaccurate beliefs and assumptions about Autism of mainstream students contributed to the rejection of students with Autism. One reason for this is that they may inaccurately assume students with Autism who usually find it hard to look at others to be rude or lack interest (Campbell & Barger, 2011). Specifically, they refer knowledge of Autism in terms of the cause, development, symptoms, and contagiousness of Autism. Thus, assessment on the mainstream students' knowledge level on Autism can be used to determine the possible areas of false information, which is useful for the development of interventions to increase the knowledge of Autism among them.

In a cross-sectional study that measured the knowledge of mainstream students, it was found that students who had more knowledge about Autism were those who were aware of it. Most of the students were aware of the causes and development of Autism, and whether or not Autism is contagious. Besides that, more than half of the students were also aware of the fact that students with Autism find it hard to look at others. What is surprising is that there were still a small number of students who believed that Autism was not a chronic disorder, was not related to brain-based etiology, and was contagious. However, mainstream students' awareness and knowledge of Autism were found to be different across schools as it greatly depended on the extent to which schools supported the notion of inclusive education (Campbell & Barger, 2011).

Attitudes of Mainstream Students on Neurodiversity

As noted by de Boer et al. (2014), the acceptance of mainstream students towards neurodiverse students greatly depended on their attitudes. Several definitions of attitude have been proposed. Although there are differences of opinion in defining the term, there seems to be an agreement that the attitude of mainstream students is important in determining whether they would accept neurodiverse students (de Boer et al., 2014).

Many of the studies since the 1993 emphasized that mainstream students had a positive attitude towards neurodiverse students (Bossaert, Colpin, Pijl, & Petry, 2011; McDougall, DeWit, King, Miller, & Killip, 2004), especially typically developing female students (Townsend, Wilton, & Vakilirad, 1993; Wieczorek, Sadziak, & Matczak, 2019). For example, they were more willing to accept and provide help to neurodiverse students. One reason for this is due to the efforts of the school in providing opportunities to integrate neurodiverse students within the school environment; hence, mainstream students held more

positive attitudes towards them (Townsend et al., 1993). In general, although the mainstream students showed a positive attitude towards the neurodiverse students in the majority of the past studies, Lee & Shin (2019) concluded that there was still a slight number of typically developing students who had very or exceptionally negative attitudes towards the special needs students despite that they were aware of neurodiversity. Therefore, there is a need to implement a more meaningful and standardized intervention program to improve the attitudes of mainstream students.

Behavioral Intention of Mainstream Students on Neurodiversity

According to Nikolaraizi and de Rebekiel (2002), the attitudes of typically developing students may predict their behaviors towards students with special education needs. It encompasses social interaction and social engagement (Brown et al., 2011). Neurodiverse students who were placed in the general education classroom usually only communicate with other neurodiverse students or remain isolated. Their interactions with mainstream students tend to be short and surface (Dore, Dion, Wagner, & Brunet, 2002). They also do not feel belonged, safe, and accepted as compared to mainstream students, since they tend to feel lonely and isolated. In addition, they are more likely to view other students as being unkind to them and have more conflict with others at school (Hogan, McLellan, & Bauman, 2000). Based on the contact theory, mainstream students who contact with neurodiverse students can reduce their stereotype against neurodiverse students, thereby improving their attitudes and behaviors (Cummins & Lau 2003; Krajewski & Flaherty, 2000; Krajewski & Hyde 2000). Contact between mainstream students and neurodiverse students must be purposeful and positive for the interaction to be positive (Brown et al., 2011). Therefore, in order for the inclusion of neurodiverse students into mainstream schools to be successful, it is important to

improve mainstream students' behavioral intentions to enhance the interaction between mainstream students and neurodiverse students.

Previous research has found that it was possible for mainstream students to have feelings of social politeness towards neurodiverse students; however, they may not feel comfortable to build and maintain a close friendship with neurodiverse students (Nikolaraizi & de Rebekiel, 2002). This result is similar to a study that found out that mainstream students were more comfortable with interacting with neurodiverse students in activities that allowed a social distance between them. The difference in the common interest and level of functioning between mainstream students and neurodiverse students are two key factors in influencing mainstream students to resist any forms of interactions with neurodiverse students. Moreover, they also felt a greater responsibility was required to take care of the neurodiverse students. For example, when a mainstream student and a neurodiverse student are paired together to work on a class task, the mainstream student may undermine the ability of neurodiverse students' ability to complete the class task (Brown et al., 2011).

Effects of Neurodiversity Literacy Program on Knowledge of Mainstream Students

Packer (2005) suggested that knowledge is important to be included as part of the intervention program because peer rejection may occur due to the lack of knowledge on neurodiversity. Therefore, expanding mainstream students' knowledge is essential to reduce their feeling of fear and dissimilarity, and to promote empathy towards neurodiverse students to prevent the occurrence of social rejection (Holtz & Tessman, 2007). Based on the behavioral change theory, an individual's knowledge and beliefs may form one's attitude, which in turn predicts the person's behavior. Hence, the intervention program on expanding mainstream students' knowledge on neurodiversity may help to change their inappropriate

attitude towards neurodiverse students (Fishbein & Ajzen, 1975). Previous research has established that although the intervention carried out to expand mainstream students' knowledge was indeed brief, it successfully reduced their stigma towards students with Tourette Syndrome (Holtz & Tessman, 2007). Overall, the results indicated that intervention programs were effective in disseminating the knowledge to the mainstream students, which in turn increased their knowledge of neurodiverse students.

Past study has indicated that students with Autism were unfairly stereotyped by mainstream students who had no idea of ASD as "slow and simple"; hence, they rejected by others (Gus, 2000). With regard to this, intervention programs were carried out to increase the knowledge of mainstream students about neurodiversity. The effectiveness of the intervention program was evidenced in a study by Swaim and Morgan (2001) which found out that children were able to differentiate peers who were portraying autistic behavior if they have increased knowledge about neurodiversity. The effect of the intervention program on mainstream students' knowledge about neurodiversity is similar to those reported by Gus (2000) in which children were able to be more aware of people with different characteristics in their surroundings. Besides that, several studies have also shown that mainstream students who had prior awareness or contact with neurodiverse students were able to gain more knowledge through an intervention program as compared to those who had no prior awareness or contact with neurodiverse students (Holtz & Tessman, 2007; Mavropoulou & Sideridis, 2014). Prior studies also indicated that there was no grade or age difference in the increase of knowledge through an intervention program (Mavropoulou & Sideridis, 2014). The most surprising aspect of the qualitative result was that one of the participants showed interested in knowing more about ASD (Gus, 2000). Therefore, considering all these evidence, it seems that the intervention program did not merely help in increasing the

knowledge of mainstream students towards neurodiverse students, but also motivated them to learn more about neurodiversity.

Effects of a Neurodiversity Literacy Program on Attitude of Mainstream Students

The inclusion practices in schools without appropriate support may risk neurodiverse students to face negative attitudes from the mainstream students (Friedrich, Morgan, & Devine, 1996). Therefore, the attitudes of mainstream students need to be improved through intervention programs, to successfully implement inclusion policy.

The effectiveness of the intervention on mainstream students' attitudes towards neurodiverse students has been exemplified in previous studies. Mainstream students generally showed more positive attitudes towards neurodiverse students after the intervention, typically students with Autism (de Boer et al., 2014; Gus, 2000; Holtz & Tessman, 2007; Mavropoulou & Sideridis, 2014). Intervention such as a discussion on Autism among the mainstream students was effective enough to improve their attitude towards neurodiverse students such as being more tolerant, understanding, supportive, accepting (Gus, 2000), and empathetic (Mavropoulou & Sideridis, 2014) over time towards neurodiverse students. However, it was found that mainstream students who had contact with neurodiverse students would have more empathy towards them (Mavropoulou & Sideridis, 2014).

In contrast to earlier findings, however, some intervention programs were not effective to bring a change in the attitudes of mainstream students. Areas where major differences were found include younger mainstream students (Swaim & Morgan, 2011) and boys held more negative attitudes towards neurodiverse students over time (de Boer et al., 2014). Although the intervention did not succeed in improving the attitudes of mainstream students towards neurodiverse students, surprisingly, in a previous study on comparing

whether mainstream students had more negative attitudes towards students with intellectual disabilities, physical disabilities, or intellectual and physical disabilities, it was found that elementary mainstream students' attitudes towards those with intellectual disabilities or intellectual and physical disabilities were more negative as compared to those with physical disabilities (de Boer et al., 2014).

Effects of a Neurodiversity Literacy Program on Behavioral Intention of Mainstream Students

In Mavropoulou and Sideridis (2014)'s study, the neurodiversity literacy program has benefited the typically developing students of all ages and genders similarly in terms of their behavioral intentions towards the special needs students. Although being included in mainstream classrooms, many neurodiverse students will only either interact with other neurodiverse students or withdraw themselves from the mainstream students. This was due to the fact that students with special needs might have felt embarrassed and anxious as they were not being understood and accepted by others; therefore, to prevent themselves from being bullied by the mainstream students they were more likely to distance themselves from the mainstream students (Prestia, 2003). A previous study has established that mainstream students' behavioral intention should be guided through as they tended to have less communication, behave differently, or focus on a narrow set of topics with neurodiverse students who use the Augmentative and Alternative Communication (AAC) for communication (Carter, 2013). Therefore, there is a need to guide mainstream students in behaving appropriately to neurodiverse students.

Previous findings found in several studies showed that the intervention program to guide behavioral intention had a positive effect on mainstream students. Studies showed that

mainstream students who were in touch with Autism students portray a more positive behavioral intention towards them (Gus, 2000; Mavropoulou & Sideridis, 2014; Swaim & Morgan, 2001). This was evident in the case of mainstream students who started to interact and communicate with the Autism students in an appropriate way which made them felt accepted by their peers through constant engagement in social activities (Gus, 2000).

Together, these studies indicated that the neurodiversity literacy program may be able to help the mainstream students to improve their KAB towards neurodiverse students by encouraging the engagement of social and classroom activities with each other.

The overall strengths of these literature are they consisted of different research methods to collect data such as using survey method to assess the effects of an intervention program on the knowledge and attitude of mainstream students as well as interview method to explore the underlying causes of behavioral intentions of mainstream students towards the neurodiverse students. Not only that, these literature also consisted of quantitative and qualitative research studies. Hence, the findings of quantitative research studies were able to generalize to the larger population by proving statistical analysis and findings whereas the findings of qualitative research studies were able to study more in-depth on the underlying causes of behavioral intentions through interviews. Besides that, most of the literature also focused on Autism; thus, a greater amount of information on Autism can be obtained.

The overall weaknesses of these literature are first, there is not a standardized intervention program to enhance the KAB of mainstream students. Second, the behavioral intention measured in past studies may not be accurate as well, since it is measured using questionnaires.

It is unfortunate that the intervention programs in the majority of the past studies only focused on one of the aspects among KAB of mainstream students towards neurodiverse

students. For example, interventions that focused on the knowledge aspect may help to increase mainstream students' knowledge of neurodiversity. However, their attitude and behavior towards neurodiverse students may not be assessed. Thus, even if the knowledge of mainstream students has successfully improved through intervention program, their attitude and behavioral intention towards neurodiverse students were still unpredictable as it was not being assessed. Furthermore, there was also a lack of research on neurodiversity in general as past studies mainly focused on one particular disorder. For instance, most of the past studies focused on Autism as the cases of Autism has been increasing throughout the years, which has been a global concerning issue (Ting, Lee, Low, Chia, & Chua, 2014).

Conceptual Framework

The current study has adopted the Theory of Planned Behavior (Ajzen, 1985) to enhance the KAB of adolescents towards neurodiverse students. According to the Theory of Planned Behavior, the behavior of an individual can be improved through a change in the attitude in terms of their beliefs towards an object or event, which is caused by an increase in knowledge or information towards the object or event (Fishbein & Ajzen, 1975). Therefore, a neurodiversity literacy program was developed and implemented to improve adolescents' KAB towards neurodiverse students.

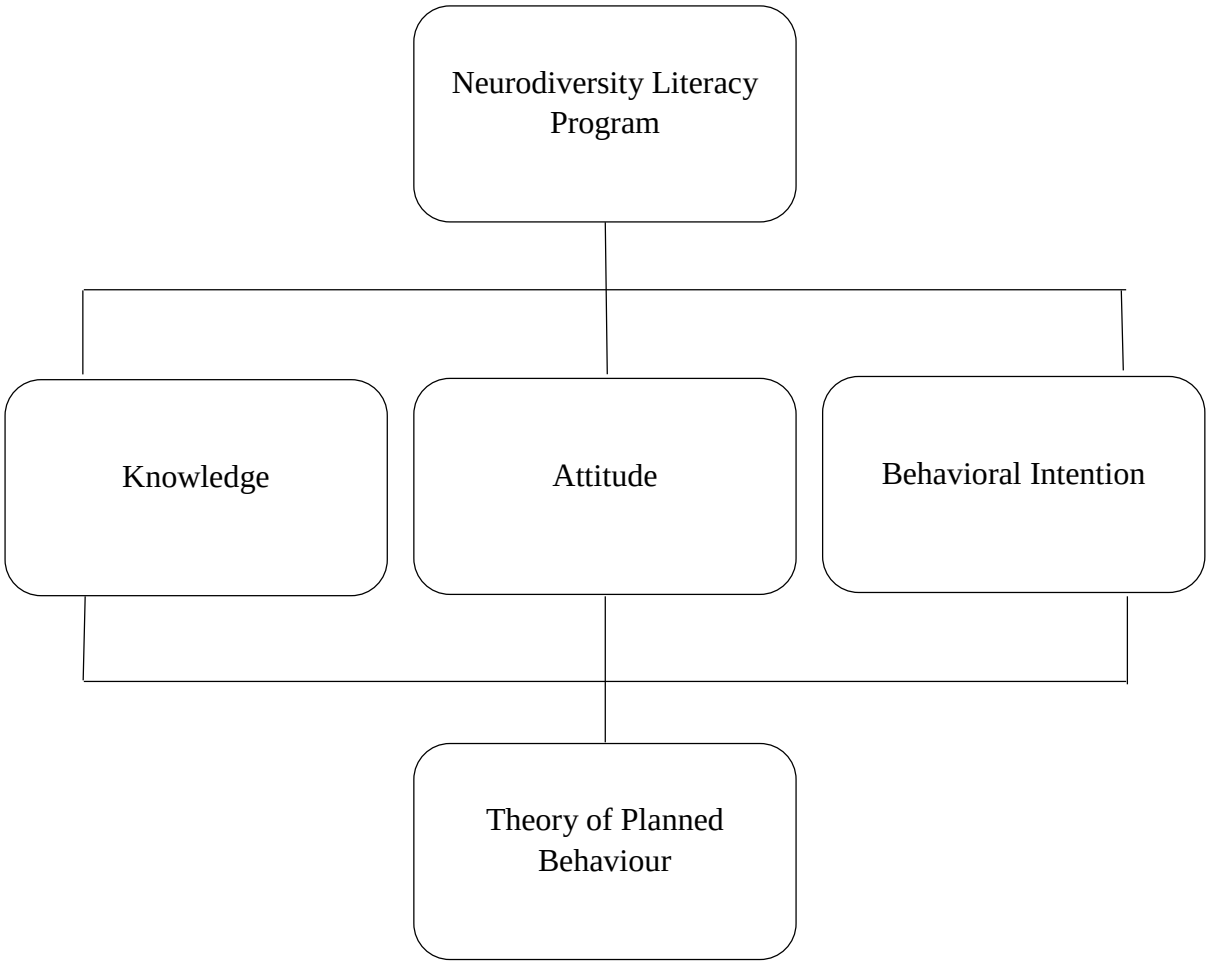


Figure 2.2. The conceptual framework of theory.

Chapter 3

Methodology

Research Design

The current study adopted a mixed-methods single-arm trial research design to evaluate the effectiveness of a neurodiversity literacy program on Malaysian adolescents' knowledge, attitude, and behavioral intention towards neurodiverse students. A pretest-posttest experimental design was used as the quantitative method for data collection, whereas handwritten feedback of the participants was used as the qualitative data in the present study. Self-report questionnaires were administered to the participants before the experimental treatment at pre-test, and after the experimental treatment at post-test. A single-arm trial approach was used to acquire preliminary evidence of the effectiveness of the treatment (Evans, 2010). Participants' written feedback about the neurodiversity literacy program were also collected at the end of the program.

Research Sample

The current study used a non-probability sampling method to select the participants, or more specifically, a purposive sampling method. A total of 36 high school students aged between 13 and 17 with a mean age of 15 (SD = 1.3) were recruited for this study. The rules of thumb suggested that the ideal number of sample size for a pilot trial includes at least 30 participants or more (Browne, 1995; Torgerson & Torgerson, 2008).

The participants of the present study involved prefects, peer helpers, class monitors and student leaders from Chung Ling Private High School, Penang. The reason why high school students were chosen as the target participants in this study was due to the reason that

high school settings are more achievement-oriented and have a greater class size as well as a higher expectation on students' academic performance. Therefore, peer interaction between general education students and neurodiverse students are neglected (Carter et al., 2005), since it is less likely to be emphasized in high school settings. During the transition period to adolescence, a more highly developed social skills are required to be mastered by adolescents; however, it is also during this period that neurodiverse students experience difficulties in making new friends or maintaining friendships (Matheson, Olsen, & Weisner, 2007; Tipton, Christensen, & Blacher, 2013).

