

A Project entitled

An exploration on Hong Kong pre-service teachers' knowledge, attitude and training towards students with dyslexia

Submitted by

CHUNG, King Chi

submitted to The Education University of Hong Kong

for the degree of *Bachelor of Education (Honours) in English Language – Secondary*

in *April 2019*

Declaration

I, *CHUNG, King Chi*, declare that this research report represents my own work under the supervision of *Lecturer Dr. LAU, Ngai-sze Elsa*, and that it has not been submitted previously for examination to any tertiary institution.

Signed Ben

CHUNG, King Chi

14 April, 2019

Table of Contents

Abstract	5
1. Introduction	5
1.1 <i>Prevalence rate of dyslexia in the world</i>	6
1.2 <i>Definition of dyslexia and identification in Hong Kong schools.....</i>	7
1.3 <i>The reasons for investigating pre-service teachers' knowledge, attitude and training towards students with dyslexia</i>	8
2. Literature Review	9
2.1 <i>Pre-service teachers' knowledge towards students with dyslexia</i>	9
2.2 <i>Pre-service teachers' attitude and training towards students with dyslexia.....</i>	11
3. Research Questions and Hypotheses.....	12
4. Methodology	13
4.1 <i>Participants</i>	13
4.2 <i>Instruments</i>	15
4.2.1 <i>Questionnaire</i>	15
4.2.2 <i>Interview</i>	17
5. Results and Discussions.....	18
5.1 <i>Pre-service teachers' knowledge towards students with dyslexia.....</i>	18
5.1.1 <i>Differences in the mean score between male and female pre-service teachers</i>	20
5.1.2 <i>Discussions on the misconceptions of pre-service teachers.....</i>	20
5.1.3 <i>Discussions on the accurate descriptions (knowledge) of pre-service teachers</i>	24
5.2 <i>Pre-service teachers' attitude towards students with dyslexia.....</i>	27
5.2.1 <i>Differences in the mean score between male and female pre-service teachers</i>	28
5.2.2 <i>Discussions on pre-service teachers' views on every aspect</i>	30
5.3 <i>The relationship between pre-service teachers' knowledge and attitude towards students' with dyslexia.....</i>	37
5.4 <i>Pre-service teachers' training towards students with dyslexia</i>	39
5.4.1 <i>Training received at EdUHK.....</i>	40
5.4.2 <i>The teaching practicum</i>	42
5.4.3 <i>Suggestions</i>	44
6. Limitations	46
7. Ethical concerns	46
8. Conclusion	47
9. References.....	49
Appendix 1: A sample questionnaire	55
Appendix 2: Interview questions.....	59
Appendix 3: Responses of the questionnaire.....	61

An exploration on Hong Kong pre-service teachers' knowledge, attitude and training towards students with dyslexia

Abstract

The purpose of the research study was to investigate Hong Kong pre-service teachers' knowledge, attitude and training towards students with dyslexia, to examine the relationship between the three items and to make recommendations to improve the current practices. A questionnaire concerning pre-service teachers' knowledge and attitude was adapted from Elias (2014) and Gwernan-Jones & Burden (2010), and an interview concerning pre-service teachers' training was designed. 92 English pre-service teachers from the Education University of Hong Kong were administered the questionnaire and 6 English pre-service teachers among the 92 were chosen for the interview. Results indicated that participants were able to demonstrate some accurate knowledge about dyslexia but showed more misunderstandings about dyslexia, and they were overall positive towards five key aspects of dyslexia suggested by Gwernan-Jones & Burden (2010). Results also showed that participants did not receive enough training and opportunities to acquire and apply certain skills and teaching strategies in real-life settings. Limitations and ethical concerns of the study are covered. Implications concerning teacher training programs in Hong Kong as well as future research directions are also discussed.

1. Introduction

Integration of students with special educational needs (SEN) into regular classroom settings has been implemented for two to three decades in the western countries. Hong Kong, as one of the Asian districts, decided to embrace the Salamanca Statement legislated in 1994 which aims at urging governments to endorse integration in the schooling system (Wong-Ratcliff & Ho, 2011).

In 1996, the Legislative Council enacted the Disability Discrimination Ordinance which eliminates and prevents discrimination against people with disabilities and ensures that there are equal opportunities for the disabled in education (Education Bureau, 2014; Wong-Ratcliff & Ho, 2011). In 2001, 'Code of Practice on Education' was issued by The Equal Opportunities Commission according to the Disability Discrimination Ordinance which educates the public about the responsibilities of different stakeholders involving in the education field, including schools, teachers and parents, and provides pragmatic advice on complying with the legal requirements (EDB, 2014). With a great number of policies implemented, the Education Bureau has promoted the idea to integrate the Whole School Approach into Integrated Education since 2008, and this implies that more and more SEN students would have an access to the mainstream curriculum and gain important life-learning experiences like typical developing students, and educators, especially teachers, have to learn different intervention strategies to cater for students with different specific educational needs (Wong-Ratcliff & Ho, 2011).

1.1 Prevalence rate of dyslexia in the world

According to the Education Bureau (2010), there are eight special educational needs in Hong Kong, including Intellectual Disability, Autism Spectrum Disorder, Physical Disability and Visual Impairment. One of the SENs, Specific Learning Difficulties (SpLD), found to occupy approximately 10% of school-aged children being affected to various degrees, with 3 to 5% estimated to be severely affected reported by the National Institute for Child Health and Development of the United States (Lam, 2004; Lyon, 1995). Similarly, in Hong Kong, a research conducted by Hong Kong Specific Learning Difficulties Research Team revealed that 10% of Chinese speakers in Hong Kong being diagnosed with dyslexia, with 1.3% considered to be in the severe group (Chan, Ho, Tsang, Lee & Chung, 2007). To be more related to children, the Department of Health (2017) in Hong Kong has released a report on

dyslexia and showed that the prevalence rate of dyslexia among children was to be from about 10% to 13%, with 10% believed to be severe. With the advancement in diagnosis tools, it is predicted that more and more hidden cases in schools will be discovered and more support will be needed for their specific learning needs (Chan et al., 2007). Therefore, it can be seen that dyslexia is not a minor issue across the globe and it is worth investigating how Hong Kong teachers can develop inclusive practices to help dyslexic students in schools.

1.2 Definition of dyslexia and identification in Hong Kong schools

SpLD, also known as Dyslexia, is a learning disability which is neurological in origin (The International Dyslexia Association, 2014). Dyslexic students are found to have problems in recognizing words accurately and pronouncing words fluently, spelling words and decoding (EDB, 2010; IDA, 2014; Lyon, Shaywitz & Shaywitz, 2003). Besides, it is difficult for them to reverse letters and comprehend reading materials which could possibly hinder the acquisition of vocabulary and content knowledge from different subjects (EDB, 2010; IDA, 2014; Lyon et al., 2003). Since most students with dyslexia are identified in early primary levels, teachers play an important role in early identification. According to the Education Bureau (2014, 2015a), teachers have to observe and complete the Observation Checklist for Teachers (OCT) for Primary 1 students being suspected to be diagnosed with learning difficulties; then, teachers would administer the norm-referenced Hong Kong Specific Learning Difficulties Behaviour Checklist to identify students with dyslexia in a more effective and efficient way. Therefore, as explained above, it is shown that the relationship between students with dyslexia and teachers is close and worth discussing.

1.3 The reasons for investigating pre-service teachers' knowledge, attitude and training towards students with dyslexia

Having mentioned the important role of teachers in early identification of students with dyslexia, it has been said that teachers' knowledge, attitude and training can have long-lasting consequences on students with disabilities, especially dyslexia (Good & Brophy, 1997). If teachers do not have sufficient knowledge about dyslexic students and thus hold a negative attitudes towards them, there could be a risk that dyslexic students may suffer from depression and anti-social behaviour (Macdonald, 2009). Some research from Britain, America and Sweden have also indicated 30% to 52% of the prisoners are dyslexic, implying that most of them are mistreated by teachers in schools (Becroft, 2004), and therefore there is a need to look into teachers' knowledge and attitude towards students with dyslexia. For teacher training, since the Integrated Education has not been promoted for so many years, many in-service teachers did not receive training during undergraduate studies. However, pre-service teachers, who study in teacher education programs but have not completed specific requirements to be qualified as teachers, do (Casarez, Stevens, Siwatu & Cain, 2013; Gonzalez & Frumk, 2016). From what has been discussed, it proves that pre-service teachers' knowledge, attitude and training towards students with dyslexia are essential in developing relevant inclusive practices while education programs in universities play a significant role in equipping pre-service teachers with these qualities (Beacham & Rouse, 2012).

However, from previous research, many pre-service teachers in the western world still found limited support from the government for information, training and support (Gwernan-Jones & Burden, 2010; Hornstra, Denessen, Bakker, Bergh & Voeten, 2010). When teachers do not have much access to relevant information and support related to dyslexia, a sense of learned helplessness would develop which would adversely influence how much support teachers can

provide to dyslexic students (Ade-Ojo, 2011; Kerr, 2001). According to the Education Bureau (2015b), at least 15%-25% teachers in each school should attend a 30-hour basic course educating them some basic teaching strategies, curriculum and assessment to cater for learning diversity. If '30 hours' is a benchmark to indicate that pre-service teachers are well-trained to accommodate students with different learning needs, the compulsory course named SED3001 School Guidance and Managing Diversity with 39 contact hours for students studying in The Education University of Hong Kong (EdUHK) seems to be enough. Still, it is worth exploring how effective the course is to prepare pre-service teachers to teach in regular classrooms with SEN students.

Therefore, this research aims to investigate Hong Kong pre-service teachers' knowledge, attitude and training towards students with dyslexia to discuss the relationship between the three items and to make recommendations to improve the current practices.

2. Literature Review

2.1 Pre-service teachers' knowledge towards students with dyslexia

This study examines how much pre-service teachers know about students with dyslexia, aiming at identifying the common misconceptions about dyslexic students, so that some measures could be recommended in a later stage.

Washburn, Binks-Cantrell and Joshi (2014) conducted a questionnaire to compare pre-service teachers' knowledge about dyslexia in Britain and America, and the participants indicated their responses through a Likert-type scale, ranging from 'definitely true' to 'definitely false'.

Pre-service teachers from the two countries had a shared piece of accurate knowledge about dyslexia which was 'dyslexia is not caused by home environment' (Washburn et al., 2014).

