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The Impact of Teacher Training Materials Used in Primary Schools on Efficient Learning of Dyslexic Students

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Abstract

Due to the inability of dyslexic students in grasping the recognition of words and developing the language skills of spelling, writing and decoding; despite having high intelligent quotients and higher cognitive abilities, it is very paramount to assist dyslexic children to learn reading skills right from primary school education because if left too late or untreated, the dyslexic child is prone to develop low self-esteem and poor confidence. The major dilemmas faced by the teachers of people with special needs such as dyslexia are the dilemma of identification, curriculum and location. This research seeks to evaluate the impact of teacher training materials used to train teachers at Lagos state Colleges of Education in Nigeria (an institution that mainly trains primary school teachers) on the efficient learning of students with dyslexia based on the UDL principles of providing multiple means of representation, action & expression and engagement. Using the mixed method approach, quantitative data was collected from close-ended questionnaires administered to students and teachers of Colleges of Education in Lagos State, Nigeria, while qualitative data was collected from open-ended questions of the questionnaire and semi-structured interviews. 77 quantitative responses were collected and analyzed using statistical analysis while the qualitative responses were analyzed using content analysis.

Keyword: Dyslexia, Universal Design for Learning (UDL), Learning Disability (LD), Specific Identification

Introduction

Dyslexia is a specific learning disability (SpDL) that causes difficulties in reading, writing and speaking despite normal intelligence and functions (Amesbury, 2007). It is neurobiological in origin and its characteristics are often poor recognition of words and the inability to spell and decode. SpLD consists of several types of specific deficits namely dyslexia, dyspraxia or developmental coordination disorder, hyperactivity or attention deficit disorder (ADD, ADHD) and high functioning autistic spectrum disorders. Other manifestations include poor short-term memory, clumsiness, difficulty with spatil awareness, poor numbering skills and poor visual sequencing (Amesbury, 2007). According to Henderson and Warmington (2017), dyslexia has been strongly shown to be the result of a neurocognitive deficit in processing which negatively impact the student's capacity to collect, isolate and manipulate speech in audio form and the association of both oral and written words (Hulme et al., 2015; Ramus & Szenkovits, 2016; Vellutino et al., 2004; Snowling et al., 2016). In addition, the occurrence of high short-term memory load and the inclination to access but not store phonological representation are associated with this disability (Ramus & Szenkonvits, 2008; Boets et al., 2013). Dyslexia is not manifested only in phonology, but also in a large number of non-phonological deficits such as procedural learning, working memory and short-term memory (Henderson & Warmington, 2017). Both children (Hedenius et al., 2013; Jimenez-Fernandez et al., 2011; Vicaro et al., 2003) and adults (Menghini et al., 2006; Stoodley,

Harrison, & Stein, 2006) with dyslexia have been found to exhibit significantly reduced sequence learning based on an experiment using a serial reaction time (SRT) paradigm to measure sequential learning. Lum, Ullman, and Conti-Ramsden (2013) further revealed in a meta-analysis that people with dyslexia have deficits in procedural learning. However, inconsistencies occur in the population of dyslexic individuals, with some deficits reported only during higher-order sequence tasks (Howard, Japiks, & Eden, 2006) or more implicit tasks (Jimenez-Fernandez et al., 2011; Vicaro et al., 2003). Developmental dyslexia and specific language impairment (SLI) are observed in about 7-10% of students (Snowling, 2015). Irrespective of the students' ability to function intelligibly with normal hearing and in a proper environment, the students with SLI find it hard to assimilate syntax, phonology, lexicon and morphology (Leonard, 1998). Dyslexic students have difficulty in performing phoneme manipulation (Catts et al., 2005), poor digit span and non-word repetition which indicates poor verbal short-term memory (Sowling 2015), and poor rapid naming tasks (Wolf, 1999). Stein (2001) and others believe that phonological deficits are vitally responsible for reading impairments, and Tallal (2003) acknowledges that phonological deficits are a connection between disrupted auditory processing and wider language impairments.

Due to the inability of dyslexic students in grasping the recognition of words and developing the language skills of spelling, writing and decoding; despite having high intelligent quotients and higher cognitive abilities, it is very paramount to assist dyslexic children to learn reading skills right from primary school education because if left too late or untreated, the dyslexic child is prone to develop low self-esteem and poor confidence. Furthermore, ineffective intervention could lead to the development of emotional problems as a result of inferiority and frustration. Strong evidence has shown that language difficulties continuously progresses into adolescence and adulthood in children with dyslexia if left unattended to. According to Mefor and Chika (2018), dyslexia is more of a learning difference than a medical problem, as the student is found to utilize the right side of their brains for language processing, as opposed to the normal use of the left side. This indicates that the dyslexic student uses alternative mental tools from the conventional ones to decode and learn. He went further to recommend that alternative teaching techniques, which includes multisensory methods, use of visual, audio and audio-visual methods and the involvement of physical exercises must in turn be implemented to effectively train these students. Magnan et al. (2004) conducted a research to investigate the effectiveness of audio-visual measures in the teaching of dyslexic students. By incorporating daily voice exercises and trainings 30 minutes/day, 4 days/week and across 5 weeks, their assessment revealed that the sample group benefitted greatly from these alternative multisensory training techniques. Therefore, early intervention programs manage phonological deficits and the education of teachers and trainers to increase public awareness is highly recommended. These programs should incorporate multisensory techniques and completely utilize the visual, auditory and kinaesthetic sensory components of children with dyslexia to enhance their memory and learning (Thompson, 2010; Osman, Yahaya & Ahmed, 2015).