Moreover, Penang was selected as the location of the current study due to the reason that among all the states in Malaysia, Penang is the second-highest state in having neurodiverse students who are involved in the inclusive education program, with a total number of 313 students (Data.gov.my, 2018). It also represents 12% of Chinese students with learning disabilities in Penang (Jabatan Kebajikan Masyarakat, 2016).

Besides that, there also exist two very important social problems within Chung Ling Private High School which were identified by the teachers, such as a lack of social interaction and bullying between mainstream students and neurodiverse students. Hence, an intervention program to improve the current condition of students in Chung Ling Private High School was requested by the school.

Table 3.1

Participants Demographic by Sex and Age

	Males	Females
Age		
13	1	3
14	4	5
15	1	2
16	3	11
17	0	6

Intervention

A neurodiversity literacy program was conducted for the participants. The neurodiversity literacy program included nine activities that were developed and accommodated from multiple online sources. The activities included perspective-taking activity, sensory overload obstacle activity, multiple intelligence model activity, anti-bullying activity, obstacle overcoming activity, video-viewing activity, 3R activity, and reflection session. The two-hour program was conducted for two days from 3 p.m. to 5 p.m. at Chung Ling Private High School, Penang. A more detailed description of the activities of the program is shown in Table 3.2.

Table 3.2.

Protocol Contents for Each Activity

Number	Description	Duration
1	An ice-breaking session was conducted to warm-up the participants for the program, to separate them into seven groups through ice breaker games, and to allow them to get to know each other.	15 minutes
2	Perspective-taking activity was conducted to convey each person's brain is structured differently; therefore, leads to different perspectives in seeing things and there is no right or wrong in these differences.	25 minutes
3	Sensory overload obstacle activity was conducted to let students experience how sensory overload feels like for people who are neurodiverse.	15 minutes
4	Multiple intelligence model activity was conducted to convey each person has their strengths and weaknesses and these differences should be acknowledged.	30 minutes
5	An anti-bullying activity was conducted to enhance student's empathy by allowing them to experience how helplessness, being bullied, and loneliness feels like.	20 minutes
6	Obstacle overcoming activity was conducted to promote tolerance, helping behavior and empathy among students.	45 minutes

7	A video-viewing session was conducted to provide information regarding symptoms of ADHD and ways to assist people with ADHD.	10 minutes
8	3R (Regulate, Relate, Reason) activity was conducted to teach students the appropriate ways of helping people who are neurodiverse.	45 minutes
9	Reflection session was conducted to allow students to share their experience and thoughts about the neurodiversity literacy program.	10 minutes

Research Procedures

This study was approved by the UTAR Scientific and Ethical Review Committee (SERC).

Recruitment of participants. E-flyers which contained information about the neurodiversity literacy program were designed and sent via email to the school. The school counsellor printed the e-flyers and distributed it to the prefects, peer helpers, class monitors, and student leaders.

Consent. Parental consent and youth assent forms were distributed to the prefects, peer helpers, class monitors, and student leaders who were interested in and agreed to participate in the neurodiversity literacy program.

Pre-test measurement. Participants were required to complete a set of self-report questionnaires which consisted of a demographic questionnaire, Knowledge of Autism (KOA), Intellectual Disability Literacy Scale (IDLS), and the Community Living Attitude

Scale-Intellectual Disability (CLAS-ID) before conducting the two-hour neurodiversity literacy program. Participants were given 15 to 20 minutes to complete the questionnaires.

Neurodiversity literacy program. Participants went through a two-hour training program that involved a series of activities on enhancing their knowledge, attitude, and behavioral intention towards individuals who are neurodiverse for two days.

Post-test measurement. After the training program, participants were required to complete the self-report questionnaire which consisted of the KOA, IDLS, and CLAS-ID. Participants were also given 15 to 20 minutes to complete the questionnaires.

Qualitative feedback. At the end of the neurodiversity literacy program, participants were given ten minutes to write down their experiences and thoughts about the program on a piece of paper. After that, it was collected from all participants as qualitative data.

Outcome Measures

Demographic Questionnaire. A demographic questionnaire was used to gather the students' information such as their name, age, and gender.

Knowledge of Autism (KOA). The Knowledge of Autism (KOA) scale was designed by (Campbell & Barger, 2011). It was designed to measure the participants' knowledge regarding the cause, development, sign, and contagiousness of autism. This questionnaire was used among high school students. The KOA scale was not developed and was only used in Campbell and Barger's (2011) study. It consists of ten items in which participants are required to answer true or false. Participants will be given one point for every correct answer and the total score can be obtained by summing up the points for every correct answer. There

are a total of five items in which the correct answers are ‘false’, such as “If someone has autism, it only lasts for about a week” and “Autism does not affect a person’s brain”. On the other hand, the correct answers for the remaining five items are ‘true’, such as “Students with autism often have a difficult time looking at other people” and “Students with autism sometimes repeat what is said to them”. The Cronbach’s alpha for KOA in the previous study was .47, which indicated a low internal consistency due to a small number of items and dichotomous scoring, unlike others which are scored by a Likert scale (Campbell & Barger, 2011). The Cronbach’s alpha for KOA in the current study was .47, which was similar to Campbell and Barger (2011)’s study.

Community Living Attitude Scale-Intellectual Disability (CLAS-ID). The CLAS-ID was developed by (Henry, Keys, & Jopp, 1999) and was used to assess participants’ attitudes to the social inclusion of individuals with intellectual disabilities. The scale consists of 17 items from the original 40-item version with four subscales, namely empowerment, exclusion, sheltering, and similarity. Empowerment refers to participants’ view of individuals with intellectual disabilities in terms of their ability to have the freedom of choice in making decisions that may influence their lives. Exclusion refers to participants’ desire to isolate individuals with intellectual disabilities from society. Sheltering refers to participants’ view that individuals with intellectual disabilities need others to assist them in their daily lives and to protect them from the dangers of life in society. Similarity refers to participants’ view that individuals with intellectual disabilities are very much alike to oneself, and share the same goals and rights in their lives.

The items in CLAS-ID are rated on a 6-point Likert scale ranging from 1 to 6 in which 1 indicates “Disagree Strongly” and 6 indicates “Agree Strongly”. The items 1, 2, and 12 need to be reversed. The total score of “empowerment” can be obtained by calculating the

mean of items 1R, 2R, 3, 4, and 5. The total score of "exclusion" can be obtained by calculating the mean of items 7, 8, 9, and 10. The total score of "sheltering" can be obtained by calculating the mean of items 6, 11, 16, and 17. The total score of "similarity" can be obtained by calculating the mean of items 12R, 13, 14, and 15. If participants score higher on the subscales of empowerment and similarity, it indicates that they have more inclusion friendly attitudes towards individuals with intellectual disabilities. On the other hand, if participants score higher on the subscales of exclusion and sheltering, it indicates that they have less inclusion friendly attitudes towards individuals with intellectual disabilities. An example of the empowerment, exclusion, sheltering, and similarity subscales is "People with learning disabilities can plan meetings and conferences without assistance from others", "People who have learning disabilities are a burden on society", "People with learning disabilities should live in sheltered facilities because of the dangers of life in the community", and "People with learning disabilities do not need to make choices about the things they will do each day" respectively. Besides that, an example of the reverse-scored item is "People with learning disabilities should not be allowed to marry and have children".

The Cronbach's alpha for each subscale of CLAS-ID was .75, .78, .64, and .79 for empowerment, exclusion, sheltering, and similarity respectively, which indicated a moderate to good internal consistency (Wilson & Scior, 2015). In the current study, the Cronbach's alpha for each subscale of CLAS-ID was .70, .57, -.21, .71 for empowerment, exclusion, sheltering, and similarity respectively. With respect to the Cronbach's alpha of the sheltering subscale, the negative value may be due to the reason that the high school students were unable to grasp the meaning of one of the items in the sheltering subscale of CLAS-ID. For example, item six in CLAS-ID is "Sheltered workshops for people with learning disabilities are essential". The term "sheltered workshops" is related to work, and it may be irrelevant to high school students. Hence, the meaning of the term may be ambiguous to them, which may

explain the low and negative value of the Cronbach's alpha for the sheltering subscale in the current study. It was noted that alpha may take a negative value if an item has negative discrimination (Cho & Kim, 2015). The 17-item CLAS-ID is a reliable version of the original 40-item version since it is highly correlated with scores originated from the 40-item Community Living Attitudes Scale-Mental Retardation (CLAS-MR) (Henry, Keys, & Jopp, 1999). In the current study, the definition and the term "learning disabilities" was modified to "neurodiversity" or "neurodiverse".

Intellectual Disability Literacy Scale (IDLS). The Intellectual Disability Literacy Scale was developed by (Scior & Furnham, 2011). It was used to assess the general public's knowledge, beliefs, and social distance about intellectual disability, and is suitable for use across different cultures. The questionnaire consists of a vignette that contains a diagnostically unlabelled case story that portrays a person who meets the diagnostic criteria for intellectual disability (American Psychiatric Association, 2013). Also, the questionnaire consists of five sections, namely recognition of the situation portrayed in the vignette, causal and intervention beliefs of participants, social distance, contact, and socio-demographic characteristics of participants. However, in the current study, only the social distance section was used to measure participants' behavioral intention towards neurodiverse students, since other sections of the IDLS were not relevant.

The social distance section of IDLS contains four statements. Examples of these statements include "I would be happy to move next door to someone like James" and "I would be happy to make friends with someone like him". However, several adaptations to these statements were made in the present study, such as "I would be happy to move next door to someone who is neurodiverse" and "I would be happy to make friends with someone like them". Participants were asked to respond to the statements by rating their willingness to

have social contact with people who are neurodiverse by using a 7-point Likert scale ranging from 1 to 7 in which 1 indicates “Disagree Strongly” and 7 indicates “Agree Strongly”. Social distance can be scored by calculating the mean of the four items in which lower scores indicate an increased desire for social distance.

The social distance section of IDLS showed a good internal consistency (α = .87) (Scior & Furnham, 2011). The reliability of the four social distance items was also examined across different ethnic groups and showed good internal consistency (α = .83) (Scior & Furnham, 2011). The Cronbach’s alpha for IDLS in the current study was .75, which indicated a good internal consistency as well. The validity of the social distance of IDLS was measured by using concurrent validity by comparing it to the CLAS-MR and it was found that high social distance scores were positively correlated with CLAS-MR scores for the subscales of exclusion and sheltering, and negatively correlated with the subscales of empowerment and similarity scores. Hence, the social distance part of IDLS was found to have an acceptable concurrent validity (Scior & Furnham, 2011). In the present study, the term “intellectual disability” in the IDLS was modified to “neurodiverse”.

The KOA, CLAS-ID, and IDLS were translated to Mandarin to fit into the context of the participants. For example, “Some students with autism might have trouble talking or expressing themselves” was translated to “一些患有自闭症的学生可能在谈话或表达自己时会遇到困难”; “People with learning disabilities should not be allowed to marry and have children” was translated to “大脑多样性者不应该被允许结婚生子” and the like. A back translation of the questionnaires was also performed to ensure the translated scales were compatible with the original version.

Table 3.3.

Outcome Measures

Outcome Measures	Pre-Test	Post-Test
Knowledge	✓	✓
Attitude	✓	✓
Behavioral Intention	✓	✓

Data Analysis

The data for pre-test and post-test were collected by using the paper-and-pencil method before and after the neurodiversity literacy program. The data were analyzed by using the JASP 0.10.2 software. Wilcoxon's signed rank test was used to analyze the data for pre-test and post-test. It is a nonparametric procedure of a paired t-test (Nahm, 2016). It is used when only one sample is involved to analyze matched-pair data (Woolson, 2008). The Wilcoxon's signed rank test compares the treatment scores of both pre-test and post-test (Nahm, 2016). In order to use the Wilcoxon's signed rank test, the dependent variables should at least be ordinal (Kim, 2014).

The qualitative data were collected by requiring the participants to provide feedback on how they feel about the neurodiversity literacy program and what have they learned throughout the two-day program. The data were analyzed by using thematic analysis by coding the data in which certain statements were interpreted, and then classified into the themes that constituted the phenomena of interest (Nowell, Norris, White, & Moules, 2017). Thematic analysis is a flexible method to identify, analyze, and report themes within the qualitative data. It helps researchers to have an ample amount of detailed data which aids in generating study results (Braun & Clarke, 2006).

Table 3.4.

Data Analytic Plan

Research Question	Hypothesis	Independent Variable	Dependent Variable	Statistical Analysis
What are the effects of a neurodiversity literacy program on Malaysian adolescents' knowledge?	H_0: There is no significant difference in knowledge among the participants between pre-test and post-test. H_1: There is a significant difference in knowledge among the participants between pre-test and post-test.	Neurodiversity literacy program	Knowledge	Wilcoxon's signed rank test
What are the effects of a neurodiversity literacy program on Malaysian adolescents' attitude?	H_0: There is no significant difference in attitude among the participants between pre-test and post-test. H_1: There is a significant difference in attitude among	Neurodiversity literacy program	Attitude	Wilcoxon's signed rank test

	the participants between pre-test and post-test.			
What are the effects of a neurodiversity literacy program on Malaysian adolescents' behavioral intention?	H_0: There is no significant difference in behavioral intention among the participants between pre-test and post-test. H_1: There is a significant difference in behavioral intention among the participants between pre-test and post-test.	Neurodiversity literacy program	Behavioral Intention	Wilcoxon's signed rank test

Chapter 4

Findings and Analysis

In this chapter, the findings and analysis of the effects of a neurodiversity literacy program on participants' knowledge, attitudes, and behavioral intention towards neurodiverse students would be discussed.

Assumptions Check

The assumption check of normality (Shapiro-Wilk) is significant for knowledge and behavioral intention variables, with $p = .032$ and $p = .001$ respectively, suggesting that the pairwise differences are not normally distributed. The assumption for normality has been violated. Thus, all data were analyzed by using non-parametric analysis, Wilcoxon's signed rank test.

Table 4.1.

Test of Normality (Shapiro-Wilk)

		W	*p*
Pre-Knowledge	Post-Knowledge	0.93	0.032
Pre-Empowerment	Post-Empowerment	0.96	0.21
Pre-Exclusion	Post-Exclusion	0.97	0.38
Pre-Sheltering	Post-Sheltering	0.96	0.27
Pre-Similarity	Post-Similarity	0.97	0.41
Pre-Behavioral Intention	Post-Behavioral Intention	0.88	0.001

Note. Significant results suggest a deviation from normality.

Effects of a Neurodiversity Literacy Program on Knowledge

Knowledge. A Wilcoxon's signed rank test indicated that the neurodiversity literacy program significantly increased the participant's knowledge scores (*Mdn* = 8.5) at post-test compared to pre-test (*Mdn* = 8.0) scores, with medium effect size, $W = 342$, $p = .007$, $r_B = .46$.

Table 4.2.

Descriptive Statistics of Knowledge

	Pre-Knowledge	Post-Knowledge
Valid	36	36
Median	8.0	8.5
Minimum	5.0	6.0
Maximum	10.0	10.0
IQR	2.0	2.0

Note. *IQR* = Interquartile range.

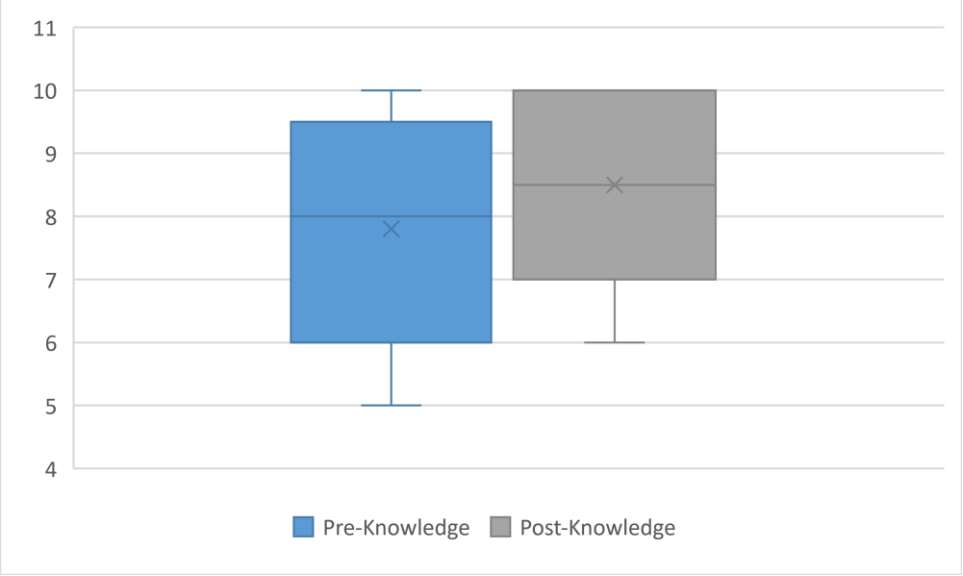


Figure 4.1. Boxplot for knowledge at pre-test and post-test.

Effects of a Neurodiversity Literacy Program on Attitude

Empowerment. A Wilcoxon's signed rank test indicated that the neurodiversity literacy program has no significant effect on the participant's attitude in terms of the empowerment scores (*Mdn* = 4.5) at post-test compared to pre-test (*Mdn* = 4.6) scores, with trivial effect size, $W = 187$, $p = .71$, $r_B = .081$.