However, most of the shared knowledge between the pre-service teachers from the two countries was misunderstandings and misconceptions about dyslexia. Some instances were that participants responded ‘definitely true’ and ‘probably true’ to the items ‘dyslexia is caused by a deficit in visual perception’ and ‘dyslexia is characterized by letter reversals’ (Washburn et al., 2014). These misconceptions seems to be prevailing among many pre-service teachers as well as in-service teachers but could not be explained with regard to the educational cultures in different places (Allington, 1982; Wadlington & Wadlington, 2005). Therefore, it is implied that Hong Kong pre-service teachers may know even little than those in Britain and America because both countries have been protecting students with dyslexia with laws and policies and recognizing the need for teachers who are highly-qualified, experienced and specialized to teach dyslexic students (Washburn et al., 2014).

Another study by Elias (2014) also conducted a questionnaire to see how much pre-service teachers know about dyslexia in New Zealand. It revealed similar results with Washburn’s study (2014); however, one more interesting thing was discovered because of the difference in the questionnaire design. Unlike Washburn’s study (2014), the questionnaire provided the respondents with 4 options but one option was actually a combination of two of the other options (both options a and b). One question was ‘dyslexia refers to...’ where option b (difficulty with written language) and option c (learning sequence of letters, syllables and numbers) should be the optimal answers; however, most of the participants chosen option d (both options a and b) (Elias, 2014). This reveals that participants did the questionnaire depending on some general knowledge and did not really know specific characteristics about dyslexia. Therefore, it seems that there is a need to provide more information to pre-service teachers on dyslexia.

2.2 Pre-service teachers' attitude and training towards students with dyslexia

Since pre-service teachers' attitude has a significant effect on students with dyslexia, not only on the academic success but also on the psychological development, like depression (Macdonald, 2009), it is meaningful to investigate pre-service teachers' acceptability towards students with dyslexia in Hong Kong.

Gwernan-Jones and Burden (2010) conducted a questionnaire for pre-service teachers in both primary and secondary schools in the United Kingdom to see how they perceived dyslexic students. The results showed that the two group of teachers held positive attitude on the helpfulness of the concept 'Dyslexia' and felt assured in their ability in supporting dyslexic students, which were also found in other related studies (Gwernan-Jones & Burden, 2010; Hornstra et al., 2010).

Besides, there was an implication that a bunch of newly-qualified teachers may work positively with students with dyslexia (Gwernan-Jones & Burden, 2010). This could be explained in relation to the Theory of Planned Behaviour (TPB). According to Ajzen (1985), if dyslexia is put the TPB model, it will suggest that pre-service teachers who have completed the teaching training programs with teaching practicum will enter the teaching profession with some intentions performing towards students with dyslexia with regard to their attitude towards the presence of dyslexia, which will then be linked to what they recognize as the normative views within a teaching profession. Since pre-service teachers have gone through teacher training programs and gained understandings of dyslexic children, a positive set of behavioural beliefs and values on dyslexia are developed and the normative attitudes would be reformulated, and therefore pre-service teachers normally have a strong sense of perceived

behavioural control which affects their intentions to act positively towards dyslexic students (Ajzen, 1985; Gwernan-Jones & Burden, 2010).

However, what needs to be aware is the effectiveness of the support and trainings provided to pre-service teachers. Although most of the respondents felt confident about dealing with dyslexic students, they did express that there should have been more training sessions provided to equip them with effective intervention and coping strategies (Gwernan-Jones & Burden, 2010; Hornstra et al., 2010). As a result, it is implied that the support is not enough in the current practices and it is recommended that an induction year involving supplemented modules, ways to help with students with dyslexia without any stigmatization in particular, for a Master's degree program, should be included in the undergraduate level teaching training programs (Gwernan-Jones & Burden, 2010).

In short, after reviewing pre-service teachers' knowledge, attitude and training towards students with dyslexia, it is shown that the context of all the previous studies is in the western world and it would be valuable to have an investigation on pre-service teachers in an Asian context, Hong Kong.

3. Research Questions and Hypotheses

The purpose of this research is to explore Hong Kong pre-service teachers' knowledge, attitude and training towards students with dyslexia and to make some recommendations on the current practices. In order to achieve the aim of this research, three research questions are explicated with hypotheses:

1. What knowledge and / or misunderstandings and misconceptions do Hong Kong pre-service teachers have about dyslexia?

Hypothesis: Hong Kong pre-service teachers will have a lot more misunderstandings and misconceptions than knowledge (accurate descriptions).

2. How do Hong Kong pre-service teachers perceive students with dyslexia?

Hypothesis: Most of the Hong Kong pre-service teachers tend to perceive students with dyslexia in a positive way.

3. What training do Hong Kong pre-service teachers receive about dealing with students with dyslexia? How effective is the training?

Hypothesis: Hong Kong pre-service teachers (English Language Education students from EdUHK in the research) receive limited training by taking the compulsory course SED3001 and find it effective to a certain extent only.

4. Methodology

4.1 Participants

This study used purposive sampling method to choose participants for both the questionnaire and the interview. In this research, participants were final year students from the English Language Education program at EdUHK because they had the teaching practicum from August to December 2018, during which they could apply and evaluate what they have learnt from the compulsory course SED3001 and see if it is effective enough or more training is needed. Besides, the reason for choosing English Language as the focus is that it requires students to do plenty of reading and writing work, and among the four core subjects in the Hong Kong Diploma of Secondary Education (HKDSE) in 2014, the passing rate of English

Language SEN students got was the worst, only 47.1% (Legislative Council, 2014).

Therefore, it will be meaningful to investigate if English pre-service teachers have been equipped with certain skills to help dyslexic students throughout the five years of undergraduate studies.

Regarding the sample size for the questionnaire, the following formula was adopted and shown as follows.

Figure 1. The formula for calculating the sample size for the questionnaire

$$\text{Sample Size} = \frac{\frac{z^2(p)(1-p)}{c^2}}{1 + \frac{\frac{z^2(p)(1-p)}{c^2} - 1}{N}}$$

z = z value (confidence level)

p = percentage picking a choice (expressed as decimal)

c = confidence interval (expressed as decimal)

N = population size

The formula is from <https://www.surveysystem.com/sample-size-formula.htm>.

As suggested by Cohen, Manion and Morrison (2007), a traditional sampling strategy would be to use a 95% of confidence level (1.96 as the z value), a 3% of confidence interval and a 5% picking a choice, and the total number of students in the cohort is 100, and therefore the calculations would be demonstrated in the following.

Figure 2. The calculations of the sample size for the questionnaire

$$\begin{aligned} \text{Sample Size} &= \frac{\frac{(1.96)^2(0.5)(1 - 0.5)}{(0.03)^2}}{1 + \frac{\frac{(1.96)^2(0.5)(1 - 0.5)}{(0.03)^2} - 1}{100}} \\ &= \frac{1067.111111}{1 + \frac{1067.111111 - 1}{100}} \\ &= 91.5 \end{aligned}$$

Eventually, there were 92 participants for the questionnaire, with 14 male and 78 female participants and they were required to complete three different sections regarding their knowledge, attitude and training towards students with dyslexia in the questionnaire. By referring to participants' responses from the questionnaire in the last section about training received towards students with dyslexia, 6 participants, with 2 male and 4 female participants, were chosen to do the interview and they explained much deeper about what training they have received at EdUHK throughout the five years and critically evaluated the effectiveness of the training.

4.2 Instruments

4.2.1 Questionnaire

In the questionnaire (See Appendix 1), there are three major sections regarding pre-service teachers' knowledge, attitude and training towards students with dyslexia where the first two are adapted from the studies conducted by Elias (2014) and Gwernan-Jones and Burden (2010). The first section concerns the knowledge about dyslexia where the main question type is categorization. There is a total of eight statements and the

participants were provided with four options for the first two questions and two options (True or False) for the remaining six.

The second part is about the attitude towards dyslexic students. Participants needed to indicate their views on twelve statements using a Likert-type scale, ranging from ‘Strongly Agree’ to ‘Strongly Disagree’. The questions are set in order to collect information about five key aspects of dyslexia related to attitudes as recommended in studies by Elias (2014) and Gwernan-Jones and Burden (2010):

1. The power of pre-service teachers’ beliefs about the existence of dyslexia, either positive or negative, as measured by Questions 1 and 2;
2. Pre-service teachers’ views on the universal connotations of the use of the term ‘dyslexia’, as measured by Questions 3 to 5;
3. Pre-service teachers’ views on the possible efficacy or helplessness suggested by the label ‘dyslexia’, as measured by Questions 6 to 8;
4. Pre-service teachers’ expectations about reactions from parents to the use of the term ‘dyslexia’ to describe their child’s obstacles, as measured by Questions 9 and 10;
5. Pre-service teachers’ sense of competence in providing support to dyslexic students, as measured by Questions 11 and 12.

The last section focuses on the training towards dyslexia. Participants were asked one open-ended question on what kinds of training they have received so that suitable participants were easily sorted out who provided a lot more insights during the interview.

For the results in the first two sections, the analyses were carried out by Statistical Package for the Social Sciences (SPSS) and the responses were coded with marks, so that mean scores were to be generated to see an overview among the participants. Besides, the differences in the mean scores between male and female participants were tested using independent-samples t-test where the alpha error was set at $p < .05.$, and the relationship between scores in knowledge and attitude was tested using correlation where the alpha error was set at $p < .01.$

For the last section, the written responses were analyzed together with the transcriptions of the interview for the training received towards dyslexic students.

4.2.2 Interview

The interview aims to know more about training the chosen 6 participants have received at EdUHK. It was an individual and semi-structured interview which lasted for twenty to thirty minutes. There are a set of pre-set questions with some follow-up questions depending on the interviewees' responses, and the interviews were audio-recorded for doing analyses (See Appendix 2).

For the qualitative data obtained from the interview, relevant parts of the recordings were transcribed for easier retrieval and analysis. The transcriptions were analyzed together

with the results from the last section in the questionnaire to draw significant discussions on the effectiveness of the training received and the suggestions for improvement in the future.

5. Results and Discussions

An analysis on the data obtained from the questionnaire was carried out with the use of SPSS to quantify the responses on pre-service teachers' knowledge and attitude to calculate the corresponding mean scores, to explore the differences in the mean scores between male and female pre-service teachers and to investigate the relationship between the two variables, knowledge and attitude. Pie charts and tables were also used to show the frequencies of every question and to compare and contrast the questions under the same section.

An analysis on the data obtained from the interviews was made by transcribing the relevant parts in the audio files to explore the training pre-service teachers received, to evaluate the effectiveness of the training and to make recommendations for further improvement.