The Universal Design for Learning (UDL) is a comprehensive framework designed to tackle the issue of curriculum and the limitations of learning environment rather than learner limitations. UDL researchers (Rose & Meyer, 2002; Rose et al., 2006) suggest that the design of accessible contents which are delivered in accessible learning environments can enhance learning experience irrespective of individual learning abilities. It focuses on the techniques of curricula design to reduce the implications of learner differences and it is significant in different learning settings. Empirical researches such as Burgstahler (2011) and Rao, Ok and Bryant (2014) have revealed promising outcomes in terms of academic performance and learner perception in the adoption of UDL principles in curricula design. However, Manglatordi and Serenelli (2013) have noted that despite these promising results, the UDL is mainly adopted in

the USA and not yet common in other parts of the world. The ultimate aim of the UDL is to reduce learning barriers by moving from a teacher-centered approach to a learner-centered approach through the provision of a multiple means of content representation, knowledge expression and learner engagement. In addition, the UDL is designed to tackle the issues of accessibility, facilitate learner inclusion and bring students together without a need to segregate them based on their different abilities. Thus, it can be said that the Universal Design for Learning Framework seeks to address learning limitations from a wider scope (Al-Azawel, Serenelli & Lundvist, 2016). According to Rao and Meo (2016), the UDL framework is utilized to design flexible learning environments that proactively integrates supports that caters for learner variability. Rao and Meo (2016) support Al-Azawel, Serenelli and Lundvist (2016) claims that instructions are usually more accessible to a wider range of learners when the lessons are deliberately designed to align with the UDL guidelines of providing multiple means of representation, action & expression and learners' engagement. During the lesson planning phase, the UDL guideline can help teachers build flexible pathways that integrates students' special needs, preferences, backgrounds, experiences and abilities whilst ensuring that lessons are comprehensible and engaging. Also, the UDL framework helps teachers to identify areas where the curriculum is inflexible and not associate learning problems with the student. It does not see learner variability as a difficult problem but encourages teachers to examine if the curriculum is designed to optimize students' learning (Hartmann, 2015). Currently, there is a dearth of research on the evaluation of teacher training materials for primary education using the UDL framework in Nigeria. Hence, learning outcomes cannot be accurately measured. My relation to this study cannot be farfetched, having being dyslexic and struggled through school with little or no support, my zeal to help improve the teaching process in my country, Nigeria of the dyslexic child by creating awareness is my underpinning drive. There is a need for teachers to be able to identify and provide quick Intervention Response at their prime. Teachers at this level require information and set skills to be able to improve the learning challenges the dyslexic children may encounter. Having established the existence of diversity and variability of learners in classrooms, the need to create learning instructions that aligns with standard framework to cater for dyslexic students and the dearth of existing research on the investigation of the impact of teacher training materials used in primary school education on the efficient learning of students with dyslexia in Nigeria, this research seeks to evaluate the teacher training materials used to train teachers at Lagos state Colleges of Education in Nigeria (An institution that mainly train primary school teachers) an investigate its impact on the efficient learning of students with dyslexia based on the UDL principles of providing multiple means of representation, expression and engagement.

This aim of this research is to evaluate teacher training materials used in primary education within Lagos state, Nigeria and investigate how far it supports the efficient learning of pupils with dyslexia. Based on the Universal Design for Learning (UDL) Guidelines (CAST, 2018), this research seeks to answer but are not limited to the following questions:

(i) To what extent does primary school teacher training materials provide multiple means of engagement for pupils with dyslexia in Lagos state, Nigeria?,
(ii) To what extent does primary school teacher training materials provide multiple means of representation for pupils with dyslexia in Lagos state, Nigeria?,
(iii) To what extent does primary school teacher training materials provide multiple means of action and expression for pupils with dyslexia in Lagos state, Nigeria?,
(iv) To what extent are the teachers of primary schools in Lagos state, Nigeria aware about recent intervention strategies to support children with dyslexia and how well is this reflected in teacher training materials?, and
(v) Are there training activities in place to equip teachers with the skills and knowledge required to support the learning of children with dyslexia?