Table 4.3.

Descriptive Statistics of Empowerment

	Pre-Empowerment	Post-Empowerment
Valid	36	36
Median	4.6	4.5
Minimum	2.2	3.2
Maximum	5.6	6.0
IQR	0.95	1.0

Note. *IQR* = Interquartile range.

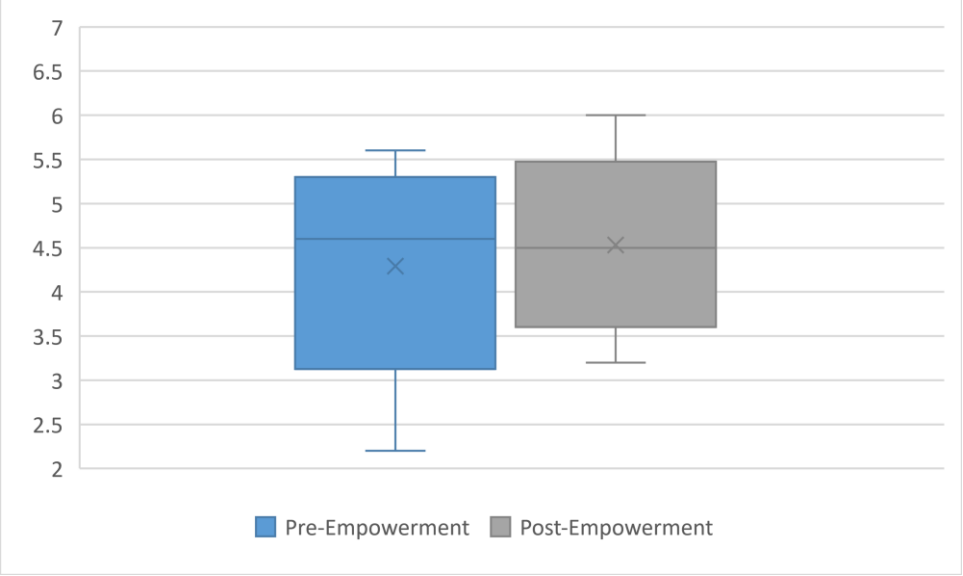


Figure 4.2. Boxplot for empowerment at pre-test and post-test.

Exclusion. A Wilcoxon's signed rank test indicated that the neurodiversity literacy program has no significant effect on the participants' attitude in terms of the exclusion scores (*Mdn* = 1.75) at post-test compared to pre-test (*Mdn* = 1.75) scores, with trivial effect size, $W = 183$, $p = .88$, $r_B = .034$.

Table 4.4.

Descriptive Statistics of Exclusion

	Pre-Exclusion	Post-Exclusion
Valid	36	36
Median	1.75	1.75
Minimum	1.00	1.00
Maximum	3.25	3.00
IQR	1.00	1.00

Note. *IQR* = Interquartile range.

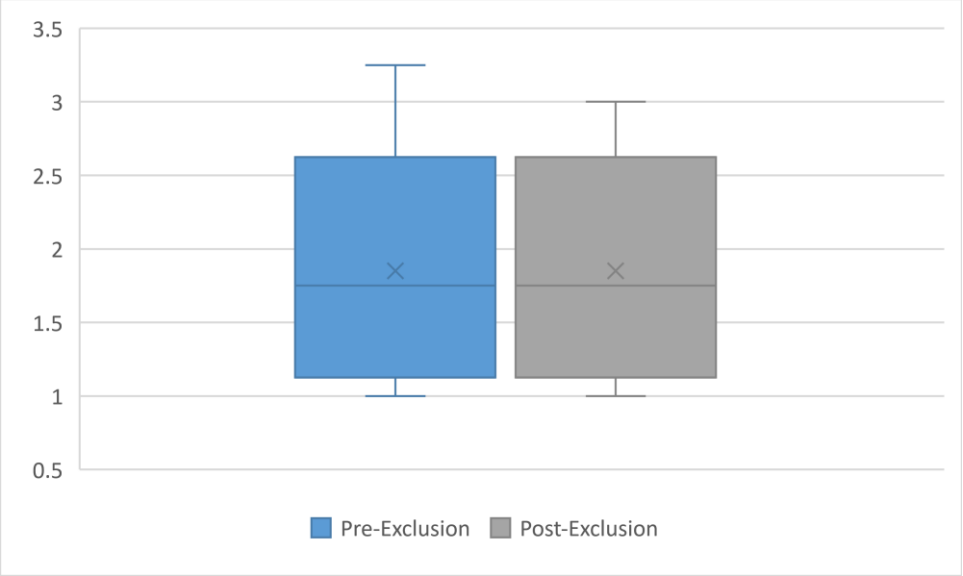


Figure 4.3. Boxplot for exclusion at pre-test and post-test.

Sheltering. A Wilcoxon's signed rank test indicated that the neurodiversity literacy program significantly increased the participants' attitude in terms of the sheltering scores (*Mdn* = 4.00) at post-test compared to pre-test (*Mdn* = 3.75) scores, with large effect size, $W = 132$, $p = .013$, $r_B = .50$.

Table 4.5.

Descriptive Statistics of Sheltering

	Pre-Sheltering	Post-Sheltering
Valid	36	36
Median	3.75	4.00
Minimum	2.33	2.50
Maximum	5.00	5.50
IQR	1.00	1.00

Note. *IQR* = Interquartile range.

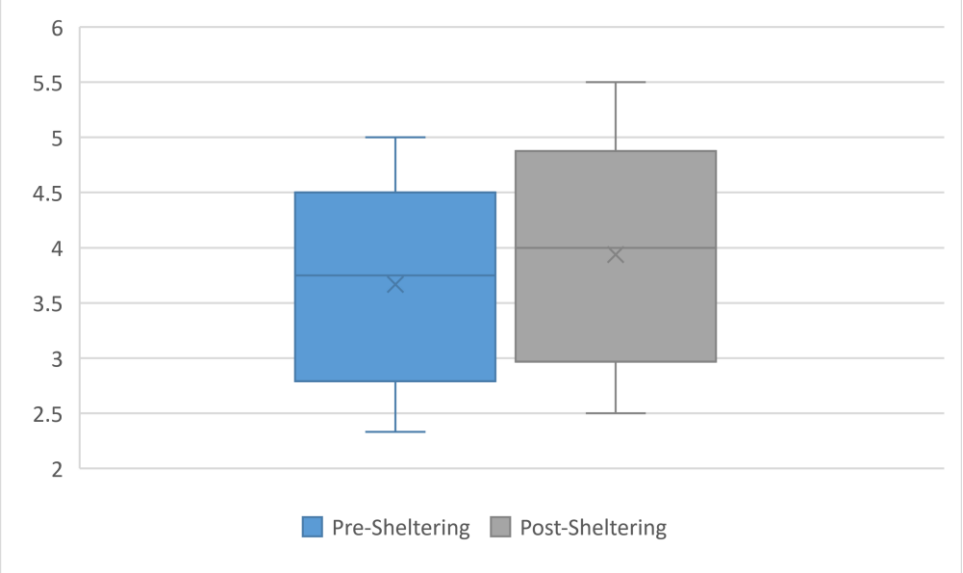


Figure 4.4. Boxplot for sheltering at pre-test and post-test.

Similarity. A Wilcoxon's signed rank test indicated that the neurodiversity literacy program has no significant effect on the participants' attitude in terms of their similarity scores (*Mdn* = 5.25) at post-test compared to pre-test (*Mdn* = 5.38) scores, with medium effect size, $W = 151$, $p = .15$, $r_B = .31$.

Table 4.6.

Descriptive Statistics of Similarity

	Pre-Similarity	Post-Similarity
Valid	36	36
Median	5.25	5.38
Minimum	2.75	3.75
Maximum	6.00	6.00
IQR	1.00	1.00

Note. *IQR* = Interquartile range.

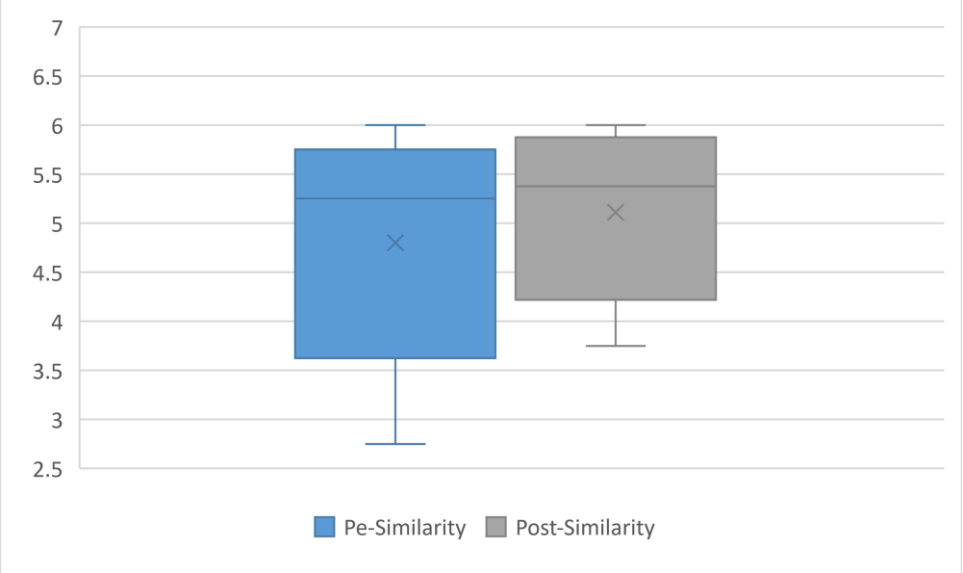


Figure 4.5. Boxplot for similarity at pre-test and post-test.

Effects of a Neurodiversity Literacy Program on Behavioral Intention

Behavioral intention. A Wilcoxon's signed rank test indicated that the neurodiversity literacy program significantly increased the participants' behavioral intention scores (*Mdn* = 2.50) at post-test compared to pre-test (*Mdn* = 3.00) scores, with large effect size, $W = 342$, $p = .007$, $r_B = .57$.

Table 4.7.

Descriptive Statistics of Behavioral Intention

	Pre-Behavioral Intention	Post-Behavioral Intention
Valid	36	36
Median	3.00	2.50
Minimum	1.50	1.00
Maximum	5.75	5.75
IQR	1.00	1.00

Note. *IQR* = Interquartile range.

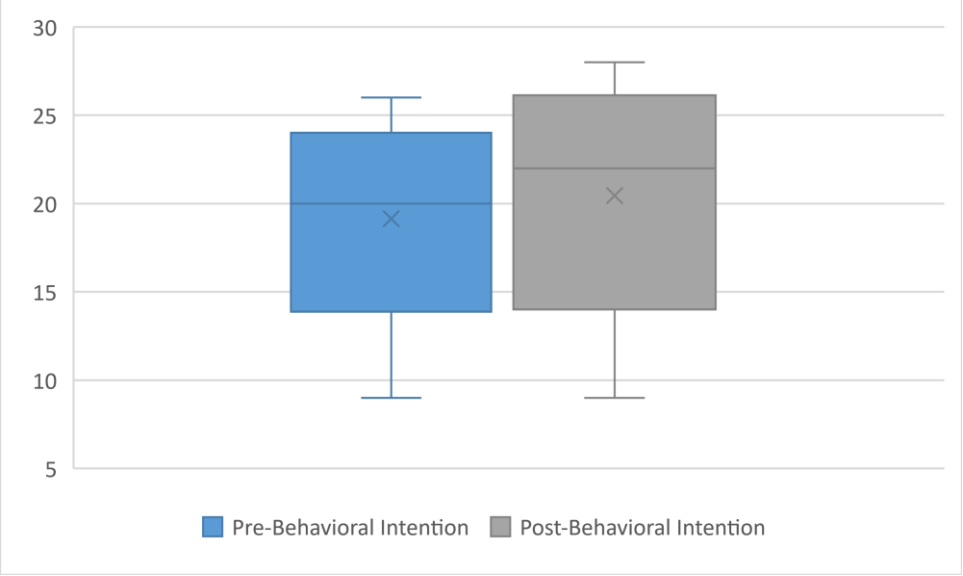


Figure 4.6. Boxplot for behavioral intention at pre-test and post-test.

Qualitative Feedback of Mainstream Students

From the data analysis, the themes generated consisted of: Feasibility, feedback on weakness of program, knowledge, attitude, behavioral intention, and personal growth.

Table 4.8

Frequencies of Responses Based on Themes

Themes	Frequency
Feasibility	14
Feedbacks on Weakness of Program	1
Knowledge	36
Attitude	13
Behavioral Intention	6
Personal Growth	3

Feasibility

In response to research question four, 36% of the participants claimed that the neurodiversity literacy program was practicable in their context by providing positive feedback on the program in the current study. Based on their responses, most of them expressed gratitude and feelings of happiness about how the neurodiversity literacy program was carried out.

> 这两天的活动很特别，希望日后有多一些类似的活动，让更多人认识这些症状向他们伸出援手! [The two-day program was very special, I hope that there will be more similar programs which can be conducted in the near future, to enable people to know more about the symptoms of neurodiversity and to give them a helping hand!] (16 years old female student)

首先，在我没有来到这个活动前，我以为它只是纯粹一个讲座，没想到它有许多游戏和团队合作。所以玩得蛮开心的。 [Firstly, before attending this program, I thought it was just a talk, I did not know that it has many games and activities which require teamwork. Therefore, I had a good time.] (16 years old female student)

“UTAR 的各种游戏很新鲜&有趣，谢谢你们来邀请我们。” [“The variety of games of UTAR is new and interesting, thank you for inviting us.”] (14 years old male student)

The qualitative feedback above indicated that the neurodiversity literacy program was age-appropriate to adolescents as they seemed to enjoy the activities which were included in the neurodiversity literacy program very much. It seemed as if they were not bored by the program since they mentioned that the games and activities in the neurodiversity literacy program were interesting. Besides that, the participants also mentioned that they were happy to learn more in-depth about neurodiversity.

“这两天学到了很多东西，如何帮助大脑多样性者。” [“I have learned a lot in these two days, such as how to help people who are neurodiverse.”] (16 years old male student)

感谢各位小姐姐及老师们来到本校教课。这两天里，我认识许多朋友及学习到了许多知识。希望下次可以再来本校教课。 [Thanks to the facilitators and teachers who came to teach in our school. In this two-day program, I have met a lot of friends and have gained a lot of knowledge. I hope that you will come and teach at our school again.] (17 years old female student)

> 这两天学到了很多，尤其是 3R 法，以后可以用来管理本会的会员。 [I have learned a lot in these two days, especially the 3R method which can be used to manage the members of my society club in the future.] (14 years old male student)

The participants were pleased that the neurodiversity literacy program was able to help them in gaining more knowledge about neurodiversity. Some of them even hope for more similar programs to be done in the future. However, one of the participants gave feedback on the weakness of the program.

> 希望你们可以提出那个 sensory overload 的事不只会发生在患有自闭症的人的身上，因为这个东西其实比想象中还要普遍，见到这种情况时也可以安慰那个人。Some people internalize it, so it can be hard to spot, 我觉得这个可以提出来。Sorry if I sound arrogant. [I hope that you can highlight that sensory overload does not only happen to people with autism, because this is more common than expected, and when it occurs, we could also comfort the person. Some people internalize it, so it can be hard to spot, I think this can be highlighted. Sorry if I sound arrogant.] (16 years old female student)

Despite that some improvements could be made to the neurodiversity literacy program based on the feedback provided by the student; overall, it can be regarded as an age-appropriate and feasible program to improve the knowledge, attitudes, and behavioral intention of the adolescents in Malaysia.

Knowledge

Based on the qualitative feedback of the mainstream students in the current study, the majority of the participants agreed that they were able to benefit from the neurodiversity literacy program, regardless of the weakness of the program. Participants reported that they were able to gain more knowledge about neurodiversity, such as the types of neurodiversity and their respective symptoms.

> 知道了原来不应该在大脑多样性者不适时第一时间去与他有接触而是应该给予他缓冲时间，让他先冷静冷静，避免惊吓他。更了解自闭症，学习障碍，注意力不足过动症，多发性抽动症之间的差别。给予他们更多的同理心及关怀。 [I now understand that when people who are neurodiverse feel uncomfortable, we should not approach them or get in touch with them immediately, we should give them some time to calm themselves to avoid frightening them. I now have a better understanding on the differences among autism spectrum disorder, specific learning disorder, attention deficit hyperactivity disorder, and tics disorder. We should show them more empathy and care.] (16 years old female student)

> 这两天的活动很特别让我对原本没什么接触与了解的自闭症/大脑多样性有了更进一步的了解。 [This two-day program was very special because it makes me understand more about autism or neurodiversity which I used to have little contact with and understanding at first.] (16 years old female student)

> 这两次的活动都很不错，它有让大家都参与在其中并且会有所表现。同时，我也学习到了有关 ‘大脑多样性’的知识；让我知道了，它是什么；如果它发生了，我该怎么面对。（方法） [This two-day program was not bad, it enables everyone to participate and perform themselves in the activities. At the same time, I also gained

knowledge about neurodiversity; it gives me an understanding of what it is and how to confront it when it happens.] (17 years old female student)

Apart from that, participants also reported that they have learned some of the ways to help people who are neurodiverse, such as the 3R strategy to handle a meltdown situation. This improves their ability to deal with people who are neurodiverse in a more effective way.