In the following, discussions on pre-service teachers' knowledge and attitude towards students with dyslexia would be made first, followed by one on pre-service teachers' training.

5.1 Pre-service teachers' knowledge towards students with dyslexia

In order to explore pre-service teachers' knowledge towards dyslexic students, participants were required to give an answer (a, b, c, d or True, False) to eight questions concerning some pieces of knowledge and related concepts about dyslexia and dyslexic students. They were awarded 1 mark for a correct answer and 0 mark for an incorrect one and their scores were

calculated to check their degree of comprehension and to have an overview among them. The full mark of the knowledge part is 8.

Table 1. Frequencies and mean knowledge score of pre-service teachers

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean Score
Pre-service teachers' knowledge score	0.00	0	0	0	0	3.55
	1.00	3	3.3	3.3	3.3	
	2.00	14	15.2	15.2	18.5	
	3.00	29	31.5	31.5	50.0	
	4.00	26	28.3	28.3	78.3	
	5.00	15	16.3	16.3	94.6	
	6.00	5	5.4	5.4	100.0	
	7.00	0	0	0	100.0	
	8.00	0	0	0	100.0	
	Total	92	100.0	100.0		

Table 1 illustrates the distribution of pre-service teachers' knowledge score where the highest score and the lowest score were 6 and 1 respectively. As shown in the table, 50% (46 out of 92) of the pre-service teachers got 3 marks or below, which was a fail in this part whereas another 50% (46 out of 92) got 4 marks or above, which was a pass. Although it seemed that they did not perform extremely bad, the total mean score of 3.55, being lower than 4, reflected the actual situation which indicates that they had much more misconceptions and misunderstandings than accurate descriptions of dyslexia in general.

5.1.1 *Differences in the mean score between male and female pre-service teachers*

Table 2. Mean knowledge score of male and female pre-service teachers

Gender	Mean	N	Std. Deviation
Male	3.6429	14	1.44686
Female	3.5385	78	1.14747
Total	3.5543	92	1.18937

Table 3. Independent-samples t-test between gender and pre-service teachers' knowledge score

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Pre-service Teachers' Knowledge Score	Equal variances assumed	1.758	.188	.301	90	.764

Table 2 shows the mean knowledge score of male and female pre-service teachers and it revealed that male pre-service teachers' score was slightly higher than that of female ones (3.64 > 3.53). An independent-samples t-test was carried out to compare the comprehension degree of male and female pre-service teachers; however, there was no significant difference between male and female pre-service teachers because the p-value was .764 > .05 as shown in Table 3. Therefore, the results imply that it is not possible to generalize the trend to the population and it happened by chance.

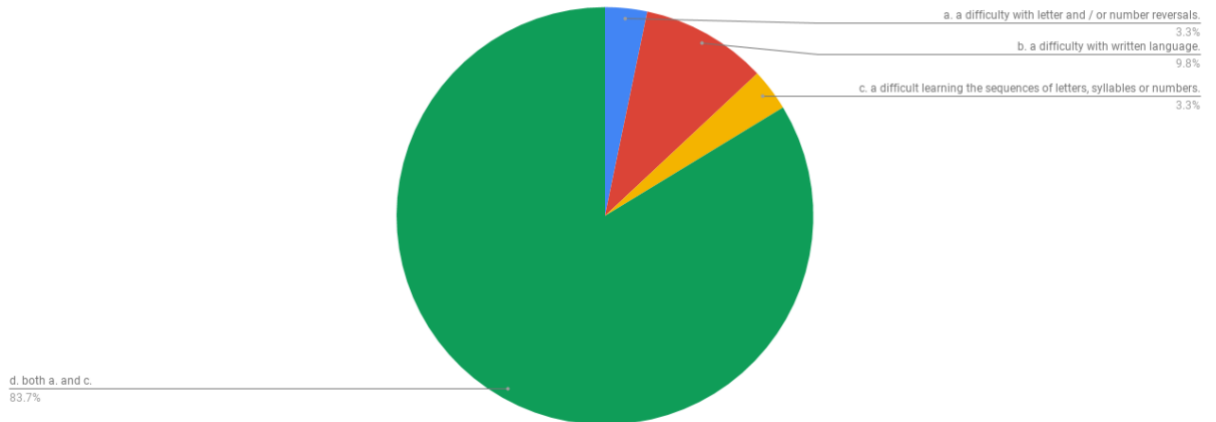
5.1.2 *Discussions on the misconceptions of pre-service teachers*

Among the results of the eight questions concerning pre-service teachers' comprehension degree on dyslexia, 5 of them were found to be misconceptions and misunderstandings,

and 3 of them will be discussed in the following, which appeared to be the most significant ones.

Graph 1. 1. 'Dyslexia' primarily refers to:

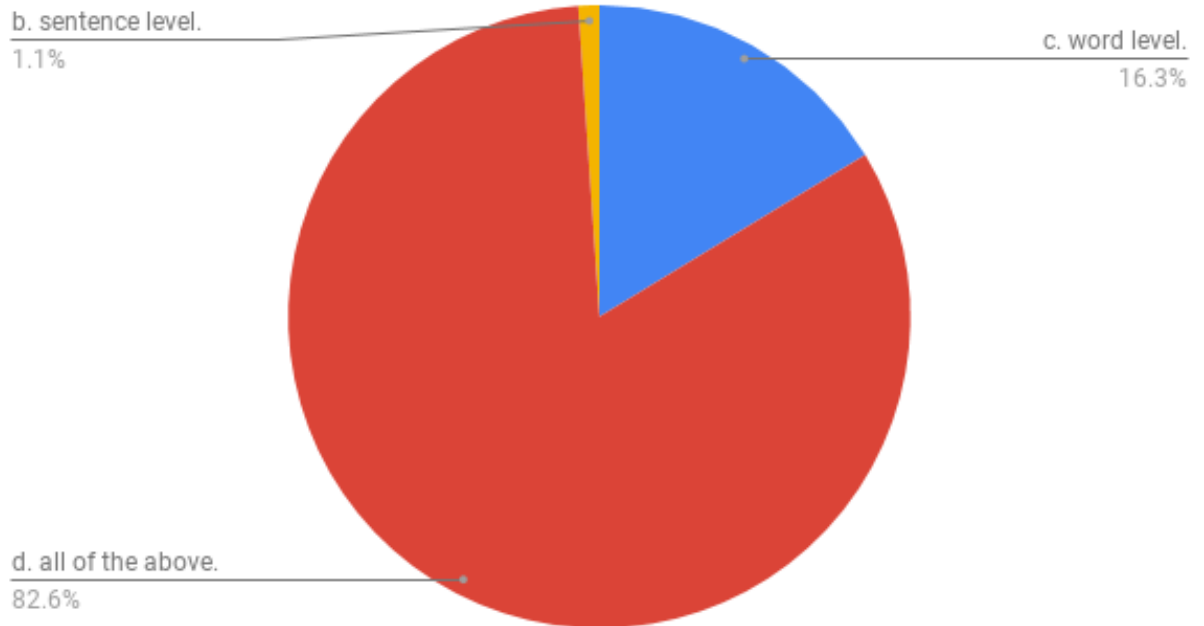
1. 'Dyslexia' primarily refers to:



The results of Graph 1 show that about 84% of the pre-service teachers believed that dyslexia primarily refers to both a difficulty with letter or number reversals and a difficulty learning the sequences of letters, syllables or numbers. However, the most optimal answers should either be option b or option c while most of them could not get it correct. From their choices, it reflected that they were over dependent on their general knowledge to determine the correctness of a technical term because of a lack of strong foundation on concepts under dyslexia (Elias, 2014). Besides, they put an overt emphasis on the dyslexic students' inability of reading but ignored their inability of writing (Elias, 2014). It is inferred that pre-service teachers might not acquire a comprehensive view of dyslexia from the teaching training program, causing them to have flaws and confusions among all other concepts in dyslexia.

Graph 2. 2. Dyslexia is characterized by difficulty at:

2. Dyslexia is characterised by difficulty at:



From Graph 2, it indicates that about 83% of the pre-service teachers agreed that dyslexia is characterized by all three levels, including word, sentence and text levels. However, dyslexia is defined as a person's impaired ability to recognize words, to spell isolated words accurately and to read separated words fluently, and all these are highly related to and based on the word level only (EDB, 2010; IDA, 2014; Lyon, Shaywitz & Shaywitz, 2003; Petscher, Fien, Stanley, Gearin, Gaab, Fletcher & Johnson, 2019; Peterson & Pennington, 2015; Washburn et al., 2014). It does not mean that dyslexic students do not have problems when it comes to the sentence and text levels but this is only the secondary impact which is brought by being incapable to recognize words at first, and therefore the sentence and text levels are not the characterization and roots of dyslexia (Petscher et al., 2019; Undheim, 2003). It is implied that pre-service teachers kept overgeneralising and mixing up the related pieces of knowledge about dyslexia without a sufficient knowledge bank (Elias, 2014).

Graph 3. 5. A person who is dyslexic is more likely to also have ADHD, dyspraxia and / or specific language impairment than a non-dyslexic person.

5. A person who is dyslexic is more likely to also have ADHD, dyspraxia and / or specific language impairment than a non-dyslexic person.