The level of awareness of dyslexia in the Nigerian society and the government has played a large impact in the education of dyslexic children within the country. There exists such a significant lack and misinformation in the understanding of disability rights and disability, that it has been shown that it negatively impacts the practices and perceived understanding of those considered teachable or unteachable (Ahmed & Ogoshi, 2015). Oliver (1992) revealed that disability does not exist outside the societal construct as it was formed by the society itself and determined by the meanings assigned to it. The Nigerian legislation on disability has been found to greatly rely on existing societal and cultural constructs limiting its effects to these social boundaries (Ahmed & Ogoshi, 2015). The low level of dyslexia awareness in Nigeria has resulted in the society unable to recognize that dyslexia is an actual learning disability, resulting in the lack of important government policies, specially constructed teaching programs and almost complete abandonment of dyslexic pupils. This has resulted inevitably in the denial of dyslexic children of formal education while being considered uneducable (Ahmed & Ogoshi 2015). Mefor and Chika (2018) conducted a research and revealed that the Nigerian population as a whole consist of about 20 percent dyslexic individuals, about 36 million people, most of whom know little to nothing about this learning difficulty. However, dyslexic awareness in Nigeria is not completely unknown, in fact certain measures have been placed by private individuals to attend to this difficulty. Examples include the privately funded Dyslexia Nigeria, a company with the vision to enable dyslexic people to reach their highest potentials. Through structured sessions of teacher training, bespoke courses and on-site and workshop training in schools and organizations, they aim to create a conducive environment for the education of dyslexic students. They unite parents, careers and government agencies alike. Lagos state is one of the states in the southwestern geopolitical zone of Nigeria, arguably the most economically important state of the nation, Nigeria. It is the Nation's largest urban area and the hub of financial activities in Nigeria. It is also regarded as the fifth largest economy in Africa. As at 2006 census, it has a total population of 17.5 million and has grown to a population of 21 million in 2016. It is the most populous city in the state and in Nigeria as a whole. Its total generated revenue in 2017 was equivalent to 920 million US dollars growing by 10.43 percent when compared to the previous year. Lagos state has numerous government and private primary and secondary schools with over 19 tertiary institution in total (Lagos state news, 2019). It is believed that using Lagos state as a case study in this research is a good representation of Nigeria as a whole.

The pragmatic research philosophy is employed in this research as it will make use of the mixed methods research approach and the case study research strategy to achieve its objectives through the administration of questionnaires and semi-structured interviews to teachers being trained at Colleges of Education in Lagos State, Nigeria and teachers in Lagos state primary schools. Section II discusses the UDL framework and its application in the design of teacher training materials, examines the models, theories and concepts of learning variability and diversity existing in children with dyslexia and analyses the theoretical framework for examining the impact of teacher training materials on efficient learning. Section III discusses the research methodology adopted by justifying the philosophy, approach and strategy of the research. It describes the data analysis and collection techniques used for the research. Section IV presents the results collected from the questionnaires and semi-structured interviews together with answering the research question, and Section V presents the conclusion, limitations and future areas of research derived from the study.

Theoretical Framework

The Universal design for disabled people includes seven basic principles namely: equitable use where people's diversity and ability should be considered in the design process, flexible use where individual preferences and abilities are catered for, simple and intuitive use

where instruction is designed to be easily understood regardless of prior experience and knowledge, perceptible information where instruction is designed to communicate information effectively to all users despite their ambient conditions or sensory abilities, tolerance for error where the instruction is designed to minimize risks and errors emanating from unintended actions, minimal physical effort were instructions are designed to minimize required physical effort and size and space for approach and learning where instructions are designed to provide suitable size and space for learners irrespective of their body size, mobility and/or posture (Al-Azawei, Serenelli, & Lundqvist, 2016). UDL as defined by The Centre for Applied Special Technology (CAST) is a framework that addresses the hindrances to efficient learning within learning environments using an inflexible and a general curriculum (CAST, 2018). Center of Universal Design (2015) argued that barriers to learning are not determined by leaner's capacities but in learner's interactions with educational goals, materials, methods and assessments that are inflexible and a one-size-fits-all curriculum. The UDL framework is divided into three networks which are defined as:

• Recognition Networks which represents what is being learnt as learners categorize what they learn as what they see, hear and read

• Strategic Network which represents how learning occurs as learners organize their thoughts and express their ideas in different ways

• Affective Network which represents why learning occurs as learners can be engaged in different ways to keep them excited and interested about learning (Al-Azawei, Serenelli, & Lundqvist, 2016).

Rose and Meyer (2002) theorized three sets of principles to apply the three learning frameworks. These principles include nine guidelines and 31 checkpoints as seen in the figures below. The principles are:

• To provide multiple means of representation: this suggests the presentation of learning contents in different medium such as video, audio, text, graphs, and other multimedia. Thereby, providing better learning opportunities not only for learners with disabilities but for everyone as well. According to King-Sears (2015) the multiple means of representation principle refers to the different means of providing options for perception, expression, language, symbols and comprehension. An example is highlighting patterns.

• To provide multiple means of action and expression: this suggests asking students to express their acquired knowledge in other formats such as short quizzes, scientific papers, assignments, interviews and multimedia presentations to assess their knowledge more effectively rather than the conventional style of exclusively using exams to measure their understanding and knowledge. Also, in most cases, learners do not prefer exams due to its restricted time and organizational setting. According to King-Sears (2015), this principle means the multiple means of providing students with options to communicate and express themselves, for physical action and executive function. This is achieved when learning supports are gradually being removed as learners acquire fluency.

• To provide multiple means of engagement: this suggests using strategies that can sustain learner's motivation to maintain high levels of interest during active lecture rather than the convectional lecture format which may negatively influence learners' engagement. An example of an improved strategy is the method of delivering lecture contents through question and answer sessions, peer-tutoring, open discussions and an applied practical real-life problem-solving approach (Al-Azawei, Serenelli, & Lundqvist, 2016). According to King-Sears et al. (2015), this principle refers to the multiple options of recruiting learner's interests, sustaining effort and persistence, and self-regulation. An example is the steps taken to minimize distractions.