在他们发作的时候，让他们有时间冷静，别添加噪音，增加他们的负担；切勿让所有人的目光集中在他们身上，造成压迫感，轻声细语安抚他，给他选择。[During their meltdown, allow them to have time to calm down, do not increase the surrounding noise which may increase their burden; do not let everyone focus on them which may cause them to feel pressured, comfort them gently, and allow them to make their own choices.] (16 years old female student)

我在这两天学到了自闭症还有另外一个名字叫大脑多样性。另外，拥有自闭症的人感官特别敏感，如会听到一些常人不会听到的微小声音。因此如果环境过于吵杂，我们可以通过尝试让周围变得更安静或尝试带他到安静的环境来让他冷静下来。 [In this two-day program, I have learned that there is another name for autism which is neurodiversity. Besides that, people with autism have very sensitive senses, such as they tend to hear soft sounds that may not be heard by usual people. Therefore, if the environment is too noisy, we can help them by trying to make the environment quieter or bring them to a quiet place to calm them down.] (14 years old male student)

通过这次的活动，我了解大脑多样性患者在日常生活中会有什么样的表现。以让我在日常生活中能够更加注意这些患者和发生突发情次时安抚他们的方式。同时，我也了解了 3R，既是 regulate, relate, 和 reason，把这个方法善用在生活

> 中，应该可以良好解决问题。[Throughout this program, I have gained an understanding of how people who are neurodiverse express themselves in their daily lives. This allows me to be able to pay more attention to them in my daily life and how to comfort them during an emergency meltdown. At the same time, I have also learned about 3R, which is regulate, relate, and reason. Applying this method, in reality, may help to solve the problem effectively.] (17 years old female student)

Moreover, some of the participants also mentioned that with the knowledge gained from the two-day neurodiversity literacy program, they are now aware that they can actually be friends with people who are neurodiverse in real life.

> 一开始，我完全不了解自闭症。经过这次的活动，我才明白原来我们也是能够与自闭症成为朋友和如果生活中遇到自闭症的人，应该要如何解决等。[At first, I have zero knowledge about autism. After the program, I understand that we can also be friends with people with autism and if we happen to encounter them in real life, I understand how we should help them and so on.] (14 years old female students)

Attitude

Based on the responses of the participants from the qualitative feedback, 33% of the participants indicated that their attitudes changed to more inclusive or positive towards neurodiverse students. The participants claimed that although people who are neurodiverse do have their weaknesses, people should not focus too much on their weaknesses. Instead, they should acknowledge their strengths too. They also expressed their feelings about wanting to accept and include them in their lives and to be more considerate of the condition of neurodiverse people, instead of rejecting or isolating them due to their deficiencies.

其实每个人都有自己的特点，我们不应该去因为大脑多样性患者的 ‘缺陷’而排斥他们。如果我们不了解他们，我们应该要保有同理心，而不是看不起他们，我们也许需要试着去了解他们的情况。[Actually everyone has their uniqueness, we should not reject people who are neurodiverse due to their deficiencies. If we do not understand them, we should have empathy for them, instead of looking down on them, and we may need to try to understand their situation.] (16 years old female student)

大脑多样性者与一般人一样，有长处，也有短处，我们不应该把目光集中在他们的短处，而是应该让他们发挥他们的长处, 当他们被排挤或被他人以异样眼光看待，我们应该站到他们身边，让他们感觉有人与他们同在, 自闭症患者感官特别敏感，对周遭的声音格外敏感，我们应该体谅他们。[People who are neurodiverse have their strengths and weaknesses, just as usual people. We should not focus on their weaknesses, instead, we should focus on enabling them to exert their strengths. When they are being rejected or being viewed differently, we should stand by them, and let them feel that someone is with them. People with autism have very sensitive senses, and they are extremely sensitive to the surrounding sounds, so we should tolerate them.] (16 years old female student)

Participants also stated that people who are neurodiverse deserve to live a happy life rather than being isolated or excluded by others. Thus, they should be treated with more empathy, tolerance, and care, instead of being looked down on by others.

“更不可以看低他们，毕竟每个人都有自己的长处” [“We must not look down on them since everyone has their strengths.”] (16 years old male student)

> 这些特别的孩子们也应该获得和我们同样的生活，没有必要因为他们拥有这些独特的疾病而孤立他们，排挤他们。关爱和包容说起来简单，但做的时候是需要勇气的，关心身边的患者，让他们也拥有快乐，美满的生活。[These special children deserve to live the same life as us, there is no necessity to isolate them just because they have a particular disorder. It is simple to talk about being caring and tolerance, but it needs courage when acting it out, we should care for these people, to let them have a happy and satisfying life too.] (14 years old female student)

Surprisingly, one of the participants mentioned the need to have an open-minded perspective and a non-judgemental view on people who are neurodiverse, according to the qualitative feedback of the participant. The participant emphasized that every person should receive the same treatment regardless of who the person is, and all things should be treated in an equal manner without being influenced by a person's physical characteristics.

> 对待人人都要平等，处事不可因人而异. 每个人出生在这个世界上，都会有不同的性格特点，以客观的角度去看待它，这都是每个人的特色。[To treat people equally, to handle things without varying from person to person. Every person born in this world has different personalities and traits, we should view it in an objective manner, after all these are the uniqueness of all people.] (17 years old female student)

Behavioral Intention

A few participants expressed their willingness to be friends with the neurodiverse students, and to show more concern towards them by helping those who require help. Most importantly, the adolescents mentioned that they wish to let the neurodiverse people know that they are not alone.

“我愿意与他交朋友，让他知道他不是一个人。” [“I am willing to be friends with him/her to let him/her know that he/she is not alone.”] (14 years old female student)

这个活动会让我觉得很想帮助有些困难的人，想要多关怀他们让他们知道他们不是一个人。 [This activity makes me want to help those who are having difficulties and to show more care towards them in order to let them know that they are not alone.] (16 years old female student)

The most surprising aspect of the qualitative data is that several students expressed their intention to join the counselling society as a result of participating in the two-day neurodiversity literacy program, which was mentioned by the school counsellor.

“有学生有兴趣报名参加辅导团体。” [“There are students who are interested to join the counselling society.”] (School counsellor of Chung Ling Private High School)

Based on the behavioral observation of the school counsellor, several students who have participated in the neurodiversity literacy program even showed acceptance towards another student with Asperger’s Syndrome in their class. According to the school counsellor, previously when the student with Asperger’s Syndrome acted in an unusual way, the other students in the class would just endure the student, but now it is obvious that they are starting to accept the student.

我想起昨天发生的一件事作为你们努力的回馈。昨天我在亚斯儿 XX 的班上教历史课。我给同学抄一些笔记，同学边写边聊， 越讲越大声。我就说：同学们，你们是用手写字还是用嘴巴写字的，越讲越大声了！话一说完，XX 走出来拿起一位女同学的笔含在口中，在同学的簿子上写字。我三条汗下来，马上要 XX 吐出铅笔。我看女同学的反应，她眉毛都没挑一下，很平静看 XX。坐在一旁

> 的男同学也是坦然处之。以往来说，这两位同学已经是皱眉不耐地问我他怎么老这样。我跟 XX 说笔已经沾上口水很不卫生要求他拿笔去洗干净。拿回来时女同学点头接过笔放进铅笔盒里，没有嫌弃不耐烦样子。那两位同学都是刚上过工作坊的，明显看出不再是忍耐，而且接纳。 [I suddenly thought of an incident that happened yesterday as a contribution to your hard work. I was teaching history subject in a class in which there was a student named XX who has Asperger's Syndrome. I gave some notes to the students to copy down, they were chit-chatting while writing, and their volume gradually raised. I said: Students, do you write with your hands or your mouth, your voice is getting louder! After that, XX walked out of his seat, took a female student's pen, put it in his mouth, and scribbled on a student's book. I felt worried and immediately asked XX to take the pen out of his mouth. I saw the female student's response, her eyebrows did not move, she watched XX quietly. The male student beside also acted naturally. Previously, these two students would frown their eyebrows and would ask me impatiently why does XX always behave in this way. I told XX that the pen had saliva on it and it was really unhygienic, so I asked him to wash it. When he returned the pen to the female student, the female student nodded her head, took the pen and put it in her pencil case. She did not give him the cold-shoulder and did not show any signs of impatience. The two students have just joined the neurodiversity literacy program, it was obvious that they no longer showed patience, but acceptance.] (School counsellor of Chung Ling Private High School)

In general, the adolescents liked the idea of the neurodiversity literacy program which consisted of a variety of games and activities to allow them to learn more about neurodiversity. Not only did the program increased their awareness and knowledge about

neurodiversity, but several participants also mentioned that it enabled them to know more about themselves, such as their personal strengths and weaknesses. Most importantly, their awareness led them to have the intention to build on their strengths and to improve their weaknesses. Thus, the neurodiversity literacy program is feasible in Malaysian high schools since the adolescents seemed to enjoy themselves a lot in the two-day program.

Chapter 5

Discussion

The current study examined the effects of a neurodiversity literacy program on the knowledge, attitude, and behavioral intention of the mainstream students towards neurodiverse students. It was hypothesized that all three variables would have a difference between pre-test and post-test as a result of engaging in the neurodiversity literacy program. Findings of the present study indicated that the knowledge and behavioral intention among mainstream students significantly increased, whereas the attitudes of mainstream students did not significantly change, which was an unanticipated finding. The qualitative results of knowledge validated the quantitative findings, while the qualitative results of attitude and behavioral intention were inconsistent with the quantitative findings.

Effects of a Neurodiversity Literacy Program on Knowledge of Mainstream Students

The results of the current study indicated that the neurodiversity literacy program significantly increased the mainstream students' knowledge based on the comparison of pre-test and post-test as hypothesized. In accordance with the present results, a similar result was also reported in several past studies examining the effectiveness of a neurodiversity literacy program on adolescents' knowledge (Brook & Boaz, 2006; Gus, 2000; Holtz & Tessman, 2007; Mavropoulou & Sideridis, 2014; Swaim & Morgan, 2001). This result was also supported by the qualitative feedback of the participants as the majority of them claimed that they have gained knowledge about what is neurodiversity, the respective symptoms, and the appropriate ways to help people who are neurodiverse more effectively.

There are a handful of possible explanations for this result. A prior study noted that participants are able to gain more information and understanding towards neurodiversity as a result of participating in a neurodiversity literacy program, which may lead to a significant increase in their knowledge from pre-test to post-test (Gus, 2000). Another possible reason for the increment in participants' knowledge may be due to the content delivered in the neurodiversity literacy program and the mode of delivery of the neurodiversity literacy program was appropriate to the participants. For example, talks, group discussions, games, role plays, and first-hand experiences were included as a series of activities in the neurodiversity literacy program to enhance the participants' knowledge more effectively. It was also suggested that participants' knowledge tends to increase as a result of participating in talks and discussions, which were included in the neurodiversity literacy program (Brook & Boaz, 2006).

Besides that, the neurodiversity literacy program in the current study presented a couple of videos on sensory overload and symptoms of ADHD to the participants. The reason for this was to allow the participants to know more about ADHD and what it is like to experience sensory overload. Therefore, this method of delivering the content may have left the participants with a significant impact and impression, which may lead to an increase in the participants' knowledge. First-hand experiences allow the participants to experience and attempt to react to an unpleasant situation, to endure the consequences, or to internalize something (Hansen, 2000). If participants are given the opportunity to relate their experiences to a situation, they are able to learn more effectively (Hansen, 2000). Thus, this explains why first-hand experiences play an important role in the process of learning new information or knowledge. It has also been suggested that knowledge can be easily improved even through a simple or brief intervention, such as a video intervention (Holtz & Tessman, 2007). Regardless of whether the video contained any explanatory information about neurodiversity,

participants' knowledge would still increase as long as the video shown to the participants contained information about neurodiversity such as the symptoms of ADHD without explanation to it (Swaim & Morgan, 2001). Hence, this may explain the significant increase in participants' knowledge about neurodiversity as a result of the video-viewing sessions in the neurodiversity literacy program.

Effects of a Neurodiversity Literacy Program on Attitudes of Mainstream Students

The second research question in the present study was to identify the effects of a neurodiversity literacy program on Malaysian adolescents' attitudes. Surprisingly, the current results indicated a significant change in the sheltering subscale of CLAS-ID at post-test, whereas there was no significant change in empowerment, exclusion, and similarity subscales of CLAS-ID at post-test. This finding is inconsistent with previous studies which noted that the intervention program was found to be effective in improving the mainstream students' attitudes towards neurodiverse students (de Boer et al., 2014; Gus, 2000; Holtz & Tessman, 2007; Mavropoulou & Sideridis, 2014). Interestingly, according to the qualitative feedback of the participants, they seemed to adopt a positive attitude towards neurodiverse people after joining the neurodiversity literacy program. In this case, the participants mentioned that empathy and tolerance are two important elements to facilitate an inclusive attitude towards neurodiverse people, instead of rejecting them in real life.

Based on the quantitative data, although no significant changes were found on adolescents' attitudes as a result of engaging in the neurodiversity literacy program, the qualitative data indicated that there was a change in attitude among 33%, a significant minority of the participants. Among these participants, they emphasized the need to have a positive and inclusive attitude towards neurodiverse people. Despite that there were only 33%

of the participants noted the importance of having a positive attitude towards neurodiverse people, it shall not be concluded that the neurodiversity literacy program did not have an effect on the participants' attitudes. There may also be a possibility that participants did not provide their feedback regarding their attitudes towards people who are neurodiverse in the qualitative feedback.

In this study, it was found that there was a significant change in participants' attitudes in terms of sheltering at post-test. Although a higher score of the sheltering subscale indicated a more negative or less inclusive-friendly attitude towards people who are neurodiverse, past studies have noted that the idea of sheltering people who are neurodiverse may be understood differently by individuals of different social and cultural backgrounds (Su, Cuskelly, Gilmore, & Sullivan, 2015). For example, the sheltering subscale may be interpreted as a negative attitude in which participants recognize neurodiverse people to have the inability to live alone, to make decisions on their own, and to take care of themselves. On the other hand, the sheltering subscale may also be interpreted as a protective attitude in which the participants recognize people who are neurodiverse to be worthy of others' care and concern (Horner-Johnson et al., 2002), especially in Chinese culture. This is due to the belief of Chinese that the government and society hold the responsibility to provide protection and support to people who are neurodiverse (Su et al., 2015). For example, numerous sheltered institutions such as special schools and welfare enterprises have been established to provide care to those who are neurodiverse in Chinese cultures (Deng, Poon-Mcbrayer, & Farnsworth, 2001; Huang, Guo, & Bricout, 2008). In the current study, according to the qualitative feedback, the participants also reported that they feel the need to provide support to the neurodiverse students by providing care and assistance to them in their daily lives. The participants may have formed protective attitudes rather than negative attitudes towards the neurodiverse

students as a result of participating in the neurodiversity literacy program. Thus, this may explain the changes in participants' attitudes in terms of sheltering at post-test.

In contrast to the findings of earlier studies; however, only a little evidence of improvements in participants' attitudes as an outcome of involving in the neurodiversity literacy program was detected. This may be due to the duration of the neurodiversity literacy program in the present study which lasted for only two hours per day for two days. The short duration may not be effective enough to bring a significant change in the participants' attitudes immediately after the neurodiversity literacy program. It was suggested that participants who attended a longer intervention program showed more positive attitudes than those who attended a shorter intervention program (Rillotta & Nettelbeck, 2007). Similarly, empathy as an attitude requires an intervention program that consists of a longer period to have a continuing impact on the participants due to the reason that empathy requires a large amount of time to develop (Schacter, Addis, & Buckner, 2008). This was evident in past findings which found that the neurodiversity literacy program which involved more than one session was more effective to bring a change in participants' attitudes. For example, participants who attended a six-day or an eight-session intervention program showed more positive attitudes towards neurodiverse people as compared to those who attended a one-day or three-session intervention program (Reina, Lopez, Jimenez, Garcia-Calvo, & Hutzler, 2011; Rillotta & Nettelbeck, 2007). Thus, the duration of the neurodiversity literacy program in the current study may be too short to bring a change in the adolescents' attitude.

Another possible explanation for this finding is that adolescents may already form an existing positive or negative attitude towards the neurodiverse students through prior experiences or information as they age; therefore, it is difficult to change their attitude in a short period. Past studies have supported this notion that attitudes of typically developing

students may become more negative as they age (Campbell, Ferguson, Herzinger, Jackson, & Marino, 2004; Ryan, 1981). It seems possible that this finding is due to the reason that students may have gained greater knowledge and experiences through their exposure with people who are neurodiverse, and they may have developed a positive or a negative attitude towards their peers who are neurodiverse as they grow older. As a result, it would be difficult to change their current attitudes towards neurodiverse students (Lochner, 2019). Hence, modifications to the content of the current neurodiversity literacy program may need to be done to change or improve the attitudes of the participants.