As expressed in Graph 3, about 57% of the pre-service teachers disagreed that a person who is dyslexic is more likely to also have other disabilities, like ADHD, dyspraxia and specific language impairment than a non-dyslexic person. Although it might show that they held a positive attitude towards dyslexic students and had faith in them, it is at odds with research evidence. Research studies have shown that there is a co-occurrence of interrelated disabilities among dyslexics. For example, about 30% of dyslexic children also have ADHD where the conditions of and the intervention strategies for dyslexia and ADHD are totally different (Elias, 2014; IDA, 2014; Washburn et al., 2014). Besides, dyslexic children may trouble with other kinds of specific impairment, like dysgraphia, which focuses on either mechanical or processing writing, and dyscalculia, which concerns mathematical operations (Washburn et al., 2014). It is demonstrated that pre-service teachers were trying to be positive towards dyslexic students' ability but they

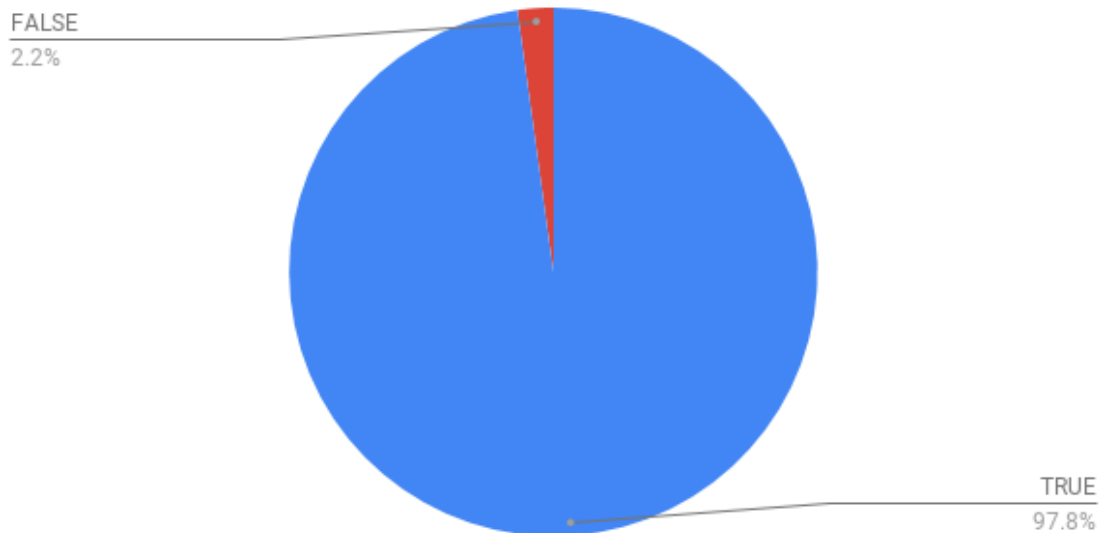
neglected the proven facts of related disorders occurred on dyslexic students simultaneously.

5.1.3 Discussions on the accurate descriptions (knowledge) of pre-service teachers

After discussing the misconceptions and misunderstandings pre-service teachers made in the questionnaire, it is also worth exploring what they know about dyslexic students and dyslexia. Among all eight questions, 3 of them were found to be accurately identified and will be discussed in the following.

Graph 4. 8. Multi-sensory teaching methods are considered to be particularly helpful to dyslexic pupils.

8. Multi-sensory teaching methods are considered to be particularly helpful to dyslexic pupils.

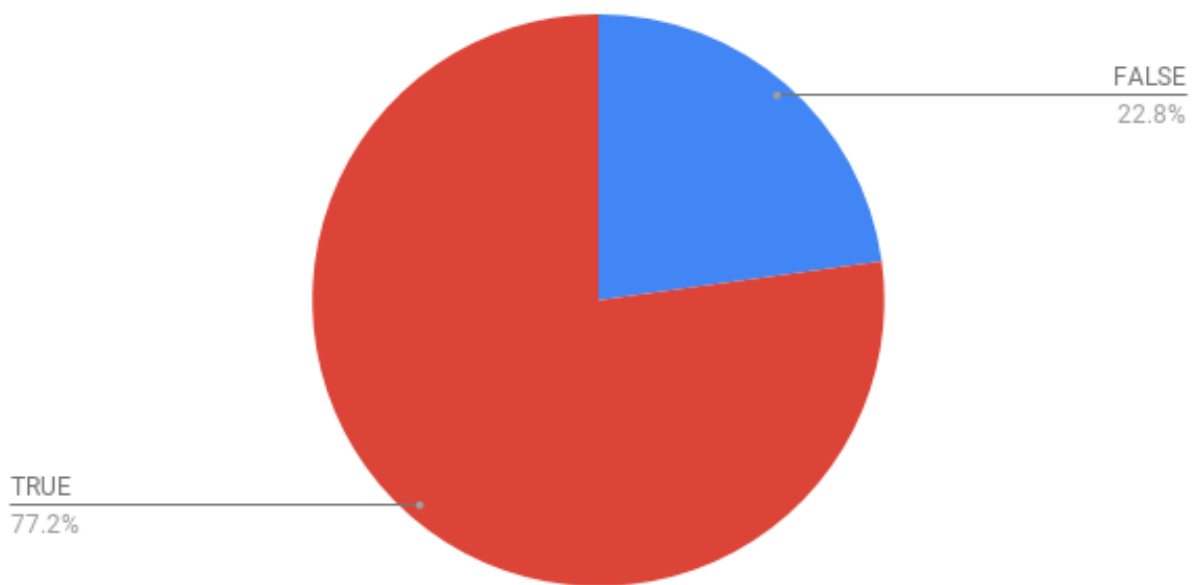


From Graph 4, it displays that about 98% of the pre-service teachers were consented that multiple-sensory teaching methods are considered to be helpful to dyslexic pupils and this aligns with research evidence. According to Kamala (2014), multi-sensory teaching methods work for dyslexic students because they make use of as many senses as possible

to enhance both the teaching and learning processes. When students are asked to utilise more than one sense in a lesson, their capabilities to acquire knowledge can be improved and increased in a better way, which makes dyslexic students much more able to learn (Kamala, 2014). From what has been discussed, pre-service teachers seemed to pay more attention to the intervention strategies which can provide dyslexic students with the greatest benefit.

Graph 5. 4. Difficulties with fluency and automaticity are common in dyslexia.

4. Difficulties with fluency and automaticity are common in dyslexia.

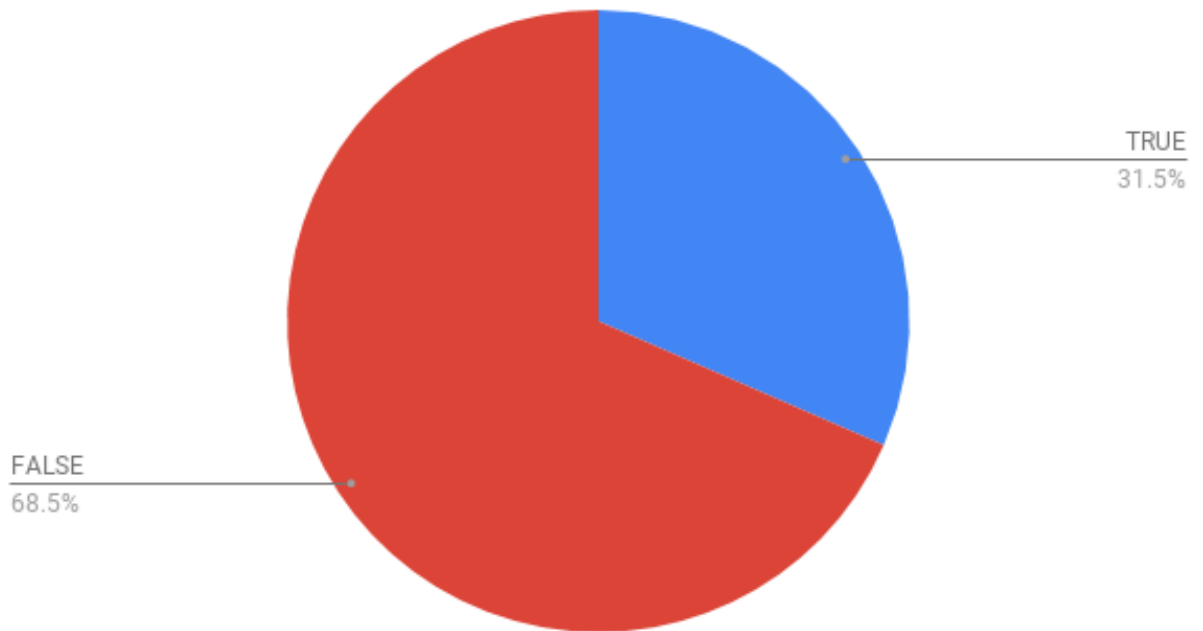


As shown in Graph 5, about 77% of the pre-service teachers held a positive view towards the idea that difficulties with fluency and automaticity are common in dyslexia and this shows that the teachers were more familiar with the cognitive nature of dyslexia. Several research studies demonstrated the concepts of automaticity and fluency as ‘if a person who is not able to making word-reading an automatic skill may have an extra deficit in dyslexia, resulting in even slower word recognition process’, and this has proved that it is

a common phenomenon among all dyslexic students (Savage, 2004; Wolf & Bowers, 1999). Besides, other related studies explained that poor phonological awareness and nonsense reading are positively-correlated with weak automaticity and fluency, and therefore dyslexia is highly related to automaticity and fluency with the support of evidences (Savage, 2004). It is shown that pre-service teachers were more aware of the cognitive development of dyslexic students.

Graph 6. 3. Dyslexia is not heritable.

3. Dyslexia is not heritable.



The results of Graph 6 indicate that about 69% of the pre-service teachers did not believe that dyslexia is not heritable and they seemed to be aware of the neurological nature of dyslexia. In fact, family clustering in dyslexia have been identified since 1895 and it was found that a child would have a risk of 40% to 60% suffering from dyslexia if he has dyslexic parents (Schumacher, Hoffmann, Schmäi, Schulte-Körne & Nöthen, 2007; Shaywitz, 2003). Besides, the highest reported inherited factors which involves in the

development of dyslexia are word reading as well as spelling, with 58% and 70% respectively, and therefore all these have proven the inheritability of dyslexia and the positive correlation between parents and children (Schumacher et al., 2007).

In short, pre-service teachers had more misconceptions and misunderstandings than pieces of accurate knowledge. They tended to be more interested in knowing about both the cognitive and neurological natures of dyslexia as well as intervention strategies to help dyslexic students but less interested in exploring the symptoms and characterization of dyslexia.

5.2 *Pre-service teachers' attitude towards students with dyslexia*

To achieve the aim of finding out pre-service teachers' attitude towards students with dyslexia, participants were asked to indicate their views on twelve statements on five key aspects of dyslexia relevant to attitude using a Likert-type scale, ranging from 'Strongly Agree' to 'Strongly Disagree'. They were awarded 1 mark for the most negative view and 5 marks for the most positive one. Since there are some negatively-written questions, the scores of which were reversed before doing the analysis. The scores were calculated and displayed with regard to every single aspect to check pre-service teachers' positivity towards dyslexia.