Current Research on Universal Design for Learning (UDL)

A recent review of UDL was conducted using 13 studies that featured UDL interventions. The review explained that two out of the 13 studies designed lesson plans after UDL instructions while others focused on students' satisfaction after UDL implementation. Rao and Bryant (2014) case study research incorporated UDL into a high school science education class that included students with different learning disabilities. The educators however, noted changes when UDL was implemented such as: a sense of ownership of all students and more active teaching versus developing modifications. From the teachers' perspectives, students showed more interest in the UDL-enhanced techniques that included graphic designs, step-by-step directions, and practical demonstrations of lab activities and visual modelling of completed project stages. Although, this review showed the impact of UDL in the studies, it does not give a report on specific student learning outcomes.

Rao and Bryant (2014) recommended that for UDL to be successfully implemented and generalizability to be determined for students, more details about students is needed including disability category and achievement information. This will help researchers to provide accurate evidence of the impact of UDL on students with learning difficulties. Rappolt-Schichmann et al. (2013) carried out a study to evaluate the impact of UDL implementation in elementary science classes and observed that students who used UDL customized notebooks with text-to-speech features, illustrations, and multi-media response options performed better in post-tests than their peers who used the traditional note making. The researchers noted that students at different levels of reading and writing and with varying motivation for sciences equally benefitted from the intervention. Marino (2009) reported that learning outcomes for students with reading difficulties are disaggregated when compared with their colleagues without reading problems after lesson plans were designed using UDL interventions of video games and print-based texts. Contrary to expectations, students with learning disabilities performed at the same level regardless before and after UDL was applied. Although, differential impacts on the students was not properly examined, it was recommended that researchers should provide empirical support to fully understand the impact of UDL on learning outcomes of students with learning disabilities.

Research Methodology

The pragmatic research philosophy is quite different from interpretivism and positivism because it has a world view that emanates from actions, situations and consequences. Rather than focus on research methods, pragmatists emphasize the research problems and adopt all available approaches to understand the problem. It is usually used in mixed methods research as it conveys its importance in employing varying methods to understand a research problem. Hence, it draws from the assumptions, worldviews and beliefs of the positivists and interpretivists (Creswell & Plano, 2007). Pragmatists recognize that the world can be interpreted in different ways and that a single point of view can never give the entire picture. Therefore, they use methods that enhances credible, reliable and relevant data to be collected about a phenomenon (Saunders, Lewis & Thornhill, 2012). This research will adopt the pragmatism research philosophy to enable it employ research methods that will provide credible data to investigate and evaluate the impact of teacher training materials used in Nigerian Primary schools and its resulting impact on efficient learning of students with dyslexia.

Adductive reasoning decides the most likely inference from a set of observations. It is important because often times, there is multiple number of possible explanations for a phenomenon, so there is a need to decide the most appropriate explanation to first look at. Adductive reasoning starts with the most likely explanation and tests if it is true. If it is not true, it moves on to the next most likely explanation (Epigeum Ltd, 2009). According to

(Saunders, Lewis & Thornhill, 2012). Adductive approach is used to address the weaknesses of the deductive and inductive approaches via the adoption of a pragmatist philosophy. The adductive reasoning research approach aligns more with the research aim of this study to evaluate teacher training materials used in primary education within Lagos state, Nigeria and investigate how far it supports the efficient learning of pupils with dyslexia. It also aligns with the pragmatism research philosophy. Hence, the adductive research approach will be employed for this research study.

The mixed methods research is an approach that combines both the qualitative and quantitative forms of research. It combines their philosophical assumptions and reasoning approaches. It not only collects and analyses qualitative and quantitative data, it utilizes both approaches so that the overall strength of the study is greater than when qualitative or quantitative research is used alone (Creswell & Plano, 2007). It provides a preference for viewing research problems from a variety of perspectives thereby, increasing the accuracy of research findings and providing a fuller understanding of the study under investigation (Denscombe & Martyn, 2014). This study will adopt the mixed methods research to collect qualitative and quantitative data to strengthen the study of investigating teacher training materials used in Nigerian primary schools and to evaluate their impact on the efficient learning of pupils with dyslexia. This study aims to evaluate teacher training materials used in primary education within Lagos state, Nigeria and investigate how far it supports the efficient learning of pupils with dyslexia. Thus, the case study research strategy will be adopted in this research study to collect both qualitative and quantitative data.

In semi-structured interviews, the researcher/interviewer will have a list of research themes and key questions to be asked which may vary from interview to interview. The order of questions varies depending on the flow of conversation and additional questions may be asked to further explore the research questions and objectives given the nature of events within the case study. This nature of interview necessitates either audio-recording or note taking to accurately capture data. The semi-structured interview is likely to follow a schedule where comments will be used to open the discussion, prompts to promote and further discussion and some comments to close the discussion (Saunders, Lewis & Thornhill, 2012). The semi-structured interview is suitable when an exploratory study is to be conducted as it is required to infer causal relationships between variables. It also helps to understand the reasons why research participants take certain decisions. It is useful in probing answers where more explanations are needed and to build on such responses. Responses from semi-structured interviews can lead discussion into areas that have not been previously considered but are significant to answering the research question. Some managers in organizations do not find time to sit down and answer questionnaires. Hence, they may find a semi-structured interview to be interesting if it is relevant to their current work. In addition, the semi-structured interviews are useful when there are a large number of questions to be answered and the questions are either complex or open-ended (Saunders, Lewis & Thornhill, 2012). Based on the benefits and suitability of semi-structured interviews to this research, the researcher will employ the use of semi-structured interviews to collect qualitative data from heads of special education department of primary schools, course advisers and lecturers of colleges of education in Lagos State via the telephone for distance and cost reasons as it is more convenient and feasible. Questionnaires are standardized questions that can be interpreted the same way by all respondents. Hence, they are useful in descriptive or explanatory research. Saunders, Lewis and Thornhill (2012) highlighted some of the factors that influence the choice of a questionnaire in a research study. They are the characteristics of the respondents from which data is to be collected, importance of reaching a specific person as a respondent, importance of responses not being contaminated, sizes of data samples required for analysis, type of question to be asked to achieve the research objectives and the total number of questions to be asked for