Moreover, the discrepancy between the findings of the current study and past studies may be explained by the reason that the current study did not involve neurodiverse students in the neurodiversity literacy program. Besides that, there was also a lack of activities for improving participants' attitudes towards the neurodiverse students. It was claimed that mainstream students would develop more positive attitudes towards neurodiverse students if they receive adequate information and exposure to people who are neurodiverse (Rillotta & Nettelbeck, 2007). Based on the contact theory (Allport, 1954), stereotype and prejudice among in-groups towards out-groups may be reduced through contact between one another. Accordingly, the theory postulates that an individual's positive attitude towards people who are neurodiverse can be formed through favourable contact with one another, while an individual's negative attitude towards people who are neurodiverse can also be formed through unfavourable contact or no contact at all with one another (Mavropoulou & Sideridis, 2014). This is evident in a past study that found out that involving neurodiverse students in the neurodiversity literacy program increased mainstream students' contact with them, which then led to an improvement in their empathy towards neurodiverse students (Mavropoulou & Sideridis, 2014; Schacter et al., 2008). It can thus be suggested that adolescents' attitudes can

be enhanced if they have exposure to the neurodiverse students, instead of sole participation in the neurodiversity literacy program.

Effects of a Neurodiversity Literacy Program on Behavioral Intention of Mainstream Students

With respect to the third research question, it was found that mainstream students' behavioral intention towards neurodiverse students showed a statistically significant difference between pre- and post-intervention. Comparison of the findings of the present study with those of other studies confirmed that the behavioral intention of typically developing students towards special needs students can be improved through intervention programs (e.g. Johnson, 2018; Lochner, 2019; Silton & Fogel, 2012). However, of all the qualitative feedback of the participants, only a few participants expressed their willingness to accept the neurodiverse students as their friends and to help them when they encounter any difficulties in life.

This may be due to the reason that the participants were only requested to write down their thoughts and what they have learned throughout the neurodiversity literacy program as their qualitative feedback. Thus, the majority of them did not include their feedback in terms of their behavioral intention towards the neurodiverse students. However, based on the behavioral observation of the school counsellor, there was once when a neurodiverse student acted in a socially undesirable way during class, a few students who have gone through the neurodiversity literacy program started to show acceptance towards the neurodiverse student, instead of solely being patient and tolerant with the neurodiverse student's unusual behavior. Therefore, the neurodiversity literacy program did have a positive impact on the adolescents' behavioral intention, despite the inconsistency between the qualitative and quantitative findings.

A possible explanation for the findings of quantitative data may be due to the neurodiversity literacy program in the present study provided explanations to the participants regarding the reasons why some neurodiverse students reacted in socially undesirable ways towards certain stimuli and that it is a neurodevelopmental disorder. Hence, it increased the participants' understanding that the uncommon behaviors of neurodiverse students are due to their different structures in the brain as compared to the mainstream students, which in turn increased their willingness to include neurodiverse students in social activities. Johnson (2018) supported this notion by claiming that if the intervention program managed to increase the mainstream students' knowledge of why neurodiverse students behave atypically, they may have imagined the negative behaviors of neurodiverse students in the conditions in which they were asked about their behavioral intention towards neurodiverse students while responding to the questionnaires. For example, if a typically developing student has inadequate knowledge about the atypical behaviors of a student with ASD, the typically developing student may have been unwilling to study with the student with ASD. This is because the typically developing student may find the student with ASD to be disturbing with their repetitive movements.

Besides that, the neurodiversity literacy program in the current study also provided information about the appropriate ways of helping neurodiverse students to perform better. This may give the mainstream students an idea of how they can help the neurodiverse students when they encounter situations in which they were unsure of how to respond to. When they are equipped with this knowledge, they may have more control over their behavior and the belief that they are able to offer help to the neurodiverse students. This explanation is derived from the theory of planned behavior that the neurodiversity literacy program may enhance the participants' perceived behavioral control or self-efficacy, which may lead to a direct change in their behavioral intention towards special needs students

(Webb & Sheeran, 2006). Instead of just providing explanatory or descriptive information to the participants, peer strategies which provide a dynamic skill-set of what general education students can do and how they can respond to the special needs students would be more effective in motivating them to be more willing to socially interact with the special needs students (Silton & Fogel, 2012). This is because they learned about the proper ways to interact with the neurodiverse students; thus, they may change their previous expectancies and behavioral intention towards the neurodiverse students (Silton & Fogel, 2012).

In general, therefore, the findings of the current study contribute to the literature of the neurodiversity literacy program. Majority of the earlier studies examining the effects of a neurodiversity literacy program were found to have positive outcomes on all three variables, which are the knowledge, attitude, and behavioral intention of typically developing students (de Boer et al., 2014; Mavropoulou & Sideridis, 2014; Silton & Fogel, 2012). Findings of the present study broadly support the work of previous studies such that the neurodiversity literacy program significantly improved the knowledge and behavioral intention of the typically developing students. However, contrary to expectations and previous studies, the present study only found a significant difference in the attitudes of the typically developing students in terms of sheltering between pre-intervention and post-intervention, while there was not a significant difference in their attitudes in terms of empowerment, exclusion, and similarity between pre-intervention and post-intervention. In conclusion, this study has shown that the neurodiversity literacy program was effective in enhancing the knowledge and behavioral intention of Malaysian adolescents. However, this program was effective in improving the attitudes of Malaysian adolescents only to some extent.

Implications of the Study

The qualitative and quantitative results of the current study have contributed several implications under the theoretical and practical aspects. In terms of the theoretical aspect, according to the theory of planned behavior, it was suggested that more knowledge would predict a change in attitude, which in turn leads to a change in behavioral intention. The current study partially supported the theory with the preliminary evidence that a brief neurodiversity literacy program had an impact on mainstream students' knowledge and behavioral intention, but it only had an effect on mainstream students' attitude to a certain extent since there was not a significant difference in participants' attitude between pre-intervention and post-intervention based on quantitative findings. To date, limited studies are examining the effects of a neurodiversity literacy program on the knowledge, attitudes, and behavioral intention of adolescents in Malaysia. As a result, there is also a lack of literature to support the findings of the current study in the Malaysia context. Hence, the current findings serve as a basis for future research to expand the evidence on the theory of planned behavior by examining changes in knowledge, attitudes, and behavioral intention among the adolescents in Malaysia context.

In terms of the practical aspect, the results of the current study may contribute to the facilitation of inclusive education in Malaysia. In order to achieve this, it is important to raise the awareness of neurodiversity by increasing the mainstream students' knowledge towards neurodiversity. An explanation for this is a lack of knowledge and awareness of neurodiversity may influence individuals to have a negative attitude and behavior towards neurodiverse people (Lee, Ong, Lee, & Fairuz, 2017), such as negative stereotyping and bullying. Therefore, the current study may serve as a reference for schools to include the neurodiversity literacy program as a part of the school curriculum. Although the results of

this study indicated that the neurodiversity literacy program may not have a significant effect on mainstream students' attitudes, it is therefore suggested that attitude takes time to change or develop. Thus, instead of just participating in a two-day neurodiversity literacy program, students have the opportunity to learn or be exposed to more information about neurodiversity in the classroom, which may foster the acceptance of neurodiverse students among the typically developing students. Inclusive education does not simply mean including neurodiverse students in the general education classroom, but accepting them as the in-group resembles the main idea of inclusive education. Thus, when mainstream students are willing to accept them, the facilitation of inclusive education can be achieved.

Moreover, this study would prove useful in the development of the research into the Peer Buddy Program (PBP) in the Malaysia context. Research into PBP has not been extensive in Malaysia. This may be partly due to the lack of knowledge as well as the inappropriate attitude and behavior of mainstream students towards special needs students, which leads to the perception that PBP may not be feasible in Malaysia. Hence, the current study lays the groundwork for future studies into PBP in Malaysia. With sufficient research done on PBP to determine the proper protocols, procedures, and methods to run the PBP, it may contribute to the Malaysian government's plan to implement the PBP in all mainstream schools (MOE, 2013), which has not been executed up until today.

Lastly, the current study also contributed to the Zero Reject Policy dated on 2018 December 26 and in the circular letter KPM. 100-6/1/25 Jld. 13(16) by the Ministry of Education Malaysia. This policy was also consistent with the statement released by the Minister of Education Malaysia, Dr. Maszlee Malik, who addressed the issue of equality in education which is needed to be received by all students, including those who are neurodiverse (Shaari, 2018). Referring to the first practical implication of this study as

mentioned above, inclusive education ensures all students receive the same educational opportunities, and the idea of running PBP in mainstream schools may also assist the special needs students to adapt themselves to mainstream schools. Therefore, the current study may also partly achieve the fourth goal of the Sustainable Development Goal (SDG) by the United Nations (2015) to guarantee an equal quality of education and a fair amount of lifelong opportunity for everyone, regardless of their mental ability. Precisely, goal 4.5 which aims to provide equal access to all levels of education and vocational training to everyone, including people with disabilities despite the gender difference. Along with goal 4.A which carries the aim of constructing and enhancing the educational facilities which are able to meet the needs of both gender, children, and people with disabilities as well as to provide an environment that is safe, non-violence, and inclusive for everyone to learn effectively (United Nations, 2015). Taken together, the results of the present study have a theoretical implication and a number of practical implications.

Limitations of the Study

There are several limitations that are important to be acknowledged which may influence the findings of the current study. First, the major limitation of this study is the lack of a control group since the single-arm trial research design was adopted in this study. Thus, it may be unable to ascertain the positive outcomes in knowledge and behavioral intention of the participants were indeed a direct effect of the neurodiversity literacy program.

Second, the generalizability of the current findings is subject to certain limitations. For example, all the participants recruited from the current study were Chinese high school students from a private high school in Penang. Therefore, the results of the current study may be unable to generalize to the target population in Malaysia, and it may only be generalized to

Chinese adolescents. Furthermore, this applies to those whose parents could afford the high tuition fees which are imposed by Chinese independent schools (Siah, Ong, Tan, Sim, & Thoo, 2017).

Third, one of the weaknesses in the current study which could have influenced the measurements of participants' knowledge of autism and their attitudes towards neurodiverse students was the psychometric properties of the adopted scales in the current study. For instance, the KOA scale indicated a low Cronbach alpha in the past and current study, which raises the question of the reliability of the scale. Another psychometric issue found was item number six of the sheltering subscale of CLAS-ID which may not be relevant to the participants. In consideration of the adolescents' age, they may not comprehend the term "sheltered workshops".

Fourth, the finding was limited by the absence of behavioral observation of the adolescents' actual behavior towards neurodiverse students. Thus, to some extent, adolescents' self-report behavioral intentions may not reflect their actual behavior in reality. It is unable to determine whether the neurodiversity literacy program had an actual impact on their behavior.

Fifth, it is unfortunate that this study did not assess participants' personal experiences with neurodiverse people which may have influenced their attitudes. With this, the study lacked information on whether participants have had experiences in dealing with neurodiverse people, which may be helpful in identifying whether their changes in attitude were an impact of the neurodiversity literacy program.

Lastly, being limited to the duration of the neurodiversity literacy program, the two-day program may be too brief and short in order to have a lasting impact on adolescents' knowledge, attitude and behavioral intention towards neurodiverse students. According to the findings of several past studies, it was suggested that a longer duration of the neurodiversity

literacy program would be more effective to yield a significant change on adolescents' knowledge, attitude, and behavioral intention (Lindsay & Edwards, 2012; Rillotta & Nettelbeck, 2007; Schacter, Addis, & Buckner, 2008).

Recommendations for Future Research

The current pilot study provided evidence on the feasibility of a neurodiversity literacy program in improving the knowledge, attitudes, and behavioral intention of typically developing students towards neurodiverse students in Malaysia. Considerably more research using a randomized controlled trial will need to be conducted in Malaysia to determine the effectiveness of the neurodiversity literacy program. In this case, a larger sample size may need to be included as well to randomized the participants into experimental and control groups.

Second, it is recommended that more research using a probability sampling method should be done to prevent any bias. With this, the results may be generalized to the target population, since samples which were chosen using a probability sampling method represent more to the target population (Mohamed & Ahmed, 2017).

Third, the issue of the psychometric properties of the scales in the current study calls for the development and validation of a new scale to assess knowledge of autism in order to improve the reliability and content validity of the scale in future studies.

Fourth, behavioral observation is recommended to be included in future research. A focus on the typically developing students' actual behavior towards the neurodiverse students could produce interesting findings on whether their self-reported behavioral intention truly reflects their actual behavior. Besides that, it can also be used to determine whether a

neurodiversity literacy program is effective in fostering a good practice among the typically developing students towards neurodiverse students.

Fifth, further studies regarding the role of participants' personal experience with neurodiverse people on their attitudes towards neurodiverse people would be worthwhile. There may be a need to assess whether participants' personal experience with neurodiverse people would yield a different result than the current study in terms of participants' attitudes towards the neurodiverse people.

Sixth, further research could usefully explore whether a longer duration of a neurodiversity literacy program would be more effective to improve the knowledge, attitudes, and behavioral intentions of the mainstream students in Malaysia, especially their attitude towards the neurodiverse students.

Lastly, further research in this field would be of great help by adopting the whole-school approach in mainstream schools in Malaysia. The whole-school approach emphasizes on promoting students' emotional, social, spiritual, and physical well-being (Weare & Markham, 2005). For example, intervention programs designed based on a whole school approach may aim to enhance the cognitive, affective, and behavioral aspects of students' development, and to encourage empathy among one another. Hence, it is important to create a "caring classroom environment" to promote students' understanding of others. This may be achieved through students' engagement in co-operative and helping activities, the use of appropriate discipline methods by teachers to convey prosocial norms and values, positive role modelling by teachers, and the utilization of role-plays, games, and stories (Wells, Barlow, & Stewart-Brown, 2003). Therefore, it is recommended that future research should work on designing an intervention program based on the whole school approach to improve

the attitudes and behavioral intentions of the mainstream students' towards neurodiverse students in Malaysia.

References

Adams, D. (2016, November). *The effectiveness of the buddy support system in special education in Malaysia*. Paper presented at International Conference on Teacher Learning and Development (ICTLD), Penang, Malaysia. Retrieved from https://www.researchgate.net/publication/320442550_THE_EFFECTIVENESS_OF_THE_BUDDY_SUPPORT_SYSTEM_IN_SPECIAL_EDUCATION_IN_MALAYSIA

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice- Hall.

Ajzen, I. (1985). From intentions to actions: A Theory of Planned Behavior. In J. Kuhl & J. Beckmann (Eds.), *Action-control: From cognition to behavior* (pp. 1l-39). Heidelberg: Springer.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Processes, 50*(2), 170-211. https://doi.org/10.1016/0749-5978(91)90020-T

Allport, G. W. (1954). *The nature of prejudice*. Retrieved from https://archive.org/details/TheNatureOfPrejudice/page/n83

Alqahtani, R. (2015). High school peer buddy program: Impact on social and academic achievement for students with disabilities. *European Journal of Educational Sciences, 2*, 1-16. Retrieved from https://www.researchgate.net/publication/301675784_HIGH_SCHOOL_PEER_BUDDY_PROGRAM_IMPACT_ON_SOCIAL_AND_ACADEMIC_ACHIEVEMENT_FOR_STUDENTS_WITH_DISABILITIES

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. Washington, DC: Author.