Table 4. Mean attitude score of pre-service teachers in every aspect

		Attitude Score of Aspect 1 (Q1 - Q2)	Attitude Score of Aspect 2 (Q3 - Q5)	Attitude Score of Aspect 3 (Q6 - Q8)	Attitude Score of Aspect 4 (Q9 - Q10)	Attitude Score of Aspect 5 (Q11 - Q12)
Total	Mean	8.5870	12.0652	11.0109	6.8261	7.3804
	Mean per question	4.2935	4.02173	3.6703	3.41305	3.6902
	N	92	92	92	92	92
	Std. Deviation	1.31058	1.93183	1.68702	1.59400	1.11771

Table 4 illustrates the mean attitude score of pre-service teachers where the mean scores of all five aspects were more than a neutral stance (> 3), with the first two being very positive (> 4). The aspect being indicated to be the most positive was related to pre-service teachers' beliefs and views on the presence of dyslexia, with a mark of 4.29; the second positive aspect concerned pre-service teachers' opinions on the universal connotations of the term 'dyslexia', with a mark of 4.02. The aspects on pre-service teachers' views on the efficacy advocated by the label 'dyslexia' and their sense of competence in supporting dyslexic students' learning shared a similar score, with marks of 3.67 and 3.69 respectively. The least positive aspect was associated with pre-service teachers' anticipations about parents' reactions to the use of the term 'dyslexia' to label their children difficulties, with a mark of 3.41.

5.2.1 Differences in the mean score between male and female pre-service teachers

Table 5. Mean attitude score of male and female pre-service teachers

Gender		Attitude Score of Aspect 1 (Q1 - Q2)	Attitude Score of Aspect 2 (Q3 - Q5)	Attitude Score of Aspect 3 (Q6 - Q8)	Attitude Score of Aspect 4 (Q9 - Q10)	Attitude Score of Aspect 5 (Q11 - Q12)
Male	Mean	8.7143	12.1429	11.0000	7.0000	7.2857
	N	14	14	14	14	14
	Std. Deviation	.91387	1.51186	1.66410	1.35873	.91387
Female	Mean	8.5641	12.0513	11.0128	6.7949	7.3974
	N	78	78	78	78	78
	Std. Deviation	1.37312	2.00582	1.70175	1.63849	1.15477

Table 6. Independent-samples t-test between gender and pre-service teachers' attitude score

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2- tailed)
Attitude Score of Aspect 1 (Q1 - Q2)	Equal variances assumed	3.842	.053	.393	90	.695
Attitude Score of Aspect 2 (Q3 - Q5)	Equal variances assumed	.717	.399	.162	90	.871
Attitude Score of Aspect 3 (Q6 - Q8)	Equal variances assumed	.013	.908	-.026	90	.979
Attitude Score of Aspect 4 (Q9 - Q10)	Equal variances assumed	.427	.515	.441	90	.660
Attitude Score of Aspect 5 (Q11 - Q12)	Equal variances assumed	.681	.412	-.343	90	.733

Table 5 shows the mean attitude score of male and female pre-service teachers and it revealed that male pre-service teachers were more positive than female teachers in general. Male pre-service teachers held a more positive attitude than female ones in terms of Aspect 1 (8.71 > 8.56), Aspect 2 (12.14 > 12.05) and Aspect 4 (7 > 6.79) whereas female pre-service teachers showed a higher positivity with regards to Aspect 3 (11.01 > 11) and Aspect 5 (7.39 > 7.29). An independent-samples t-test was carried out to compare the views on different aspects of dyslexia from male and female pre-service teachers; however, there were no significant differences between male and female pre-service teachers in all five aspects because all the p-values were larger than .05 (Aspect 1: .695; Aspect 2: .871; Aspect 3: .979; Aspect 4: .660; Aspect 5: .733) as shown in Table 6. Therefore, the results suggest that it is not possible to generalize the trend to the population and it happened by chance.

5.2.2 Discussions on pre-service teachers' views on every aspect

The results of pre-service teachers' attitude towards students with dyslexia can be interpreted and made sense with the aid of the Theory of Planned Behavior (TPB) suggested by Ajzen (1985). In the following, discussions on the five aspects related to pre-service teachers' attitude would be made one by one.

Table 7. *Attitude Score 1: I think dyslexia is a myth.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers' response	Strongly Agree	1	1.1	1.1	1.1	M = 4.14 F = 3.96 T = 3.99
	Agree	7	7.6	7.6	8.7	
	Neutral	18	19.6	19.6	28.3	
	Disagree	32	34.8	34.8	63.0	
	Strongly Disagree	34	37.0	37.0	100.0	
Total		92	100.0	100.0		

Table 8. *Attitude Score 2: The word 'dyslexia' is really just an excuse for laziness.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers' response	Strongly Agree	1	1.1	1.1	1.1	M = 4.57 F = 4.60 T = 4.60
	Agree	0	0.0	0.0	1.1	
	Neutral	2	2.2	2.2	3.3	
	Disagree	29	31.5	31.5	34.8	
	Strongly Disagree	60	65.2	65.2	100.0	
Total		92	100.0	100.0		

The first aspect concerns pre-service teachers' beliefs about the existence of and the implications drawn about dyslexia. The results in Table 7 display that over 70% of the pre-service teachers disagreed (34.8%) and strongly disagreed (37%) with the statement 'I think dyslexia is a myth'; similarly, in Table 8, the vast majority (over 96%) of the pre-

service teachers disagreed (31.5 %) and strongly disagreed (65.2 %) with the statement ‘the word dyslexia is really just an excuse for laziness’, and therefore it is proven that pre-service teachers were convinced to acknowledge the fact that dyslexia actually exists and to dismiss dyslexia as a reason for sheer laziness (Gwernan-Jones and Burden, 2010). In relation to TPB, the positive beliefs on dyslexia are strongly established and developed for this group of pre-service teachers because the normative attitudes have been reformulated with the education received (Ajzen, 1985; Gwernan-Jones and Burden, 2010). Although the differences between male and female pre-service teachers were not significant, it is concluded that male pre-service teachers tended to be a lot more positive in this aspect.

Table 9. *Attitude Score 3: Dyslexic students often do not succeed as adults.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers' response	Strongly Agree	0	0.0	0.0	0.0	M = 4.64
	Agree	0	0.0	0.0	0.0	F = 4.38
	Neutral	3	3.3	3.3	3.3	T = 4.42
	Disagree	47	51.1	51.1	54.3	
	Strongly Disagree	42	45.7	45.7	100.0	
	Total	92	100.0	100.0		

Table 10. *Attitude Score 4: Usually dyslexic students have low ability.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers' response	Strongly Agree	0	0.0	0.0	0.0	M = 4.07
	Agree	5	5.4	5.4	5.4	F = 4.06
	Neutral	11	12.0	12.0	17.4	T = 4.07
	Disagree	49	53.3	53.3	70.7	
	Strongly Disagree	27	29.3	29.3	100.0	
	Total	92	100.0	100.0		

Table 11. *Attitude Score 5: Calling a student ‘dyslexic’ makes it sound as if he / she has a problem that cannot be cured.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers’ response	Strongly Agree	3	3.3	3.3	3.3	M = 3.43 F = 3.60 T = 3.58
	Agree	19	20.7	20.7	23.9	
	Neutral	11	12.0	12.0	35.9	
	Disagree	40	43.5	43.5	79.3	
	Strongly Disagree	19	20.7	20.7	100.0	
Total		92	100.0	100.0		

Tables 9-11 are associated with the second aspect which is about pre-service teachers’ views on the implications from using the term ‘dyslexia’. From Table 9, over 96% of the pre-service teachers disagreed (51.1%) or strongly disagreed (45.7%) with the claim that ‘dyslexic students often do not succeed as adults’. A slightly lower, but still considerable number of pre-service teachers (82.6%) disagreed (53.3%) or strongly disagreed (29.3%) with the declaration that ‘usually dyslexic students have low ability’ as indicated in Table 10. However, in Table 11, only 64.2% of the pre-service teachers disagreed (43.5%) or strongly disagreed (20.7%) ‘calling a student dyslexic makes it sound as if he has a problem that cannot be cured’, with 24% showing agreement to the statement. According to Gwernan-Jones and Burden (2010), many researchers and practitioners working in the field always question themselves about the possibility to get dyslexic students cured and prefer discussing more on how to alleviate the current situations. From this piece of research evidence, a more thoughtful approach of the pre-service teachers who agreed with the claim (more pessimistic) might align more with the reality than the majority who disagreed (more optimistic) (Gwernan-Jones and Burden, 2010). Again as in the first aspect, the mean scores of male and female pre-service teachers were not significantly

different, it is decided that male pre-service teachers tended to be a lot more positive in this aspect.

Table 12. *Attitude Score 6: The label 'dyslexia' can help a student know he / she is not lazy or stupid.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers' response	Strongly Agree	3	3.3	3.3	3.3	M = 3.29 F = 3.05 T = 3.09
	Agree	40	43.5	43.5	46.8	
	Neutral	24	26.1	26.1	72.9	
	Disagree	12	13.0	13.0	85.9	
	Strongly Disagree	13	14.1	14.1	100.0	
	Total	92	100.0	100.0		

Table 13. *Attitude Score 7: The label 'dyslexia' can help a teacher understand how to support the student.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers' response	Strongly Agree	20	21.7	21.7	21.7	M = 4.14 F = 4.06 T = 4.08
	Agree	62	67.4	67.4	89.1	
	Neutral	7	7.6	7.6	96.4	
	Disagree	3	3.3	3.3	100.0	
	Strongly Disagree	0	0.0	0.0	100.0	
	Total	92	100.0	100.0		

Table 14. *Attitude Score 8: The label ‘dyslexia’ can be an excuse for a student to stop trying.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers’ responses	Strongly Agree	2	2.2	2.2	2.2	M = 3.57 F = 3.90 T = 3.85
	Agree	11	12.0	12.0	14.1	
	Neutral	11	12.0	12.0	26.1	
	Disagree	43	46.7	46.7	72.8	
	Strongly Disagree	25	27.2	27.2	100.0	
	Total	92	100.0	100.0		

The third aspect is related to pre-service teachers’ presuppositions about the helpfulness of the label ‘dyslexia’. In Table 12, just over 46% of the pre-service teachers agreed (43.5%) or strongly agreed (3.3%) with the assertion that ‘the label dyslexia can help a student know he is not lazy or stupid while the label ‘dyslexia’ reached an agreement (67.4%) or strong agreement (21.7%) to the pre-service teachers as shown in Table 13; relatedly, more than 73% of the pre-service teachers disagreed (46.7%) or strongly disagreed (27.2%) the assumption that the label can be an excuse for the student to stop trying. The findings in this aspect are comparatively much more positive than other research studies and show that pre-service teachers developed the awareness of some potential dangers related to dyslexia’s application, like the statement in Table 14 (Gwernan-Jones and Burden, 2010). According to Kerr (2001), learned helplessness is defined that human beings, pre-service teachers in this study, would feel helpless and want to escape from facing the current situation, dealing with dyslexic students and their parents in this study; however, pre-service teachers demonstrated positive attitudes which is not positively-correlated with the theory. Being similar to the first two aspects, the mean scores of male and female pre-service teachers were very alike and they shared almost the same views in the aspect.