data collection. The time available to collect data, financial implications of data collection and analysis, availability of field workers to assist and the use of automated data entry are resources that can also affect the choice of questionnaire. Having considered all these, this research will administer self-completed close-ended questionnaires (that are designed using the Universal Design for Learning Framework (UDL) principles) to the students Colleges of Education in Lagos State, Nigeria who are primarily trained to teach primary school students using teacher training materials and some teachers of primary schools in Lagos who are already teaching using these materials. Due to distance, accessibility and time, the questionnaires will be sent as google form links to the email-addresses of respondents and data responses will be automatically stored in a spreadsheet. The questionnaire will be useful in discovering the impact of teacher training materials to efficient learning of children with dyslexia while the interviews will be useful in understanding and exploring the reasons for the learning outcomes.

Quantitative data responses from the close-ended questions are statistically analyzed using MS-Excel analytical tool. The responses will be converted into percentages and analyzed using graphs and charts to properly understand and have a better picture of the research findings. Correlation analysis is conducted to investigate the impact of teacher training materials on the efficient learning of pupils with dyslexia. This correlation analysis is useful in assessing the strength in the relationship between the teacher training materials and learning outcomes and in identifying patterns and relationships in the data. Qualitative data responses from semi-structured telephone interviews is transcribed and then interpreted and organized into themes, patterns, relationships and categories since they cannot be measured like quantitative data. Content analysis is used to analyze the data responses in form of text and the frequency of the usage of words will be used to answer the research questions.

In simple-random sampling method, there is an equal chance of selecting units of a population as a sample (Lund Research, 2012). Therefore, the simple-random sampling technique is used to select 30 and 70 sample size respectively from the population (Colleges of Education in Lagos State and teachers of primary schools in Lagos state) to answer the close-ended questionnaire questions. The purposive sampling is used to select 3 participants for the semi-structured interview. This is because the researcher will purposely determine which course adviser, head of department and lecturer will be suitable in answering the research questions and achieving the research objectives.

Data Quality

Considering the pragmatism research philosophy, adductive reasoning approach, collection of data using semi-structured interview and close-ended questionnaires, the sampling techniques and the data analysis methods that will be employed in this research study, this research possesses high data validity as opposed to the lesser validity obtained when collecting secondary data only (Saunders, Lewis & Thornhill, 2012). The UDL framework is used to design the questionnaire to ensure that the principles guiding the Universal Design of Learning are reflected and captured in the questions. This is believed to improve the data reliability of the research study. Although it is usually difficult to attain generalizability since most research cannot select the whole population for time and cost reasons (Leung, 2015). However, the effective use of the simple-random sampling technique and the purposive sampling technique that is utilized in this research is expected to produce a reasonable amount of generalizability.

Presentation of Results

Rose and Meyer (2002) theorized three sets of principles to apply the three learning frameworks in the Universal Design for Learning Framework (UDL). The principles are the provision of a multiple means of representation which suggests the presentation of learning

contents in different medium such as video, audio, text, graphs, and other multimedia, provision of a multiple means of action and expression which suggests asking students to express their acquired knowledge in other formats such as short quizzes, scientific papers, assignments, interviews and multimedia presentations and the provision of a multiple means of engagement using strategies such as the delivery of lecture contents through question and answer sessions, peer-tutoring, open discussions and an applied practical real-life problem-solving approach (Al-Azawei, Serenelli, & Lundqvist, 2016). These principles alongside the awareness of primary school teachers in Lagos state has been used to develop the close-ended questionnaires administered to college of education students training to become primary school teachers and practicing primary school teachers to access their perspective about the teacher training materials. The five-point like scale ranging from strongly disagree to strongly agree was used to assess the UDL principles. 77 responses were received from the questionnaires and the breakdown and graphical illustration of the responses are presented in the section below.

The first dimension of assessing the understanding and awareness of respondents about dyslexia in the questionnaire is asking them about the age they think the symptom of dyslexia is likely to show in humans. As shown in Table: I below, out of a total of 77 respondents; only 2 thinks that dyslexia is likely to show between the ages of 0 to 2, 20 thinks dyslexia shows between the ages of 3 to 6, 50 thinks dyslexia begins to show between the ages of 6-12, 1 thinks dyslexia will begin to show between the ages of 12 to 18 and 3 respondents do not know the age range when the symptoms of dyslexia begins to show. From Table: I and Fig. 1, 65% of the respondents think dyslexia show within the age range of 6 to 12. This implies that majority of the respondents do not understand that dyslexia occurs in early childhood and there is a need to address it at this early stage of their lives (International Dyslexia Association, 2017; CAST, 2018). However, only 3% and 26% understand that dyslexia occur between the ages of 0 to 2 and 3 to 6 respectively. This shows a low level of understanding and awareness about dyslexia among the respondents.