Birkett, M. A., & Day, S. J. (1994). Internal pilot studies for estimating sample size. *Statistics in Medicine, 13*(23-24), 2455-2463. https://doi.org/10.1002/sim.4780132309

Bless, G., & Amrein, C. (1992). The integration of pupils with learning difficulties: The results of research into the effects of integration. *European Journal of Special Needs Education, 7*(1), 11-19. doi:10.1080/0885625920070102

Blundell, R., Das, R., Potts, H., & Scior, K. (2015). The association between contact and intellectual disability literacy, causal attributions and stigma. *Journal of Intellectual Disability Research, 60*(3), 218–227. doi:10.1111/jir.12241

Bossaert, G., Colpin, H., Pijl, S. J., & Katja, P. (2011). The attitudes of Belgian adolescents towards peers with disabilities. *Research in Development Disabilities, 32*(2), 504-509. https://doi.org/10.1016/j.ridd.2010.12.033

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. doi:10.1191/1478088706qp063oa

Brook, U., & Boaz, M. (2006). Attitude and knowledge of high school pupils towards adolescents with special needs (Tourette's syndrome). *Indian Journal of Pediatrics, 73*(12), 1099-1104. doi:10.1007/BF02763054

Brown, H. K., Ouellette-Kuntz, H., Lysaght, R., & Burge, P. (2011). Students' behavioural intentions towards peers with disability. *Journal of Applied Research in Intellectual Disabilities, 24*(4), 322-332. doi:10.1111/j.1468-3148.2010.00616.x

Browne, R. H. (1995). On the use of a pilot sample for sample size determination. *Statistics in Medicine, 14*(17), 1933-1940. doi:10.1002/sim.4780141709

Campbell, J. M., Ferguson, J. E., Herzinger, C. V., Jackson, J. N., & Marino, C. A. (2004). Combined descriptive and explanatory information improves peers' perceptions of

autism. *Research in Developmental Disabilities, 25*(4), 321-339. doi:10.1016/j.ridd.2004.01.005

Campbell, J. M. (2006). Changing children's attitudes toward Autism: A process of persuasive communication. *Journal of Developmental and Physical Disabilities, 18*(3), 251-272. doi:10.1007/s10882-006-9015-7

Campbell, J. M., & Barger, B. D. (2011). Middle school students' knowledge of autism. *Journal of Autism and Developmental Disorders, 41*(6), 732-740. doi:10.1007/s10803-010-1092-x

Carter, E. W., Cushing, L. S., Clark, N. M., & Kennedy, C. H. (2005). Effects of peer support interventions on students' access to the general curriculum and social interactions. *Research & Practice for Persons with Severe Disabilities, 30*(1), 15-25. doi:10.2511/rpsd.30.1.15

Carter, C. (2013). The age of strategy: Strategy, organizations and society. *Business History, 55*(7), 1047-1057. doi:10.1080/00076791.2013.838030

Cho, E., & Kim, S. (2014). Cronbach's coefficient alpha: Well known but poorly understood. *Organizational Research Methods, 18*(2), 207-230. doi:10.1177/1094428114555994

Cummins, R. A., & Lau, A. L. D. (2003). Community integration or community exposure? A review and discussion in relation to people with an intellectual disability. *Journal of Applied Research in Intellectual Disabilities, 16*(2), 145–157. https://doi.org/10.1046/j.1468-3148.2003.00157.x

Data.gov.my. (2018). *Statistik murid berkeperluan khas masalah pembelajaran di program pendidikan inklusif menengah mengikut negeri dan jenis kurang upaya* [Set data]. Diperolehi dari http://www.data.gov.my/data/en_US/dataset/statistik-mbk-masalah-

pembelajaran-di-ppi-menengah-ikut-negeri-dan-jenis-kurang-upaya/resource/8045aa2f-534a-4cb0-932f-dc449bafb0f2

de Boer, A., Pijl, S. J., Minnaert, A., & Post, W. (2014). Evaluating the effectiveness of an intervention program to influence attitudes of students towards peers with disabilities. *Journal of Autism and Developmental Disorders, 44*(3), 572-583. doi:10.1007/s10803-013-1908-6

Deng, M., Poon-Mcbrayer, K. F., & Farnsworth, E. B. (2001). The development of special education in China: A sociocultural review. *Remedial and Special Education, 22*, 288–298. doi:10.1177/074193250102200504

Diamond, K. E., Hestenes, L. L., Carpenter, E. S., & Innes, F. K. (1997). Relationships between enrollment in an inclusive class and preschool children's ideas about people with disabilities. *Topics in Early Childhood Special Education, 17*(4), 520-536. http://dx.doi.org/10.1177/027112149701700409

Dore, R., Dion, E., Wagner, S., & Brunet, J. P. (2002). High school inclusion of adolescents with mental retardation: A multiple case study. *Education and Training in Mental Retardation and Developmental Disabilities, 37*(3), 253–261. Retrieved from https://www.jstor.org/stable/23880003

Evans, S. R. (2010). Clinical trial structures. *Journal of Experimental Stroke and Translational Medicine, 3*(11), 8-18. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3059315/

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and researc*h. Retrieved from https://people.umass.edu/aizen/f&a1975.html

Foster, K. (2011). *Using a peer buddy system to increase interaction between students with special needs and their peers*. (Doctoral dissertation). Retrieved from https://rdw.rowan.edu/etd/257/

Friedrich, S., Morgan, S. B., & Devine, C. (1996). Children's attitudes and behavioral intentions toward a peer with Tourette Syndrome. *Journal of Pediatric Psychology, 21*(3), 307-319. doi:10.1093/jpepsy/21.3.307

Gash, H., & Coffey, D. (1995). Influences on attitudes towards children with mental handicap. *European Journal of Special Needs Education, 10*(1), 1-16. doi:10.1080/0885625950100101

Gray, D. E. (1993). Perceptions of stigma: The parents of autistic children. *Sociology of Health and Illness, 15*(1), 102-120. doi:10.1111/1467-9566.ep11343802

Griffin, E., & Pollak, D. (2009). Student experiences of neurodiversity in higher education: Insights from the BRAINHE project. *Dyslexia, 15*(1), 23–41. doi:10.1002/dys.383

Gus, L. (2000). Autism: Promoting peer understanding. *Educational Psychology in Practice: Theory, Research and Practice in Educational Psychology, 16*(4), 461-468. doi:10.1080/713666109

Hansen, R. E. (2000). The role of experience in learning: Giving meaning and authenticity to the learning process in schools. *Journal of Technology Education, 11*(2), 23-32. doi:10.21061/jte.v11i2.a.2

Henry, D., Keys, C., & Jopp, D. (1999). *The Community Living Attitudes Scale, Mental Retardation version: Reference manual*. Chicago: Univ. of Illinois at Chicago.

Hochman, J. M., Carter, E. W., Bottema-Beutel, K., Harvey, M. N., & Gustafson, J. R. (2015). Efficacy of peer networks to increase social connections among high school students

with and without autism spectrum disorder. *Exceptional Children, 82*(1), 96-116. https://doi.org/10.1177/0014402915585482

Hogan, A., McLellan, L., & Bauman, A. (2000). Health promotion needs of young people with disabilities: A population study. *Disability and Rehabilitation, 22*(8), 352–357. https://doi.org/10.1080/096382800296593

Holtz, K. D., & Tessman, G. K. (2007). Evaluation of a peer-focused intervention to increase knowledge and foster positive attitudes toward children with Tourette Syndrome. *Journal of Developmental and Physical Disabilities, 19*(6), 531-542. doi:10.1007/s10882-007-9042-z

Horner-Johnson, W., Keys, C., Henry, D., Yamaki, K., Oi, F., Watanabe, K., … Fugjimura, I. (2002). Attitudes of Japanese students toward people with intellectual disability. *Journal of Intellectual Disability Research, 46(5), 365–378.* doi:10.1046/j.1365-2788.2002.00406.x

Huang, J., Guo, B., & Bricout, J. C. (2008). From concentration to dispersion: The shift in policy approach to disability employment in China. *Journal of Disability Policy Studies, 20*, 46–54. doi:10.1177/1044207308325008

Jaarsma, P., & Welin, S. (2011). Autism as a natural human variation: Reflections on the claims of the neurodiversity movement. *Health Care Analysis, 20*(1), 20–30. doi:10.1007/s10728-011-0169-9

Jabatan Kebajikan Masyarakat. (2016). *Laporan statistik Jabatan Kebajikan Masyarakat 2016*. Diperolehi dari http://www.jkm.gov.my/jkm/uploads/files/penerbitan/Buku%20statistik%202016.pdf

Johnson, S. E. (2018). *Examining the effects of a knowledge-based intervention about Autism Spectrum Disorder on the knowledge, empathy, and conative attitudes of typically developing students*. (Doctoral dissertation). Retrieved from https://prism.ucalgary.ca/handle/1880/106757

Julious, S. A. (2005). Sample size of 12 per group rule of thumb for a pilot study. *Pharmaceutical Statistics, 4*(4), 287-291. doi:10.1002/pst.185

Kim H. Y. (2014). Statistical notes for clinical researchers: Nonparametric statistical methods: 1. Nonparametric methods for comparing two groups. *Restorative Dentistry & Endodontics, 39*(3), 235–239. doi:10.5395/rde.2014.39.3.235

Krajewski, J., & Flaherty, T. (2000). Attitudes of high school students toward individuals with mental retardation. *Mental Retardation, 38*(2), 154–162. https://doi.org/10.1352/0047-6765(2000)038<0154:AOHSST>2.0.CO;2

Krajewski, J., & Hyde, M. S. (2000) Comparison of teen attitudes toward individuals with mental retardation between 1987 and 1998: Has inclusion made a difference?. *Education and Training in Mental Retardation and Developmental Disabilities, 35*(3), 284–293. Retrieved from https://www.jstor.org/stable/23879650

Lee, J. X., Ong, S. I., Lee, V. Y., & Fairuz, N. A. R. (2017). Parenting stress among Malaysian parents of children with autism spectrum disorder (ASD). *Medicine and Health, 12*(1), 42-55. doi:10.17576/MH.2017.1201.06

Lee, O., & Shin, M. (2019). A national online survey of South Korean high school students' understanding of learning disabilities. *Learning Disability Quarterly, 42*(1), 46-59. doi:10.1177/0731948718790062

Lindsay, S., & Edwards, A. (2013). A systematic review of disability awareness interventions for children and youth. *Disability and Rehabilitation, 35*(8), 623-646. doi:10.3109/09638288.2012.702850

Lochner, O. K. (2019). *Exploring the impact of Autism awareness interventions for general education students: A meta-analysis*. (Doctoral dissertation). Retrieved from https://uknowledge.uky.edu/edp_etds/88/

Matheson, C., Olsen, R. J., & Weisner, T. (2007). A good friend is hard to find: Friendship among adolescents with disabilities. *American Journal on Mental Retardation, 112*(5), 319-329. doi:10.1352/0895-8017(2007)112[0319:agfiht]2.0.co;2

Mavropoulou, S., & Sideridis, G. D. (2014). Knowledge of Autism and attitudes of children towards their partially integrated peers with Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders, 44*, 1867-1885. doi:10.1007/s10803-014-2059-0

McDougall, J., DeWit, D. J., King, G., Miller, L. T., & Killip, S. (2004). High school-aged youths' attitudes toward their peers with disabilities: The role of school and student interpersonal Factors. *International Journal of Disability, Development and Education, 51*(3), 287-313. doi:10.1080/1034912042000259242

McManus, J. L., Feyes, K. J., & Saucier, D. A. (2010). Contact and knowledge as predictors of attitudes toward individuals with intellectual disabilities. *Journal of Social and Personal Relationships, 28*(5), 579–590. doi:10.1177/0265407510385494

Ministry of Education. (2004). *The development of education, national report of Malaysia*. Retrieved from https://www.yumpu.com/en/document/read/36199280/the-development-of-education-national-report-of-malaysia-

Ministry of Education. (2013). *Malaysia education blueprint 2013-2025 (Preschool to post-education).* Retrieved from https://www.ilo.org/dyn/youthpol/en/equest.fileutils.dochandle?p_uploaded_file_id=406

Mohamed, E., & Ahmed, N. (2017). Sampling methods in clinical research; an educational review. *Emergency, 5*(1), e52. doi:10.22037/emergency.v5i1.15215

Moore, K., & Bedford, J. (2017). *Childhood disability in Malaysia: A study of knowledge, attitudes and practices*. Retrieved from United Nations Children's Fund Website: http://www.unicef.org/malaysia/media/281/file

Nahm, F. S. (2016). Nonparametric statistical tests for the continuous data: The basic concept and the practical use. *Korean Journal of Anesthesiology, 69*(1), 8-14. doi:10.4097/kjae.2016.69.1.8

National Early Childhood Intervention Council. (2013). *Screening & diagnosing learning disabilities*. Retrieved from http://www.necicmalaysia.org/newsmaster.cfm?&menuid=6&action=view&retrieveid=15&fbclid=IwAR0T0LKhguVo5Npw5Na0Y2M-PeFhR_SGvlpzy7vMNzYuVqWV8Vzob5bldWs

Nikolaraizi, M., & de Rebekiel, N. (2002) A comparative study of children's attitudes towards deaf children, children in wheelchairs, and blind children in Greece and in the UK. *European Journal of Special Needs Education, 16*(2), 167–182. https://doi.org/10.1080/08856250110041090

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods, 16*(1), 1-13. https://doi.org/10.1177/1609406917733847

Packer, L. (2005). Tic-related school problems: Impact on functioning, accommodations, and interventions. *Behavior Modification, 29*(6), 876–899. https://doi.org/10.1177/0145445505279383

Persons with Disabilites Act, 2008. Retrieved from http://www.agc.gov.my/agcportal/uploads/files/Publications/LOM/EN/Act%20685.pdf

Peters, H. (2010). Mental health: Special needs and education. *ASEAN Journal of Psychiatry, 11*(1), 1-7. Retrieved from https://pdfs.semanticscholar.org/c4a4/9ad7163c5c091f2ec005c0a4c406ce5284d8.pdf

Prestia, K. (2003). Tourette's Syndrome: Characteristics and interventions. *Intervention in School and Clinic, 39*(2), 67–71. doi:10.1177/10534512030390020101

Pudaruth, S., Gunputh, R. P., & Singh, U. G. (2017). Forgotten, excluded or included? Students with disabilities: A case study at the University of Mauritius. *African Journal of Disability, 6*, 359. doi:10.4102/ajod.v6i0.359

Reina, R., Lopez, V., Jimenez, M., Garcia-Calvo, T., & Hutzler, Y. (2011). Effects of awareness interventions on children's attitudes toward peers with a visual impairment. *International Journal of Rehabilitation Research, 34*(3), 243-248. doi: 10.1097/MRR.0b013e3283487f49

Rillotta, F., & Nettelbeck, T. (2007). Effects of an awareness program on attitudes of students without an intellectual disability towards persons with an intellectual disability.

Journal of Intellectual & Developmental Disability 32(1), 19-27. doi:10.1080/13668250701194042

Ryan, K. M. (1981). Developmental differences in reactions to the physically disabled. *Human Development, 24*(1), 240-256. doi:10.1159/000272685

Schacter, D. L., Addis, D. R., & Buckner, R. L. (2008). Episodic simulation of future events: Concepts, data, and applications. *Annals of the New York Academy of Sciences, 1124*(1), 39-60. doi:10.1196/annals.1440.001

Scior, K., & Furnham, A. (2011). Development and validation of the Intellectual Disability Literacy Scale for assessment of knowledge, beliefs and attitudes to intellectual disability. *Research in Developmental Disabilities, 32*, 1530–1541. doi:10.1016/j.ridd.2011.01.044

Shaari, B. O. (2018). *Pelaksanaan zero reject policy bagi memberikan akses pendidikan kepada murid berkeperluan khas (mbk) mulai tahun 2019*. Putrajaya, Malaysia: Pejabat Timbalan Ketua Pengarah Pelajaran Malaysia.

Siah, P. C., Ong, C. S. B., Tan, S. M., Sim, C. P., & Thoo, R. Y. X. (2017). Factors affecting school choice: What do Malaysian Chinese parents want?. *Journal of School Choice, 12*(1), 34-51. doi:10.1080/15582159.2017.1408001

Silton, N. R., & Fogel, J. (2012). Enhancing positive behavioral intentions of typical children towards children with Autism. *Journal of Cognitive and Behavioral Psychotherapies, 12*(2), 139-158. Retrieved from https://www.researchgate.net/publication/241806036_Fostering_knowledge_positive_intentions_and_attitudes_of_typical_children_towards_children_with_autism

Siti, N. I. I., Ismarulyusda, I., Azriani, R., Nur, Z. M. S., Normah, C. D., Syarif, H. L., & Muhammad, F. M. I. (2017). Perceived stress and coping styles among Malay caregivers of children with learning disabilities in Kelantan. *Malaysian Journal of Medical Sciences, 24*(1), 81-93. https://doi.org/10.21315/mjms2017.24.1.9

Staub, D., Spaulding, M., Peck, C. A., Galluci, C., & Schwartz, I. S. (1996). Using nondisabled peers to support the inclusion of students with disabilities at the junior high school level. *Research and Practice for Persons with Severe Disabilities, 21*(4), 194-205. https://doi.org/10.1177/154079699602100408

Su, H., Cuskelly, M., Gilmore, L., & Sullivan, K. (2015). Examination of a scale assessing attitudes towards individuals with intellectual disability in China. *International Journal of Disability, Development and Education*, *62*(6), 660-675. doi:10.1080/1034912X.2015.1077938

Swaim, K. F., & Morgan, S. B. (2001). Children's attitudes and behavioral intentions toward a peer with Autistic behaviors: Does a brief educational intervention have an effect?. *Journal of Autism and Developmental Disorders, 31*(2), 195-205. doi:10.1023/A:1010703316365

The Government of Malaysia's Official Portal (n.d.). *Obtaining general information on special education primary schools*. Retrieved from https://www.malaysia.gov.my/portal/content/29488?s=lifeevent

Ting, T. X. N., Lee, L. W., Low, H. M., Chia, N. K. H., & Chua, A. C. K. (2014). Prevalence, diagnosis, treatment and research on Autism Spectrum Disorders (ASD) in Singapore and Malaysia. *International Journal of Special Education, 29*(3), 82-92. Retrieved from

https://www.researchgate.net/publication/286065209_Prevalence_diagnosis_treatment_and_research_on_autism_spectrum_disorders_ASD_in_Singapore_and_Malaysia

Tipton, L. A., Christensen, L., & Blacher, J. (2013). Friendship quality in adolescents with and without an intellectual disability. *Journal of Applied Research in Intellectual Disabilities, 26*(6), 522-532. doi:10.111/jar.12051

Torgerson, D. J., & Torgerson, C. J. (2008). *Designing randomised trials in health, education, and the social sciences* [Google Books]. doi:10.1057/9780230583993

Townsend, M. A. R., Wilton, K. M., & Vakilirad, T. (1993). Children's attitudes toward peers with intellectual disability. *Journal of Intellectual Disability Research, 37*(4), 405-411. https://doi.org/10.1111/j.1365-2788.1993.tb00883.x

United Nations Children's Fund. (2017). *Inclusive education: Understanding article 24 of the convention on the rights of person with disabilities*. Retrieved from http://www.unicef.org/eca/sites/unicef.org.eca/files/IE_summary_accessible_220917_0.pdf

United Nations Educational, Scientific and Cultural Organization. (2007). *Education for all by 2015 will we make it?*. Retrieved from www.unesco.org/education/gmr2008/press/Full-report.pdf

United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. Retrieved from https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf

Weare, K., & Markham, W. (2005). What do we know about promoting mental health through schools?. *Promotion & Education, 12*(3-4), 118-122. https://doi.org/10.1177/10253823050120030104