Table 15. *Attitude Score 9: Parents often want to call a child ‘dyslexic’ when he / she is just actually immature.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers’ responses	Strongly Agree	1	1.1	1.1	1.1	M = 3.50 F = 3.53 T = 3.52
	Agree	6	6.5	6.5	7.6	
	Neutral	43	46.7	46.7	54.3	
	Disagree	28	30.4	30.4	84.8	
	Strongly Disagree	14	15.2	15.2	100.0	
	Total	92	100.0	100.0		

Table 16. *Attitude Score 10: Parents want to call their child ‘dyslexic’ when actually he / she has low ability.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers’ responses	Strongly Agree	1	1.1	1.1	1.1	M = 3.50 F = 3.27 T = 3.30
	Agree	17	18.5	18.5	19.6	
	Neutral	36	39.1	39.1	58.7	
	Disagree	29	31.5	31.5	90.2	
	Strongly Disagree	9	9.8	9.8	100.0	
	Total	92	100.0	100.0		

Tables 15 and 16 reveal pre-service teachers’ assumptions about unmarked parental reactions to their children’s diagnosis of dyslexia. Comparing the responses in this aspect to other aspects, this is the aspect where a large proportion of the pre-service teachers were neutral to the statements ‘parents often want to call a child dyslexic when he is just actually immature’ and ‘parents want to call their child dyslexic when actually he has low ability’, with 46.7% and 39.1% respectively as shown in Tables 14 and 15. Pre-service teachers had no confidence in choosing the correct position to stand as shown in other related studies (Gwernan-Jones and Burden, 2010). This can be explained by two

common phenomena found in school settings: teachers lack deep understandings about the nature of dyslexic issues and this seems to be justified with regard to the pre-service teachers' mean knowledge score (< 4); there is a lack of mutual and trust between teachers and parents of dyslexic children (Griffiths, Norwich & Burden, 2004). Although the mean scores of male and female pre-service teachers were not notably different, it is concluded that male pre-service teachers seemed to be more positive when dealing with the parental reactions.

Table 17. *Attitude Score 11: I feel confident I could support a dyslexic student's learning.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers' responses	Strongly Agree	3	3.3	3.3	3.3	M = 2.71
	Agree	15	16.3	16.3	19.6	F = 2.87
	Neutral	45	48.9	48.9	68.5	T = 2.85
	Disagree	23	25.0	25.0	93.5	
	Strongly Disagree	6	6.5	6.5	100.0	
	Total	92	100.0	100.0		

Table 18. *Attitude Score 12: I feel more training should be given to teachers about dyslexia.*

		Frequency	Percent	Valid Percent	Cumulative Percent	Mean
Pre-service teachers' responses	Strongly Agree	57	62.0	62.0	62.0	M = 4.57
	Agree	30	32.6	32.6	94.6	F = 4.53
	Neutral	2	2.2	2.2	96.8	T = 4.53
	Disagree	3	3.3	3.3	100.0	
	Strongly Disagree	0	0.0	0.0	100.0	
	Total	92	100.0	100.0		

The last aspect is associated with pre-service teachers' self-efficacy and competence level to support dyslexic students' learning. Although the mean score in this aspect was not pretty low, with a mark of 3.69; however, more than 48% of the pre-service teachers were unsure whether they could support a dyslexic students' learning as shown in Table 17. Given that they were not confident about their capability, about 95% of the pre-service teachers agreed (32.6%) or strongly agreed (62%) that there is a need to receive more training related to dyslexia as indicated in Table 18. From the discussions above, although pre-service teachers seemed to avoid undergoing learned helplessness because of their positive attitudes, they, in fact, had no or uncertain confidence in providing support to dyslexic students, which is in contrast with Gwernan-Jones and Burden's study (2010).

In general, pre-service teachers seemed to be the most positive towards the three aspects of dyslexia, including the existence of dyslexia, the implications drawn from the term 'dyslexia' and their sense of competence in supporting dyslexic students' learning. What needs to be aware is that they actually doubted their ability to help dyslexic students and expressed to crave for more training to be received.

5.3 The relationship between pre-service teachers' knowledge and attitude towards students' with dyslexia

After doing discussions on the results of the questionnaire concerning pre-service teachers' knowledge and attitude towards students with dyslexia, it is worth studying the relationships between the two variables, and therefore an analysis on the correlation between the two factors was made using SPSS and the alpha error was set at $p < .01$.

Table 19. Correlations between pre-service teachers' knowledge and attitude towards students with dyslexia

		Pre-service Teachers' Knowledge Score	Attitude Score of Aspect 1 (Q1 - Q2)	Attitude Score of Aspect 2 (Q3 - Q5)	Attitude Score of Aspect 3 (Q6 - Q8)	Attitude Score of Aspect 4 (Q9 - Q10)	Attitude Score of Aspect 5 (Q11 - Q12)
Pre-service Teachers' Knowledge Score	Pearson Correlation	1	-.126	-.298**	-.085	.034	.038
	Sig. (2-tailed)		.230	.004	.419	.747	.719
	N	92	92	92	92	92	92
Attitude Score of Aspect 1 (Q1 - Q2)	Pearson Correlation	-.126	1	.371**	.101	.091	.288**
	Sig. (2-tailed)	.230		.000	.336	.386	.005
	N	92	92	92	92	92	92
Attitude Score of Aspect 2 (Q3 - Q5)	Pearson Correlation	-.298**	.371**	1	.125	.000	.258*
	Sig. (2-tailed)	.004	.000		.237	.999	.013
	N	92	92	92	92	92	92
Attitude Score of Aspect 3 (Q6 - Q8)	Pearson Correlation	-.085	.101	.125	1	-.089	.068
	Sig. (2-tailed)	.419	.336	.237		.398	.521
	N	92	92	92	92	92	92
Attitude Score of Aspect 4 (Q9 - Q10)	Pearson Correlation	.034	.091	.000	-.089	1	.247*
	Sig. (2-tailed)	.747	.386	.999	.398		.017
	N	92	92	92	92	92	92
Attitude Score of Aspect 5 (Q11 - Q12)	Pearson Correlation	.038	.288**	.258*	.068	.247*	1
	Sig. (2-tailed)	.719	.005	.013	.521	.017	
	N	92	92	92	92	92	92

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 19 illustrates the correlations between pre-service teachers knowledge and attitude in terms of the five aspects and three significant correlations are found with the p-value being < .01.

There is a statistically significant negative correlation between pre-service teachers' knowledge score and their attitude score on Aspect 2, the universal connotations of the term

‘dyslexia’, where the p-value was $.004 < .01$. This implies the higher the knowledge score, the more negative the attitude on Aspect 2; however, since the statements in Aspect 2 are negatively-written, both the scores of knowledge and attitude on Aspect 2 would go either positive or negative together.

Besides, there is a statistically significant positive correlation between pre-service teachers’ attitude scores on Aspect 1, the existence of dyslexia, and Aspect 2, the universal connotations of the term ‘dyslexia’, where the p-value was $.000 < .01$. This implies the attitudes and the scores on Aspects 1 and 2 would go either positive or negative together.

Moreover, there is a statistically significant positive correlation between pre-service teachers’ attitude scores on Aspect 1, the existence of dyslexia, and Aspect 5, the sense of competence in supporting dyslexic students, where the p-value was $.005 < .01$. This implies that the attitudes and the scores on Aspects 1 and 5 would go either positive or negative together. Nevertheless, since the questions in Aspect 1 are negatively-written, it infers the more negative the attitude on Aspect 1, the more positive the attitude on Aspect 5.

5.4 Pre-service teachers’ training towards students with dyslexia

To accomplish the aim of exploring pre-service teachers’ training towards students with dyslexia, 6 participants were chosen according to their responses in the questionnaire to do an interview for sharing deeper insights on the training received at EdUHK and their effectiveness, most importantly, suggestions for further arrangement. In the following, the discussion will be divided into three main parts, including training received at EdUHK, the experience in the teaching practicum and suggestions with relevant parts of the participants’ scripts being quoted.

5.4.1 Training received at EdUHK

The questions asked in the interview in this part were:

1. What training(s) do you receive from The Education University of Hong Kong (EdUHK) about dealing with students with dyslexia?
2. What have you learnt from the training(s), for instance, definition of dyslexia, definition of special learning difficulties, specific characteristics about dyslexic students, teaching strategies, etc?

The responses concerning the compulsory course (SED3001) were:

I think it is a foundation for all EdUHK students majoring in Education and it covers nearly all kinds of SENs, one of which is Dyslexia, and I have learnt some symptoms of dyslexic students, like having difficulty in word recognition, letter reversals, spelling, and so on.

Although it is a course focusing on SENs, I think it is too superficial and it mainly focuses on eliminating our misconceptions and discriminations against dyslexic students.

I think SED3001 covers a lot on theories and facts (dyslexic students' characteristics), for instance, no phonemic and phonological awareness, but it does not teach us a lot on teaching pedagogies and strategies dealing with students with dyslexia.

The responses concerning the voluntary scheme (Special Educational Needs

Empowerment Project) were:

Knowing a lot of theories is not enough so I decided to join this scheme to have more first-hand experience with SEN students and this scheme has several stages for us to be guided before the one-week placement. In the first three stages, they are similar to SED3001, lecture-based. There were different guest speakers to share their own experiences in dealing with SEN students and they did share a lot on teaching strategies and some are related to dyslexia, like using different colors to tell the number of syllables in an English word. And the one-week placement

has given me an experience in teaching dyslexic students and one skill I have learnt is demonstration. We have to write together with the kids.

Of course the lectures cover some symptoms and characteristics of dyslexic students but also teaching strategies. I have learnt that the multi-sensory approach and Total Physical Response are beneficial to dyslexic students because they employ a number of senses at the same time.

The response concerning the voluntary scheme (Special School Placement) was:

I joined the Special School Placement because I would like to have hands-on experience with SEN students. Although I did not receive any trainings before going to the placement, I did learn a lot from my supporting teacher during the three-week placement. At least, I learn that no matter what SEN students there are, one key thing a teacher should do is to control the class using props that can attract students' attention, so that they will focus on you and listen to your instructions.