Table: I

Likely Age	Frequency	Percentage
0-2	2	3
3-6	20	26
6-12	50	65
12-18	1	1
Don't know	3	5

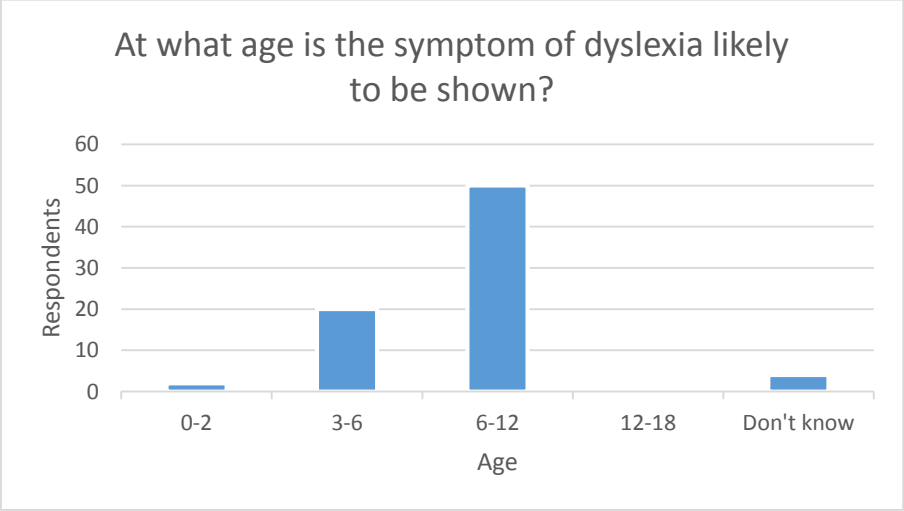

Fig. 1

The second dimension of assessing the understanding and awareness of respondents about dyslexia in the questionnaire is asking them about the characteristics of dyslexia. As shown in Table: II and Fig. 2 below, out of a total of 77 respondents; 20 people equivalent to 26% correctly indicated having difficulty with reading and spelling only (Catts et al., 2012; Thompson et al., 2015; Snowling et al., 2016). Others indicated a combination of other characteristics like having visual problems and reversing letters and words backwards which are characteristics or features that are not peculiar nor associated to students with dyslexia but to other students too. However, Colenbrander, Rickets, and Breadmore (2018) suggested that children that possesses a combination of risk factors should be alerted as warning signs indicating a possibility of dyslexia and therefore, should be properly monitored. 4% indicated that they do not know about the characteristics of dyslexia.

Table: II

Frequency	Key	Percentage	Characteristics of Dyslexia
3	A	4%	Don't know
20	B	26%	Having difficulty with reading and spelling
6	C	8%	Having difficulty with reading and spelling, Having visual problems
10	D	13%	Reversing letters and words backwards
31	E	40%	Reversing letters and words backwards, Having difficulty with reading and spelling
5	F	6%	Reversing letters and words backwards, having difficulty with reading and spelling, Having visual problems
2	Null	3%	

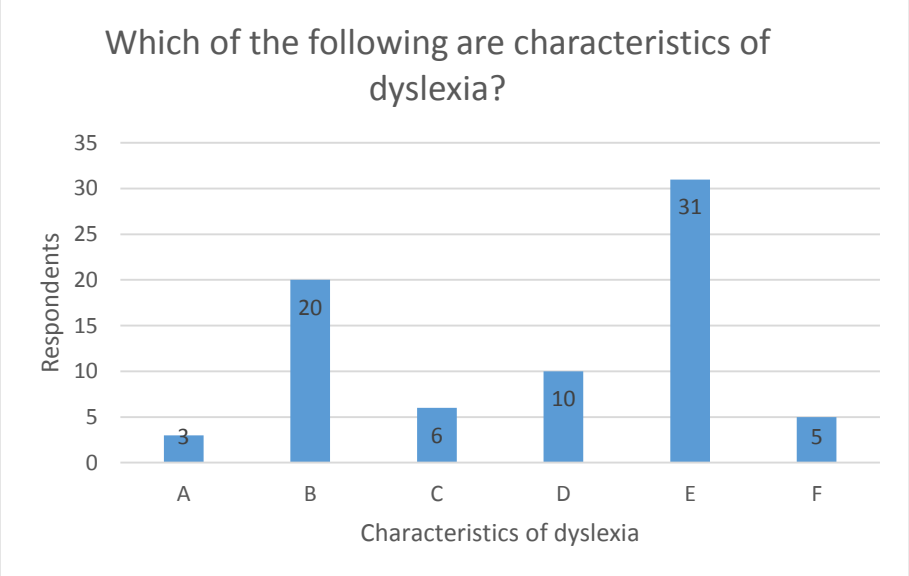

Fig. 2

The third dimension of assessing the understanding and awareness of respondents about dyslexia in the questionnaire is asking them about the causes of dyslexia. As shown in Table: III and Fig. 3 below, out of a total of 77 respondents; 42 which is equivalent to 55% indicated phonological deficits as the agreed cause of dyslexia, 10 which is equivalent to 13% indicated all of the given options as the agreed causes of dyslexia (phonological, environmental problems, social problems, and visual problems while 4 which is equivalent to 55 indicated

that they do not know about the causes of dyslexia. This implies that majority of the respondents understand that phonological deficits is one of the main signs of dyslexia.