Webb, T. L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin, 132*(2), 249-268. doi:10.1037/0033-2909.132.2.249

Wells, J., Barlow, J., & Stewart-Brown, S. (2003). A systematic review of universal approaches to mental health promotion in schools. *Health Education, 103*(4), 197-220. doi:10.1108/09654280310485546

Wieczorek, M., Sadziak, A., & Matczak, D. (2019). Attitudes towards persons with intellectual disabilities in adolescents. *Journal of Education, Health and Sport*, *9*(1), 106-123. doi:10.5281/zenodo.2532864

Wilson, M. C., & Scior, K. (2015). Implicit attitudes towards people with intellectual disabilities: Their relationship with explicit attitudes, social distance, emotions and contact. *PloS One, 10*(9), e0137902. doi:10.1371/journal.pone.0137902

Woolson, R. F. (2008). Wilcoxon Signed-Rank Test. *Wiley Encyclopedia Clinical Trials*, *1*, 1-3. doi:10.1002/9780471462422.eoct979

World Bank Group. (2019). *Disability inclusion*. Retrieved from https://www.worldbank.org/en/topic/disability#1

World Health Organization. (2011). *World report on disability*. Retrieved from https://www.who.int/disabilities/world_report/2011/report.pdf

World Health Organization. (2018). *Disability and health*. Retrieved from https://www.who.int/news-room/fact-sheets/detail/disability-and-health

Zalizan, M. J., & Manisah, M. A. (2014). Inclusive education in Malaysia: Policy and practice. *International Journal of Exclusive Education, 18*(10), 991-1003. doi:10.1080/13603116.2012.693398

Zuki, N. H. M., & Rahman, N. S. N. A. (2016). Challenges Malaysian teachers face in the inclusion of autistic students in the normal classroom. *Journal of Education and Social Sciences, 4*, 33-41. Retrieved from https://www.jesoc.com/wp-content/uploads/2016/08/Edu-30.pdf

Appendix A1

Wholly owned by UTAR Education Foundation
(Co. No. 578227-M)
DU012(A)

金宝拉曼大学

调查研究：家长/监护人同意书

亲爱的家长或监护人：

您的孩子受邀参与一项调查研究。我们正在进行一项能帮助青少年提高对于大脑多样性者的一些知识，态度，和行为意图的研究活动。本研究活动由拉曼大学生举行。

我们邀请您的孩子做什么？

- 研究将仅在研究期间进行。无需在家为研究做任何事。
- 您的孩子将需在研究前后回答一份研究调查问卷。问题是有关于他们对于大脑多样性者的知识，态度，和行为意图。 回答这些问题将需要大约 15 分钟。
- 您的孩子需要出席一项 4 小时的培训活动。此活动将被分为两天进行，一天为两小时。

参与本研究的益处和风险。本研究将让您的孩子学到更多有关大脑多样性者，这也许也会让您孩子的态度和行为意图从消极变为积极。本研究对您或您孩子没有可预见的风险或不适。

隐私和保密。所有在本研究得到的资料包括照片和影片都会保密，这些资料只会用在这项研究中。换言之，我们不会把资料给第三者。若这项研究结果将要对外发布，资料将以群体的方式呈现而非个人的方式。这是未来确保参与者的个人资料不被泄露出去。

对本研究的参与属自愿。无论您是否选择让您的孩子参与研究，均不会对您或您的孩子构成问题。如果您不希望您的孩子参与，对于本研究而言没有任何问题。如果您同意您的孩子可以参与研究，我们也会询问您的孩子他/她是否将参与研究。您的孩子可以随时退出研究，而不会产生任何问题。

如果您对有关于研究有任何疑问，可以联络以下研究人员，Pheh Kai Shuen (phehks@utar.edu.my)或 Wong Xio Zen (xiozen1026@1utar.my)。

如果您同意，请勾选以下方框：

□ 是的，我同意让我的孩子参与本研究。

孩子姓名: _____

家长/监护人姓名: _____

家长/监护人签名: _____

日期: _____

Appendix A2

Wholly owned by UTAR Education Foundation
(Co. No. 578227-M)
DU012(A)

金宝拉曼大学

调查研究：参与者同意书

亲爱的参与者:

你受邀参与一项调查研究。我们正在进行一项能帮助青少年提高对于大脑多样性者的一些知识，态度，和行为意图的研究活动。本研究活动由拉曼大学生举行。

我们邀请你做什么?

- 研究将仅在研究期间进行。无需在家为研究做任何事。
- 你将需在研究前后回答一份研究调查问卷。问题是有关于他们对于大脑多样性者的知识，态度，和行为意图。 回答这些问题将需要大约 15 分钟。
- 你需要出席一项 4 小时的培训活动。此活动将被分为两天进行，一天为两小时。

参与本研究的益处和风险。本研究将让你学到更多有关大脑多样性者，这也许也会让你的态度和行为意图从消极变为积极。本研究对你没有可预见的风险或不适。

隐私和保密。所有在本研究得到的资料包括照片和影片都会保密，这些资料只会用在这项研究中。换言之，我们不会把资料给第三者。若这项研究结果将要对外发布，资料将以群体的方式呈现而非个人的方式。这是未来确保你的个人资料不被泄露出去。

对本研究的参与属自愿。无论你是否选择参与研究，均不会对你构成问题。如果你参与，对于本研究而言没有任何问题。你可以随时退出研究，而不会产生任何问题。

如果你对有关于研究有任何疑问，可以联络以下研究人员，Pheh Kai Shuen (phehks@utar.edu.my)或 Wong Xio Zen (xiozen1026@1utar.my)。

你可以根据自己的意愿决定是否要参与这项研究。如果你同意，请勾选以下方框：

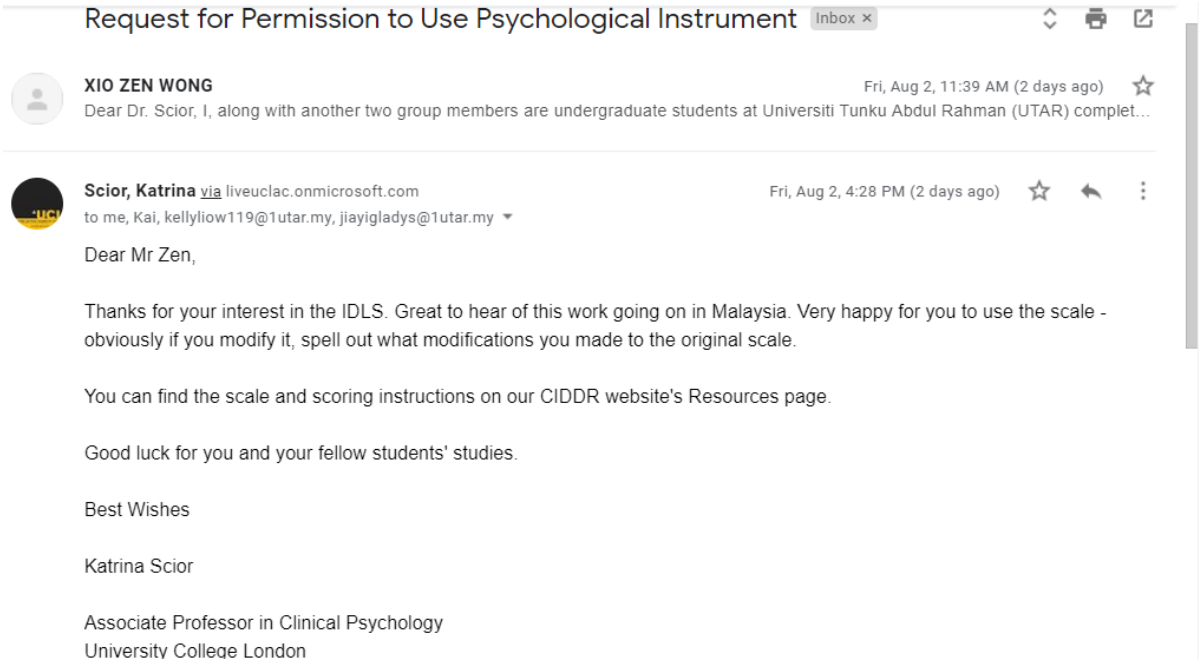
□ 是的，我同意参与本研究。

姓名: _____

签名: _____

日期: _____

Appendix B1



Request for Permission to Use Psychological Instrument Inbox ×

XIO ZEN WONG Fri, Aug 2, 11:39 AM (2 days ago)

Dear Dr. Scior, I, along with another two group members are undergraduate students at Universiti Tunku Abdul Rahman (UTAR) complet...

Scior, Katrina via liveuclac.onmicrosoft.com Fri, Aug 2, 4:28 PM (2 days ago)

to me, Kai, kellyliow119@1utar.my, jiayigladys@1utar.my

Dear Mr Zen,

Thanks for your interest in the IDLS. Great to hear of this work going on in Malaysia. Very happy for you to use the scale - obviously if you modify it, spell out what modifications you made to the original scale.

You can find the scale and scoring instructions on our CIDDR website's Resources page.

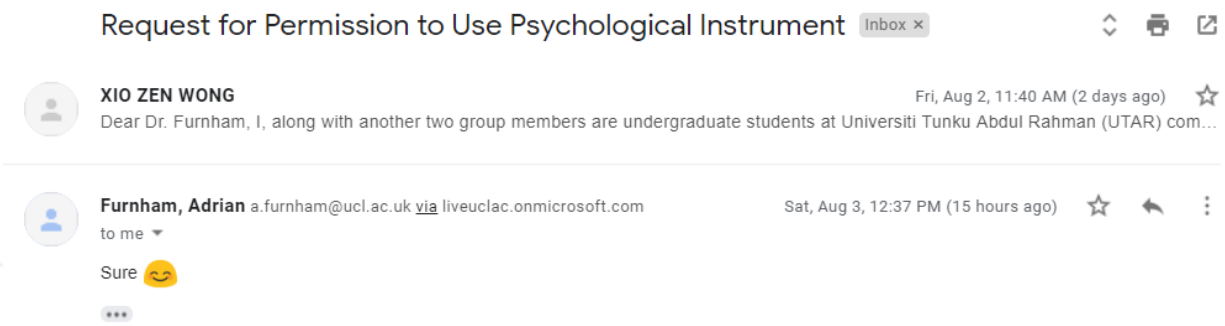
Good luck for you and your fellow students' studies.

Best Wishes

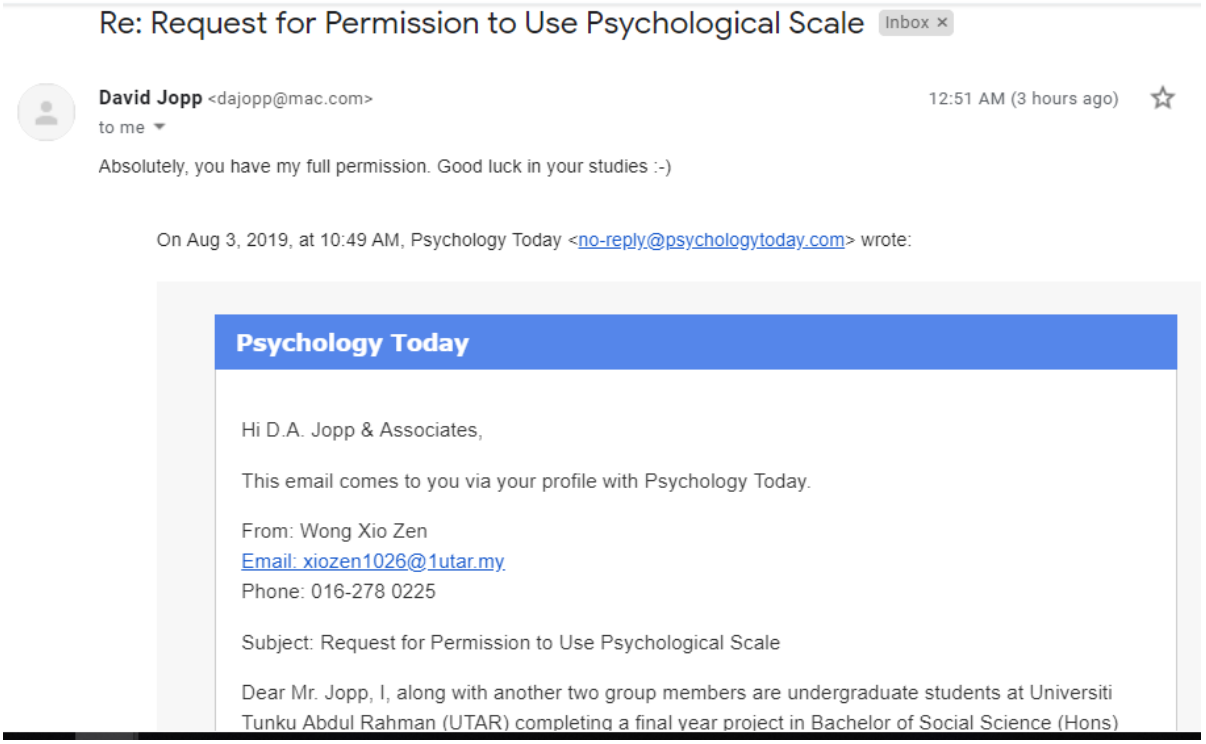
Katrina Scior

Associate Professor in Clinical Psychology
University College London

Appendix B2


Request for Permission to Use Psychological Instrument
Inbox ×
XIO ZEN WONG
Fri, Aug 2, 11:40 AM (2 days ago)
Dear Dr. Furnham, I, along with another two group members are undergraduate students at Universiti Tunku Abdul Rahman (UTAR) com...
Furnham, Adrian a.furnham@ucl.ac.uk via liveuclac.onmicrosoft.com
Sat, Aug 3, 12:37 PM (15 hours ago)
to me
Sure

Appendix B3



Re: Request for Permission to Use Psychological Scale Inbox ×

David Jopp <dajopp@mac.com> 12:51 AM (3 hours ago)
to me

Absolutely, you have my full permission. Good luck in your studies :-)

On Aug 3, 2019, at 10:49 AM, Psychology Today <no-reply@psychologytoday.com> wrote:

Psychology Today

Hi D.A. Jopp & Associates,

This email comes to you via your profile with Psychology Today.

From: Wong Xio Zen
Email: xiozen1026@1utar.my
Phone: 016-278 0225

Subject: Request for Permission to Use Psychological Scale

Dear Mr. Jopp, I, along with another two group members are undergraduate students at Universiti Tunku Abdul Rahman (UTAR) completing a final year project in Bachelor of Social Science (Hons)

Appendix C1

A. Knowledge of Autism Questionnaire (KOA)

What is Autism?

We would like to know what you know about autism. Please answer the following questions using true or false. If you believe the statement is true, please circle T. If you believe the statement is false, please circle F. Even if you are not sure of the answer, please answer all the questions as best as you can.

		T	F
1.	If someone has autism, it only lasts for about a week.		
2.	Students with autism often have a difficult time looking at other people.		
3.	Autism does not affect a person's brain.		
4.	Students with autism cannot do normal activities that other people can do, even with help from another person.		
5.	Students with autism sometimes repeat what is said to them.		
6.	Students with autism sometimes rock back and forth and wave their hands around.		
7.	Some students with autism might have trouble talking or expressing themselves.		
8.	Students with autism do not have difficulty changing activities and can easily move from one activity to another.		
9	Sometimes students with autism need extra help to learn how to read and write		
10.	You can catch autism by spending time with someone who has it, like you can catch a cold.		

Appendix C2

B. Community Living Attitudes Scale-Intellectual Disability (CLAS-ID)

What is a Learning Disability?

A '**learning disability**' is an umbrella term for a condition in which someone has an impairment in their ability to think (intellectual functioning) and to cope on their own on a day-to-day basis (social functioning) and which has been identified as having an onset before adulthood (18 years old). Learning disability is referred to in certain countries as an intellectual disability. In the past the terms **'mental handicap'** and **'mental retardation'** have also been used to denote this condition. Some specific syndromes and conditions such as Down's syndrome, Fragile X and Autism **may** in some cases be associated with having a learning disability.

Learning disabilities are different from specific learning difficulties such as Dyslexia, which are not the focus of this study.

Please indicate the extent to which you agree with the following statements according to this scale:

1 = Disagree strongly
2 = Disagree moderately
3 = Disagree somewhat
4 = Agree somewhat
5 = Agree moderately
6 = Agree strongly

		1	2	3	4	5	6
1.	People with learning disabilities should not be allowed to marry and have children.						
2.	A person would be foolish to marry a person with learning disabilities.						
3.	People with learning disabilities can plan meetings and conferences without assistance from others.						
4.	People with learning disabilities can be trusted to handle money responsibly.						
5.	The opinions of a person with learning disabilities should carry more weight than those of family members and professionals in decisions affecting that person.						
6.	Sheltered workshops for people with learning disabilities are essential.						
7.	Increased spending on programs for people with						

	learning disabilities is a waste of money.						
8.	Homes and services for people with learning disabilities downgrade the neighbourhoods they are in.						
9.	People who have learning disabilities are a burden on society.						
10.	Homes and services for people with learning disabilities should be kept out of residential neighbourhoods.						
11.	People with learning disabilities need someone to plan their activities for them.						
12.	People with learning disabilities do not need to make choices about the things they will do each day.						
13.	People with learning disabilities can be productive members of society.						
14.	People with learning disabilities have goals for their lives like other people.						
15.	People with learning disabilities can have close personal relationships just like everyone else.						
16.	People with learning disabilities should live in sheltered facilities because of the dangers of life in the community.						
17.	People with learning disabilities usually should be in group homes or other facilities where they can have the help and support of staff.						