Regarding the responses given by the participants, EdUHK, in fact, has provided a lot of learning opportunities and experiences to students who study Bachelor of Education programs. One compulsory course for all Education majors is SED3001 which corresponding students have to take it in Year 3 Semester 1 normally. In the course, students get to learn all kinds of special educational needs and dyslexia is only one of which. They will be taught a lot about the symptoms and characteristics of dyslexic students. For example, dyslexic students have no phonemic and phonological awareness, causing them to be much more difficult to recognize and decode a word. However, what has been pointed out is that the course itself is too superficial and theory-based and it lacks coverage on teaching strategies in which students are most interested.

Fortunately, EdUHK has also launched some voluntary schemes for students to participate in to gain a more comprehensive understanding of and, most importantly, teaching strategies for dyslexic students. Special Educational Needs Empowerment

Project was an example where students were given a short-term one-week placement to

some community centers or schools to get hands-on experience in teaching SEN students. Before the placement, they were required to undergo three stages which were like lectures in SED3001 but the major difference was that the speakers were really experts in dealing with particular kinds of SEN students and they did provide many useful ideas on catering for learning diversity in a classroom and dyslexic students' needs, for example, writing letters in different colours to help them spell English words, using transparent colour stripes or rulers to help them read without skipping lines, and using multimedia instead of just writing words to let students understand vocabulary items and concepts much more easily.

Special School Placement was another example where students were provided with an opportunity to conduct a three-week placement in local special schools. Although no training had been provided before the placement, the pieces of advice given by the supporting teacher were very convincing and useful and the exposure was much more enough than just taking the compulsory course.

In short, there are actually many learning opportunities for pre-service teachers at EdUHK to know more about SEN students and to get hands-on experience but the key is to be active in learning. Relying only on the compulsory course seems not to be enough to equip them with certain skills and knowledge to handle SEN students in the future.

5.4.2 *The teaching practicum*

The question asked in the interview in this part was:

1. How much can you apply what you have learnt during the teaching practicum?

The responses were:

I would say there were too many SEN students in my class and usually when there were chaos in the class, I could only manage the class without taking consideration of what specific SEN the students have. But I found some of my students dyslexic, I usually spent some time in recesses and after school and I really made use of what I have learnt, like chunking the words into different parts to help them decode the word easier.

To be frank, I think some of my students are dyslexic according to the symptoms but the school says they do not have, so sometimes I was quite confused whether I should use the specific teaching strategies to help those suspect students. Sometimes I did but usually after school or lunch time. As for lesson time, I tried my best to design different learning materials to cater for students with different learning needs. I think schools should develop a more comprehensive resource package in order to provide students with the greatest benefit.

From the responses, they reveal that there were not as many opportunities as expected to apply what pre-service teachers have learnt throughout the five years and several reasons were pointed out. First, there were too many different kinds of SEN students in one class during the teaching practicum where pre-service teachers could not control in a very smooth way. Instead, they were asked to manage the class and students' discipline by their supporting teachers when there were chaos in a classroom. Second, there were many hidden cases in a school where pre-service teachers were not very sure and not confident enough to point out if one student belonged to which kind of SEN. These realities actually made pre-service teachers depressed because they were not fully given the right to decide everything for the class and to provide helping hands to SEN students.

However, since pre-service teachers had suspect on some students' capabilities during the teaching practicum, they contributed their spare time in recesses and after school to provide extra support to students in need and they did find some strategies beneficial to weak and dyslexic students. For example, they tried to chunk an English word into different parts according to the number of syllables to help students to spell and

pronounce the word more accurately. With regular practices, students could remember the words taught and their capabilities in word recognition became slightly better.

In short, pre-service teachers at EdUHK were not given ample opportunities to apply what they have learnt, even during the teaching practicum. It is pointed out by one of the interviewees that schools should develop a more comprehensive resource package for teachers to provide extra support to SEN students outside class.

5.4.3 Suggestions

The questions asked in the interview in this part were:

1. To what extent do you agree that the training(s) provided by The Education University of Hong Kong (EdUHK) is / are effective in equipping you with certain skills and knowledge to deal with dyslexic students?
2. Do you think the training(s) provided by The Education University of Hong Kong (EdUHK) is / are enough to prepare you to carry out inclusive practices for dyslexic students?

The responses were:

Definitely not enough! I think in terms of theories, okay but then we really need to apply or evaluate if the taught strategies are applicable in the students. If not, there is no point to learn such much knowledge and many skills about dealing with dyslexic students. Therefore, I think a teaching practicum to special schools can be arranged even if it is a short one, like two to three weeks. It is necessary to make it compulsory as this is the trend in the education field. We, as teachers, cannot avoid dealing with SEN students.

Not enough for sure. I do think there is a need to have a lot more courses on dealing with dyslexic students. As dyslexia is highly-related to language, the department should develop some specific courses for us as English majors to

acquire more teaching skills to provide the greatest benefit to dyslexic students apart from only using colors to differentiate the vowels and consonants. I also think a practicum to special schools is a must and EdUHK can make reference to Finland's implementation, a short practicum after some theories for a few cycles.

According to the responses made by the participants, they thought that there are still not enough opportunities for pre-service teachers at EdUHK for both theory-learning and practice and they made some suggestions for improvement in the future.

In terms of theory learning, some specific courses on dealing with and teaching dyslexic students should be organized especially for English pre-service teachers because dyslexia is a special educational need which is highly-related to language. If English teachers do not know how to teach, then no one will be able to provide the greatest benefit to dyslexic students.

In terms of practice, one more compulsory teaching practicum to special schools should be implemented because more and more SEN students are going to study in mainstream schools whom teachers cannot avoid teaching. As for the design of the teaching practicum, it is suggested making reference to the implementation of teaching practicum in Finland. Students do a short-term placement after acquiring some theories and this will be done for a few times, so the mode would be 'Theory-Practice-Theory-Practice'.

In short, EdUHK should consider evaluating the current curriculum for all Education majors and making changes in order to respond to the current trend in the education field. More hands-on experience and exposure to SEN students should also be provided to enrich students' learning experiences and thus becoming a more competent teacher.

6. Limitations

There are several limitations identified in this research study and they will be explained in the following.

First, the research study cannot be fully representative of all pre-service teachers in Hong Kong. The sample size is quite small which only involved English pre-service teachers in one university in Hong Kong as participants, and there is a large gap between the number of male and female pre-service teachers, causing the research study not to be able to provide a comprehensive view of pre-service teachers in Hong Kong.

Second, the data obtained in both the questionnaire and interview were not convincing enough. Although the questionnaire design was adapted from previous research studies, there were insufficient items to test participants' knowledge, making it not statistically significant. Besides, only some correlations between pre-service teachers' knowledge and attitude were identified because the data concerning pre-service teachers' training were not quantitative.

Third, shallow evaluations of the training received were made. As pointed out by the interviewees, there were not enough opportunities for pre-service teachers at EdUHK to fully apply and evaluate what they have learnt, and therefore little evaluation on the effectiveness of the training was made.

7. Ethical concerns

Participants were provided with an information sheet about the background information of the research topic, the names of the supervisor and supervisee. They were required to sign the

consent form for agreeing to participate in this research and could quit at any time if they felt uncomfortable. Their responses and information were kept confidential.

Besides, there were interview questions related to application for teaching strategies during the teaching practicum and other teaching placements and the interviewees leaked out the schools' names and even some personal information of SEN students. In order to protect the schools and SEN students from being disclosed, there was no use of names when doing the analysis.

8. Conclusion

In conclusion, a research study was carried out to investigate Hong Kong pre-service teachers' knowledge, attitude and training towards students with dyslexia, to discuss the relationship between pre-service teachers' knowledge and attitude and to make recommendations to improve the current practices. There are some implications to be made with regard to each item.

In terms of knowledge, pre-service teachers were still found to have much more misunderstandings and misconceptions than pieces of knowledge. Although it is pointed out that the compulsory course SED3001 at EdUHK is theory-based and covers a lot on the symptoms and characteristics of dyslexic students, pre-service teachers seemed still not to be able to master all of them. If they do not acquire certain knowledge, they cannot provide dyslexic students with the greatest benefit in the future. Therefore, a heavier emphasis on the knowledge of dyslexia should be put in the teaching training programs.

Regarding attitude, pre-service teachers were identified to be positive towards the existence of dyslexia as well as the connotations of the use of the term 'dyslexia'. When it comes to real-life settings and scenarios, they seemed to be less confident and positive in dealing with dyslexic

students as a teacher-to-be. Though this is still a long way to go to build up their confidence in handling dyslexic students, teaching training programs in Hong Kong should try to provide more support in order to maximise pre-service teachers' exposure to dyslexic students.

With regard to training, pre-service teachers were not given ample opportunities to get hands-on experience related to dyslexic or SEN students. Universities in Hong Kong which offer Education programs should consider evaluating the curriculum and adding more either compulsory or voluntary elements relevant to SEN students into the curriculum to satisfy the society's needs.

Last but not least, the results in this study can be used to design future research in multiple ways. First, the results together with those previously published can be helpful to strengthen the argument that pre-service teachers are responsible for having accurate descriptions about dyslexia to provide optimal help to students with dyslexia. Besides, the study design can be modified for universities to use as an instrument for teaching training programs to evaluate pre-service teachers' readiness to teach students with dyslexia in terms of knowledge and attitude and to critically reflect on the curriculum design in terms of training provided.

9. References

- Ade-Ojo, G. O. (2011). Practitioners' perception of the impact of the vision of policy-makers on practice: the example of the recommendations of the Moser Commission. *Research Papers in Education, 26*(1), 53-77.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behaviour. In J. Kuhl, & J. Beckmann (Eds.), *Action-control: From cognition to behaviour* (pp. 11-39). Heidelberg: Springer.
- Allington, R. L. (1982). The persistence of teacher beliefs in facets of the visual perceptual deficit hypothesis. *The Elementary School Journal, 82*, 351–359.
- Beacham, N., & Rouse, M. (2012). Student teachers' attitude and beliefs about inclusion and inclusive practice. *Journal of Research in Special Educational Needs, 12*(1), 3-11.
- Becroft, A. (2004). *Youth justice in New Zealand: Future challenges*. Paper presented at the New Zealand Youth Justice Conference "Never Too Early, Never Too Late", Wellington, New Zealand.
- Casarez, L., Stevens, T., Siwatu, K. O., & Cain, D. (2013). *Preservice teachers' attitudes toward students with disabilities: A study of candidates enrolled in teacher preparation programs*. Paper presented at the annual Consortium of State Organization for Texas Teacher Education Conference, San Antonio, TX.