Table: III

Key	Causes of Dyslexia	Frequency	Percentage
A	All of the above	10	13
B	Don't Know	4	5
C	Environmental problems	15	19
D	Phonological deficit	42	55
E	Social problems	2	3
F	Visual problems	4	5

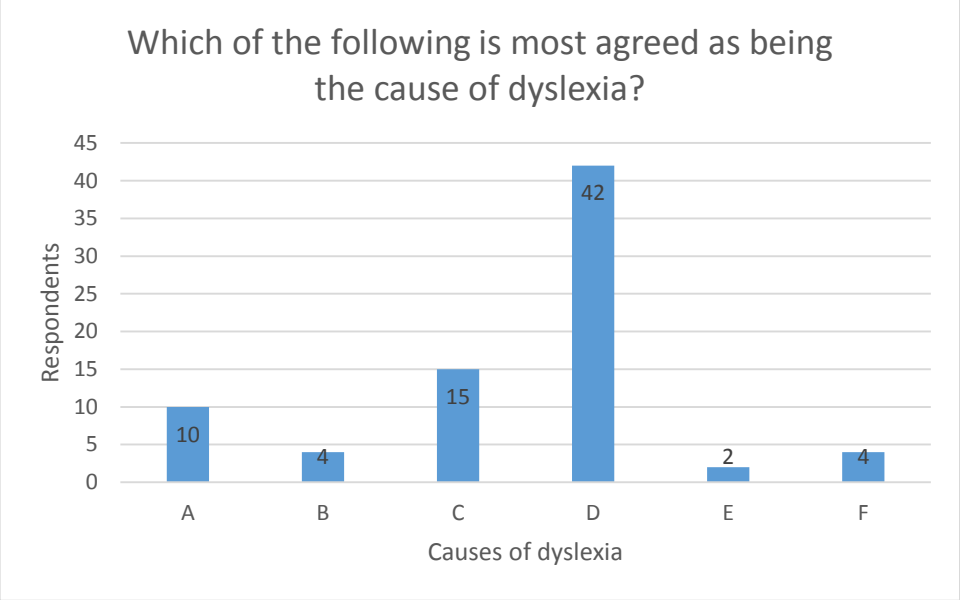

Fig. 3

The next dimension on assessing the understanding and awareness of respondents about dyslexia in the questionnaire is asking them how they would rate their knowledge about dyslexia. As shown in Table: IV and Fig. 4 below, out of a total of 77 respondents; 21 which is equivalent to 27 percent indicated very poor, 18 which is equivalent to 23 percent indicated above average while 3 which is equivalent to 4 percent indicated very good. This shows that majority of the respondents are not well aware or knowledgeable about dyslexia.

Table: IV

Knowledge about Dyslexia	Frequency	Percentage
Very poor	21	27
Below average	18	23
Average	14	18
Above average	18	23
Good	3	4
Very good	3	4

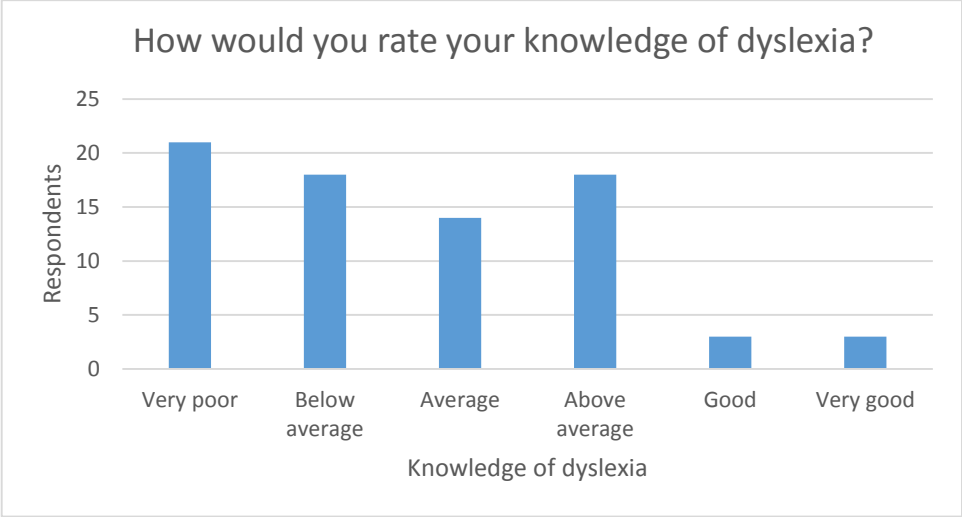

Fig. 4

The next dimension on assessing the understanding and awareness of respondents about dyslexia in the questionnaire is asking them about how confident they feel to teach students with dyslexia. As shown in Table: V and Fig. 5 below, out of a total of 77 respondents; 21 which is equivalent to 27 percent indicated not at all confident, 15 which is equivalent to 19 percent indicated neutral while 6 which is equivalent to 8 percent indicated very confident. This shows a very low confidence level of respondents' ability to teach students with dyslexia.