Appendix C3

C. Intellectual Disability Literacy Scale (IDLS)

4. Please indicate your agreement with the following statements, using the same scale:

1.	I would be happy to move next door to someone like James							
2.	I would be happy to spend an evening socialising with someone like him							
3.	I would be happy to make friends with someone like him							
4.	I would be happy for someone like James to marry into my family							

Appendix C4

A. Mandarin Version of Knowledge of Autism (KOA) Questionnaire

姓名: 年龄: 性别:

什么是自闭症?

我们想知道你对自闭症的了解。请针对以下的陈述选择是或否。如果你觉得该陈述是对的，请选择'是'。如果你觉得该陈述是错的，请选择'否'。若你不清楚答案，也请尽你所能去回答所有的答案。

		是	否
1.	自闭症只会维持一个星期。		
2.	自闭症的学生很难直视他人。		
3.	自闭症不会影响一个人的头脑。		
4.	即使有他人的帮助，自闭症学生也无法像一般人那样进行日常活动。		
5.	有时候自闭症学生会重复别人所说的话。		
6.	有时候自闭症学生会来回摇晃和把手在空气中挥舞。		
7.	一些患有自闭症的学生可能在谈话或表达自己时会遇到困难。		
8.	患有自闭症的学生在切换活动方面没有困难，且可以轻松地从一项活动转移到另一项活动。		
9	有时候自闭症学生需要额外的帮助来学习如何阅读和书写。		
10.	如果你花时间跟自闭症的学生在一起，你也会患上自闭症，就好像感冒一样。		

Appendix C5

B. Modified and Mandarin Version of Community Living Attitudes Scale-Intellectual Disability (CLAS-ID)

什么是大脑多样性？

“大脑多样性“是指人的大脑发展是非常多样化的，而且每个人都会不一样，在不同方面（如人际关系, 语文能力，数学能力，艺术感，情绪管理等等） 会有个别的长处及短处。在医学上，一些大脑多样性者会被诊断成自闭症，学习障碍，社交沟通障碍等等。

请根据以下的陈述选择最适合的答案。选项有:

1 = 非常不同意　　4 = 稍微同意
2 =相当不同意　　5 = 相当的同意
3 = 稍微不同意　　6 = 非常同意

		1	2	3	4	5	6
1.	大脑多样性者不应该被允许结婚生子。						
2.	如果一个人和大脑多样性者结婚将会是愚蠢的。						
3.	大脑多样性者可以在没有人的帮助下独立完成策划会议。						
4.	大脑多样性者可以负责任和被信任地管理金钱。						
5.	在做出会影响大脑多样性者的决策时，他们（大脑多样性者）的意见比专业人士及家人更为重要。						
6.	提供一个安全的工作环境给大脑多样性者是重要的。						
7.	增加大脑多样者的项目开支是浪费金钱的行为。						
8.	为大脑多样性者提供的住所或护理中心将会使该社区被看不起。						
9.	大脑多样性者是社会的负担。						
10.	为大脑多样性者提供的住所或护理中心应该放置在住宅区以外的地方。						
11.	大脑多样性者的日常生活需要别人帮助规划。						
12.	大脑多样性者不需要对他们的日常生活做						

	出决定。						
13.	大脑多样性者可以为社会带来贡献。						
14.	大脑多样性者和所有人一样也有人生目标。						
15.	大脑多样性者也可以和所有人一样拥有要好的人际关系。						
16.	大脑多样性者应该住在受保护的设施里，因为社区可能会对他们造成生命威胁。						
17.	大脑多样性者应该居住在残障人士之家或其他可以获得看护员支持与帮助的设备。						

Appendix C6

C. Modified and Mandarin Version of Intellectual Disability Literacy Scale (IDLS)

请根据以下的陈述选择最适合的答案。选项有:

1 = 非常不同意
2 = 相当的不同意
3 = 稍微不同意
4 = 不确定
5 =稍微同意
6 = 相当的同意
7 = 非常同意

		1	2	3	4	5	6	7
1.	我愿意的搬到大脑多样性者的隔壁居住。							
2.	我愿意花一个傍晚与大脑多样性者互动。							
3.	我很乐意的跟大脑多样性者做朋友。							
4.	如果大脑多样性者和我的家人结婚，我会感到高兴。							

Appendix D1

Activity 1: Perspective-taking Activity

The main learning objective of this activity was to convey each person has different perspectives in seeing things due to the different formation brain structures in each individual. Other than that, the second learning objective was to convey there is no right or wrong in these differences. The activity was conducted by first separating the participants into seven groups with five to six participants in a group. Next, each group was given six pictures to discuss what they have seen in those pictures. Then, they were asked to list down what they have seen by writing it down in the paper, since there could be different images seen by the participants. The pictures given to the participants would create the effect of an optical illusion. For example, a picture which contains a frog and a horse, a picture of a young lady and an old lady, a picture of a human face and a vase, a picture of a duck and a lady. The activity took around 20 minutes to allow the participants to discuss in their groups. After that, five minutes were allocated for the facilitator to debrief the activity.

Activity 2: Sensory Overload Obstacle Activity

The learning objective of this activity was to allow the participants to experience how sensory overload feels like for neurodiverse people. Participants were required to sit in their groups with their faces facing the front of the classroom. After that, the facilitators distributed a question paper which consisted of a few math questions to each participant. The purpose of using math questions was to enable participants to fully concentrate in solving the math questions. In addition, they were required to answer the math questions individually without any discussion with their peers. After two minutes, a video was played while the participants were concentrating answering the math questions. Although the video was playing, it was not shown to the participants. Thus, participants were only able to listen to the sound of the video.

Several minutes later, participants were told to stop doing the math questions, and they were asked to share their feelings of being irritated with the surrounding noises while trying to focus on doing something. After that, participants were shown the video, which portrayed a child with autism who was currently experiencing sensory overload. Instead of just showing the video to the participants to increase their understanding, participants were given the opportunity to experience being annoyed with a series of unwanted noises. Thus, it was hoped that this activity would have a greater impact on the participants in terms of increasing their understanding of how neurodiverse people feel like at times of being sensory overloaded. The activity took approximately 15 minutes to conduct including a debrief session.

Activity 3: Multiple Intelligence Model Activity

The learning objective of this activity was to convey each person has their strengths and weaknesses, and these differences should be acknowledged. In this activity, participants were required to complete a 40-item multiple intelligence test. There were eight sections which were needed to be done by the participants, and they were also required to compute the total score for each section to determine which intelligences were strongest for them. The activity was continued on with the debrief session by explaining to the participants regarding each section of the multiple intelligence model. The purpose of this was to allow them to know about their personal strengths and weaknesses. In addition to that, several well-known individuals who are neurodiverse were also introduced to the participants. The purpose of this was to allow them to know that despite the fact that they are neurodiverse or they have their weaknesses, it did not hinder them from contributing to the society or becoming successful, which implied that they have their strengths as well. This activity took around 30 minutes to complete including the debrief session.

Activity 4: Anti-Bullying Activity

The learning objective of this activity was to enhance participants' empathy by giving them the opportunity to experience what helplessness, being bullied, and loneliness feels like. First, all participants were required to form a circle by linking their arms together, and only one participant was required to volunteer himself or herself to stand in the middle of the circle. The rule of the activity was the person in the middle of the circle has to find a way to escape out of the circle, while the rest of the participants have to prevent the person in the middle of the circle to escape. The person in the middle of the circle was given only two minutes to try to escape out of the circle. If the person failed to escape within two minutes, another person has to volunteer to be in the middle of the circle together with the first volunteer. After that, they were allowed to discuss their strategy to escape the circle together. Once again after two minutes, the first volunteer may join the rest of the participants. This was to ensure that the person in the middle of the circle has the experience of being alone and helpless while trying to escape, being accompanied by another person while trying to escape, and being one of the people to prevent the person in the middle of the circle to escape. The activity took around 20 minutes to be done including a debrief session.

Activity 5: Obstacle Overcoming Activity

The learning objective of this activity was to promote tolerance, helping behavior and empathy among students. This activity is also known as a disabled-stimulation activity in which participants' hand or leg movements was limited and tied by using raffia strings. Besides that, some of the participants were blind-folded as well. This was a group activity. For this activity, post-it notes which contained information about the symptoms of autism, ADHD, SLD, and tic's disorder were pasted on the wall of the classroom. Participants' were also given four envelopes for each group. The name of a particular disorder was written on

each envelope, and each envelope represented a particular disorder. Hence, participants' responsibility was to collect the post-it notes, categorize them accordingly to the disorders, and put them into the envelope. Twenty-five minutes were allocated for the participants during this whole process. The interesting part of this activity was that in each group, some of the participants' hands were tied together whereas some of the participants' legs were tied together. There were also participants whose hands and legs were both tied together, and some were blind-folded. The reason for this was to encourage the participants to work as a team in their own group to help each other in the process of collecting the post-it notes, since it would be difficult or inconvenient for some of them to collect it. For example, participants with both of their hands and legs may give instructions or directions to those who were blind-folded to collect the post-it notes while those who were blind-folded may take the role to collect the post-it notes. The debrief session included a 20-minute explanation of each disorder. Thus, this activity took approximately 45 minutes to be done.

Activity 6: Video-viewing Session

The learning objective of this session was to provide information regarding the symptoms of ADHD and the ways to assist people with ADHD. Participants were required to sit accordingly in their groups. Then, a short video clip about ADHD was shown to the participants. After that, each group was given three minutes to discuss about the ways which could be suggested to assist people with ADHD in their daily lives. Each group was given a chance to share their suggestions to the rest of the participants. After the sharing session ended, the facilitators then explained about the appropriate ways to assist people with ADHD during the debrief session. This activity took around ten minutes to be completed including the debrief session.

Activity 7: 3R (Regulate, Relate, Reason)

The learning objective of this activity teach the participants regarding the appropriate ways of helping neurodiverse people. This activity was conducted in the form or a role-play. The facilitators first acted out a scene to the participants by portraying a meltdown situation of an individual with autism. Based on this scene, participants were given five minutes to discuss among their groups on the appropriate ways to help the individual with autism during a meltdown. After that, they were required to perform a role-play in front of the classroom on how they would help the individual with autism if they encountered such a situation. Each group was asked to prepare at least one way to deal with the situation. After all groups have demonstrated the role-play, the facilitators then provided information about the appropriate steps to deal with a meltdown situation, which was the 3R (Regulate, Relate, Reason) steps in a detailed manner with some simple demonstrations to enhance participants' understanding. This activity took approximately 45 minutes to complete including a debrief session.

Reflection Session

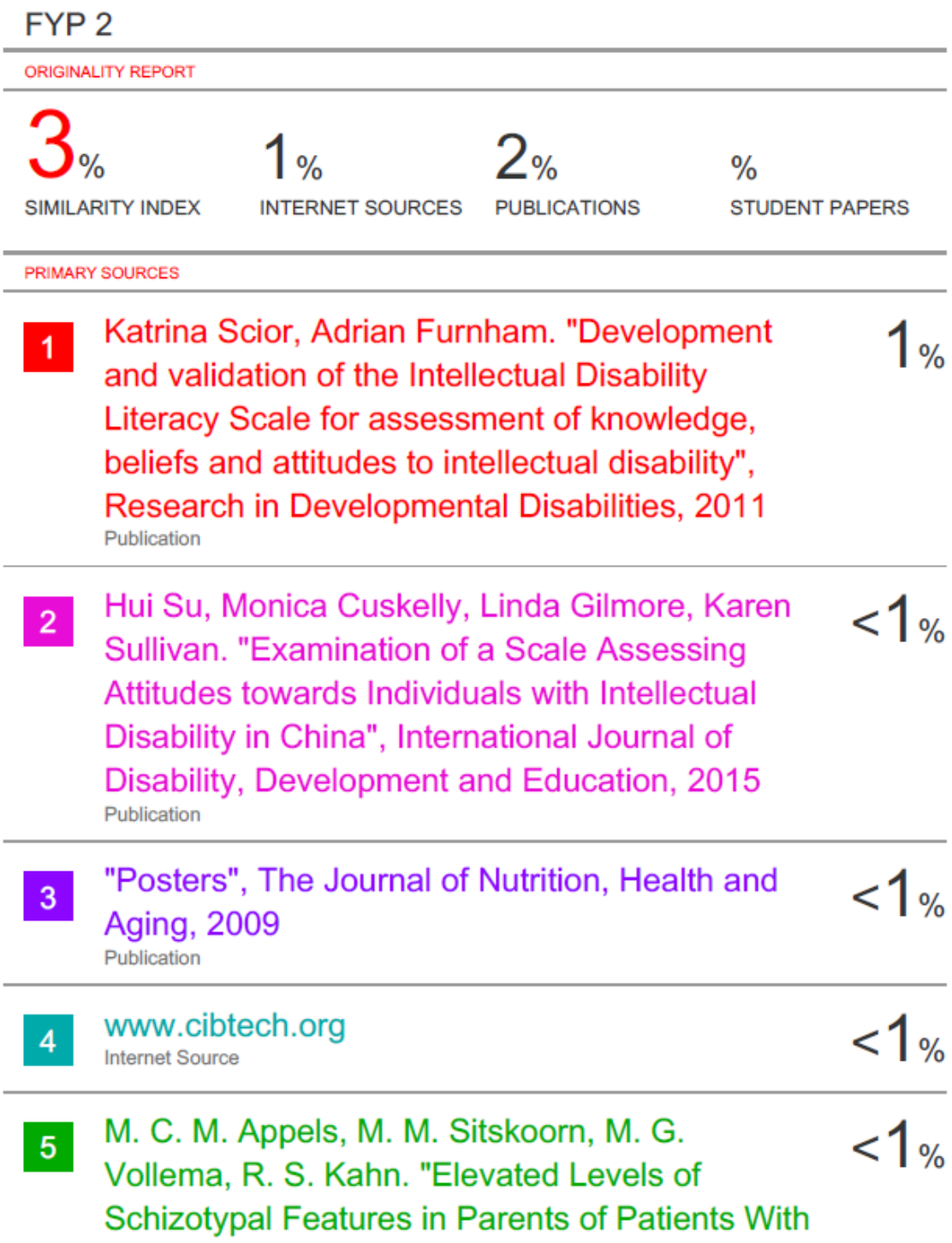
This session was conducted to give participants an opportunity to share their learning experiences and thoughts throughout the two-day neurodiversity literacy program. This session was conducted to refresh participants' memory of what they have learned from the program. Participants were required to sit in a big circle, and were encouraged to voluntarily share their thoughts, experiences, and feelings about the neurodiversity literacy program. After that, the facilitators briefly summarized the two-day program by highlighting some of the important information to the participants. Only a short ten minutes were allocated for this session.

Appendix D2


克服障碍


兒童青少年注意力不足過動症之診斷以及治療
宜與專業兒童青少年精神科醫師討論。

Appendix E1



FYP 2

ORIGINALITY REPORT

3%	1%	2%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Katrina Scior, Adrian Furnham. "Development and validation of the Intellectual Disability Literacy Scale for assessment of knowledge, beliefs and attitudes to intellectual disability", Research in Developmental Disabilities, 2011 Publication	1%
2	Hui Su, Monica Cuskelly, Linda Gilmore, Karen Sullivan. "Examination of a Scale Assessing Attitudes towards Individuals with Intellectual Disability in China", International Journal of Disability, Development and Education, 2015 Publication	<1%
3	"Posters", The Journal of Nutrition, Health and Aging, 2009 Publication	<1%
4	www.cibtech.org Internet Source	<1%
5	M. C. M. Appels, M. M. Sitskoorn, M. G. Vollema, R. S. Kahn. "Elevated Levels of Schizotypal Features in Parents of Patients With	<1%

	a Family History of Schizophrenia Spectrum Disorders", Schizophrenia Bulletin, 2004 Publication	
6	Sebastian Dünnebeil, Ali Sunyaev, Ivo Blohm, Jan Marco Leimeister, Helmut Krcmar. "Determinants of physicians' technology acceptance for e-health in ambulatory care", International Journal of Medical Informatics, 2012 Publication	<1%
7	Jessica S. James. "Beliefs about intellectual disability among employees at a state facility and undergraduate students: An exploratory analysis", Journal of Applied Research in Intellectual Disabilities, 2018 Publication	<1%
8	journals.sagepub.com Internet Source	<1%
9	Thomas L. Webb, Paschal Sheeran. "Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence.", Psychological Bulletin, 2006 Publication	<1%
10	medicaljournals.se Internet Source	<1%
	M. N. Vidanapathirana, S. Varothayan, D. C.	


11
Vilochani, C. Wangmo, H. Jayakody. "Knowledge and attitudes on gender equality and their correlates among the second year students of University of Colombo", Ceylon Journal of Medical Science, 2017
Publication
<1%
12
eprints.whiterose.ac.uk
Internet Source
<1%
13
Scior, K.. "Development and validation of the Intellectual Disability Literacy Scale for assessment of knowledge, beliefs and attitudes to intellectual disability", Research in Developmental Disabilities, 201109/10
Publication
<1%
Exclude quotes On
Exclude bibliography On
Exclude matches < 10 words