Chan, D. W., Ho, C. S. H., Tsang, S. M., Lee, S. H., & Chung, K. K. H. (2007). Prevalence, gender ration and gender differences in reading-related cognitive abilities among Chinese children with dyslexia in Hong Kong. *Educational Studies*, 33, 249-265.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education (6th ed.)*. New York: Routledge.

Department of Health. (2017). *Dyslexia*. Hong Kong: Department of Health. Retrieved from https://www.dhcas.gov.hk/file/conditions/Dyslexia_Eng_1801.pdf

Education Bureau (EDB). (2010). *Operation guide on the Whole School Approach to Integrated Education*. Hong Kong: Education Bureau. Retrieved from http://www.edb.gov.hk/attachment/en/edusystem/special/support/wsa/ie%20guide_en.pdf

Education Bureau (EDB). (2014). *Parent guide on the Whole School Approach to Integrated Education*. Hong Kong: Education Bureau. Retrieved from <http://www.edb.gov.hk/attachment/en/edu-system/special/support/wsa/ieparentguide.pdf>

Education Bureau (EDB). (2015a). *How to support children with specific learning difficulties in reading and writing*. Hong Kong: Education Bureau. Retrieved from http://www.edb.gov.hk/attachment/en/edusystem/special/resources/serc/download/spld_e.pdf

Education Bureau (EDB). (2015b). *Teacher professional development on catering for students with special educational needs*. Hong Kong: Education Bureau. Retrieved from <https://applications.edb.gov.hk/circular/upload/EDBC/EDBC15012E.pdf>

Elias, R. (2014). *Dyslexic learners: an investigation into the attitudes and knowledge of secondary school teachers in New Zealand*. (Doctoral Dissertation, The University of Auckland, New Zealand). Retrieved from http://www.dyslexiafoundation.org.nz/dyslexia_advocacy/pdfs/re_dissertation_2014.pdf

Gonzalez, K., & Frumkin, R. (2016). *Handbook of Research on Effective Communication in Culturally Diverse Classrooms*. Hershey: USA. IGI Global Publishing.

Good, T. L., & Brophy, J. E. (1997). *Looking in classrooms (7th ed.)*. New York, NY: Longman.

Griffiths, C. B., Norwich, B., & Burden, R. L. (2004). Parental agency, identity and knowledge mothers of children with dyslexia. *Oxford Review of Education*, 30(3), 417–434.

Gwernan-Jones, R., & Burden, R. L. (2010). Are they just lazy? Student teachers' attitudes about dyslexia. *Dyslexia*, 16(1), 66-86.

Hornstra, L., Denessen, E., Bakker, J., Bergh, L., & Voeten, M. (2010). Teacher attitudes toward dyslexia: effects on teacher expectations and the academic achievement of students with dyslexia. *Journal of learning disabilities*, 43(6), 515-529.

- Kamala, R. (2014). Multisensory approach to reading skills of dyslexic students. *IOSR Journal Of Humanities And Social Science*, 19(5), 32-34.
- Kerr, H. (2001). Learned helplessness and dyslexia: A carts and horses issue? *Reading, Literacy and Language*, 35(2), 82-85.
- Lam, C. (2004). Services for developmental dyslexia in Hong Kong. *BrainChild*, 3, 18-23.
- Legislative Council (LegCo). (2014). *Panel on education subcommittee on Integrated Education*. Hong Kong: Legislative Council. Retrieved from https://www.legco.gov.hk/yr13-14/english/panels/ed/ed_ie/reports/ed_iecb4-1087-1-e.pdf
- Lyon, G. R. (1995). Toward a definition of dyslexia. *Annals of dyslexia*, 45(3), 3-27.
- Lyon, G. R., Shaywitz, S. E., & Shaywitz, B. A. (2003). Defining dyslexia, comorbidity, teachers' knowledge of language and reading: A definition of dyslexia. *Annals of Dyslexia*, 53, 1-14.
- Macdonald, S. J. (2009). Windows of reflection: Conceptualising dyslexia using the social model of disability. *Dyslexia*, 15(4), 347-362.
- Peterson, R.L., & Pennington, B.F. (2015). Developmental dyslexia. *Annual Review of Clinical Psychology*, 11, 283-307.

Petscher, Y., Fien, H., Stanley, C., Gearin, B., Gaab, N., Fletcher, J. M., & Johnson, E. (2019).

Screening for Dyslexia. United States: National Centre on Improving Literacy. Retrieved from

<https://improvingliteracy.org/sites/improvingliteracy1.uoregon.edu/files/whitepaper/ScreeningforDyslexia.pdf>

Savage, R. (2004). Motor skills, automaticity and developmental dyslexia: A review of the research literature. *Reading and Writing: An Interdisciplinary Journal*, 17(3), 301-324.

Schumacher, J., Hoffmann, P., Schmäi, C., Schulte-Körne, G., & Nöthen, M. M. (2007). Genetics of dyslexia: the evolving landscape. *Journal of medical genetics*, 44(5), 289-297.

Shaywitz, S. (2003). *Overcoming dyslexia: A new and complete sciencebased program for reading problems at any level*. New York: Alfred A. Knopf.

The International Dyslexia Association (IDA). (2014). *IDA dyslexia handbook: what every family should know*. Baltimore: The International Dyslexia Association. Retrieved from <http://www.readingrockets.org/sites/default/files/IDA%20Dyslexia%20Handbook.pdf>

Undheim, A. M. (2003). Dyslexia and psychosocial factors: A follow-up study of young Norwegian adults with as history of dyslexia in childhood. *Nordic Journal of Psychiatry*, 57, 221-226.

Wadlington, E. M., & Wadlington, P. L. (2005). What educators really believe about dyslexia. *Reading Improvement*, 42, 16–33.

Washburn, E. K., Binks-Cantrell, E. S., & Joshi, R. M. (2014). What do preservice teachers from the USA and the UK know about dyslexia? *Dyslexia*, 20, 1-18.

Wolf, M. & Bowers, P. (1999). The double deficit hypothesis for the developmental dyslexias. *Journal of Educational Psychology*, 91, 1-24.

Wong-Ratcliff, M., & Ho, K. K. (2011). Can Integrated Education meet the needs of students with SEN? *New Horizons in Education*, 59(2), 101-115.

Appendix 1: A sample questionnaire

THE EDUCATION UNIVERSITY OF HONG KONG

Department of Special Education and Counselling

QUESTIONNAIRE

**An exploration on Hong Kong pre-service teachers' knowledge, attitude and training
towards students with dyslexia**

Personal Information

1. Gender: Male / Female
2. Year of study: Year 5 in 2018-2019

Part 1: Knowledge about dyslexia (adapted from Elias, 2014; Gwernan-Jones & Burden, 2010)

Please circle the correct answer for Questions 1 and 2 below.

1. 'Dyslexia' primarily refers to:
 - a. a difficulty with letter and / or number reversals.
 - b. a difficulty with written language.
 - c. a difficulty learning the sequences of letters, syllables or numbers.
 - d. both a. and c.

2. Dyslexia is characterised by difficulty at:
 - a. text level.
 - b. sentence level.
 - c. word level.

d. all of the above.

Please decide if the following statements are True (T) or False (F).

3. Dyslexia is not heritable. True / False
4. Difficulties with fluency and automaticity are common in dyslexia. True / False
5. A person who is dyslexic is more likely to also have ADHD, dyspraxia and / or specific language impairment than a non-dyslexic person. True / False
6. A dyslexic person is likely to have an excellent auditory working memory. True / False
7. There is a general consensus that difficulty with phonological coding is the core deficit in dyslexia. True / False
8. Multi-sensory teaching methods are considered to be particularly helpful to dyslexic pupils. True / False

Part 2: Attitude towards dyslexia (adapted from Elias, 2014; Gwernan-Jones & Burden, 2010)

Please put a tick (✓) on the line that best represents your attitudes about the statements below. To record your attitudes about dyslexia, you can respond in the following 5 ways: SA = Strongly Agree; A = Agree; N = Neutral; D = Disagree; SD = Strongly Disagree.

	SA	A	N	D	SD
1. I think dyslexia is a myth.					
2. The word 'dyslexia' is really just an excuse for laziness.					

3. Dyslexic students often do not succeed as adults.					
4. Usually dyslexic students have low ability.					
5. Calling a student 'dyslexic' makes it sound as if he / she has a problem that cannot be cured.					
6. The label 'dyslexia' can help a student know he / she is not lazy or stupid.					
7. The label 'dyslexia' can help a teacher understand how to support the student.					
8. The label 'dyslexia' can be an excuse for a student to stop trying.					
9. Parents often want to call a child 'dyslexic' when he / she is just actually immature.					
10. Parents want to call their child 'dyslexic' when actually he / she has low ability.					
11. I feel confident I could support a dyslexic student's learning.					
12. I feel more training should be given to teachers about dyslexia.					

Part 3: Training towards dyslexia

Please write down your thoughts below.

1. What training(s) do you receive from The Education University of Hong Kong about dealing with students with dyslexia? List it / them out.

References

- Elias, R. (2014). *Dyslexic learners: an investigation into the attitudes and knowledge of secondary school teachers in New Zealand*. (Doctoral Dissertation, The University of Auckland, New Zealand). Retrieved from http://www.dyslexiafoundation.org.nz/dyslexia_advocacy/pdfs/re_dissertation_2014.pdf
- Gwernan-Jones, R., & Burden, R. L. (2010). Are they just lazy? Student teachers' attitudes about dyslexia. *Dyslexia*, *16*(1), 66-86.

Appendix 2: Interview questions

THE EDUCATION UNIVERSITY OF HONG KONG

Department of Special Education and Counselling

INTERVIEW QUESTIONS

An exploration on Hong Kong pre-service teachers' knowledge, attitude and training towards students with dyslexia

The following questions are just a guide for the interviewer. Follow-up questions may be asked in accordance with the interviewee's responses.

1. What training(s) do you receive from The Education University of Hong Kong (EdUHK) about dealing with students with dyslexia?
2. What have you learnt from the training(s), for instance, definition of dyslexia, definition of special learning difficulties, specific characteristics about dyslexic students, teaching strategies, etc?
3. How much can you apply what you have learnt during the teaching practicum?
4. To what extent do you agree that the training(s) provided by The Education University of Hong Kong (EdUHK) is / are effective in equipping you with certain skills and knowledge to deal with dyslexic students?

5. Do you think the training(s) provided by The Education University of Hong Kong (EdUHK) is / are enough to prepare you to carry out inclusive practices for dyslexic students?