Table: V

Confidence Level	Frequency	Percentage
Not at all confident	21	27
Moderately not confident	19	25
Slightly not confident	7	9
Neutral	15	19
Slightly confident	6	8
Moderately confident	3	4
Very confident	6	8

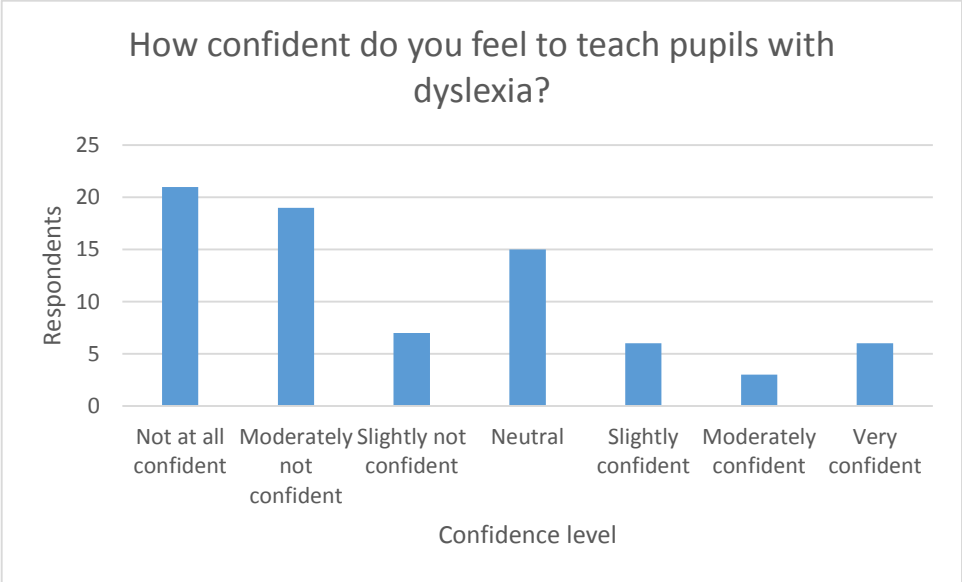

Fig. 5

The indices for assessing the principle of providing multiple means of representation for dyslexic students in the questionnaire administered comprised of 8 questions which are labelled A to H in Table: VI and Fig. 6 below. Question A represents whether student learning materials are presented in multiple formats such as: Video, audio, text, graphs and other multimedia. From Table: VI below, out of 77 respondents, 37 and 34 respondents indicated agree and strongly agree respectively, no respondent indicated strongly disagree and 4 respondents did not answer anything. Since 48% and 44% of the respondents with the highest ratio indicated agree and strongly agree, it implies that teacher training materials are presented in multiple formats.

Question B represents whether learning materials are sent to students beforehand to facilitate discussions in and out of class and note taking. From Table: VI below, out of 77 respondents, 36 and 28 respondents indicated agree and strongly agree respectively, no respondent indicated strongly disagree and 5 respondents did not answer anything. Since 47% and 36% of the respondents with the highest ratio indicated agree and strongly agree, it implies that learning materials are sent to students beforehand to facilitate discussions in and out of class and note taking.

Question C represents whether different technologies are used to illustrate vocabulary and symbols non-linguistically. From Table: VI below, out of 77 respondents, 42 and 24 respondents indicated agree and strongly agree respectively, 1 respondent indicated strongly disagree and 5 respondents did not answer anything. Since 55% and 31% of the respondents with the highest ratio indicated agree and strongly agree, it implies that different technologies are used to illustrate vocabulary and symbols non-linguistically.

Question D represents whether Video and audio recordings are used to narrate graphical representations. From Table: VI below, out of 77 respondents, 42 and 28 respondents indicated agree and strongly agree respectively, no respondent indicated strongly disagree and 3 respondents did not answer anything. Since 55% and 36% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Video and audio recordings are used to narrate graphical representations.

Question E represents whether Learning materials allow students to illustrate concepts through multiple media. From Table: VI below, out of 77 respondents, 44 and 30 respondents indicated agree and strongly agree respectively, no respondent indicated strongly disagree and 3 respondents did not answer anything. Since 57% and 39% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Learning materials allow students to illustrate concepts through multiple media.

Question F represents whether Learning materials promote understanding across languages. From Table: VI below, out of 77 respondents, 46 and 28 respondents indicated agree and strongly agree respectively, no respondent indicated strongly disagree and 1 respondent did not answer anything. Since 60% and 36% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Learning materials promote understanding across languages.

Question G represents whether Learning materials allows students to highlight features and relate them to ideas and knowledge stored in memory. From Table: VI below, out of 77 respondents, 42 and 30 respondents indicated agree and strongly agree respectively, 1 respondent indicated strongly disagree and 3 respondents did not answer anything. Since 55% and 39% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Learning materials allows students to highlight features and relate them to ideas and knowledge stored in memory.

Question H represents whether Learning materials allow students to activate background knowledge. From Table: VI below, out of 77 respondents, 39 and 31 respondents indicated agree and strongly agree respectively, no respondent indicated strongly disagree and 3

respondents did not answer anything. Since 51% and 40% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Learning materials allow students to activate background knowledge.

Table: VI

Questions	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Strongly disagree	0	0	1	0	0	0	1	0
Disagree	1	2	2	3	0	2	0	1
Neutral	1	6	3	1	0	0	1	3
Agree	37	36	42	42	44	46	42	39
Strongly agree	34	28	24	28	30	28	30	31
Null	4	5	5	3	3	1	3	3

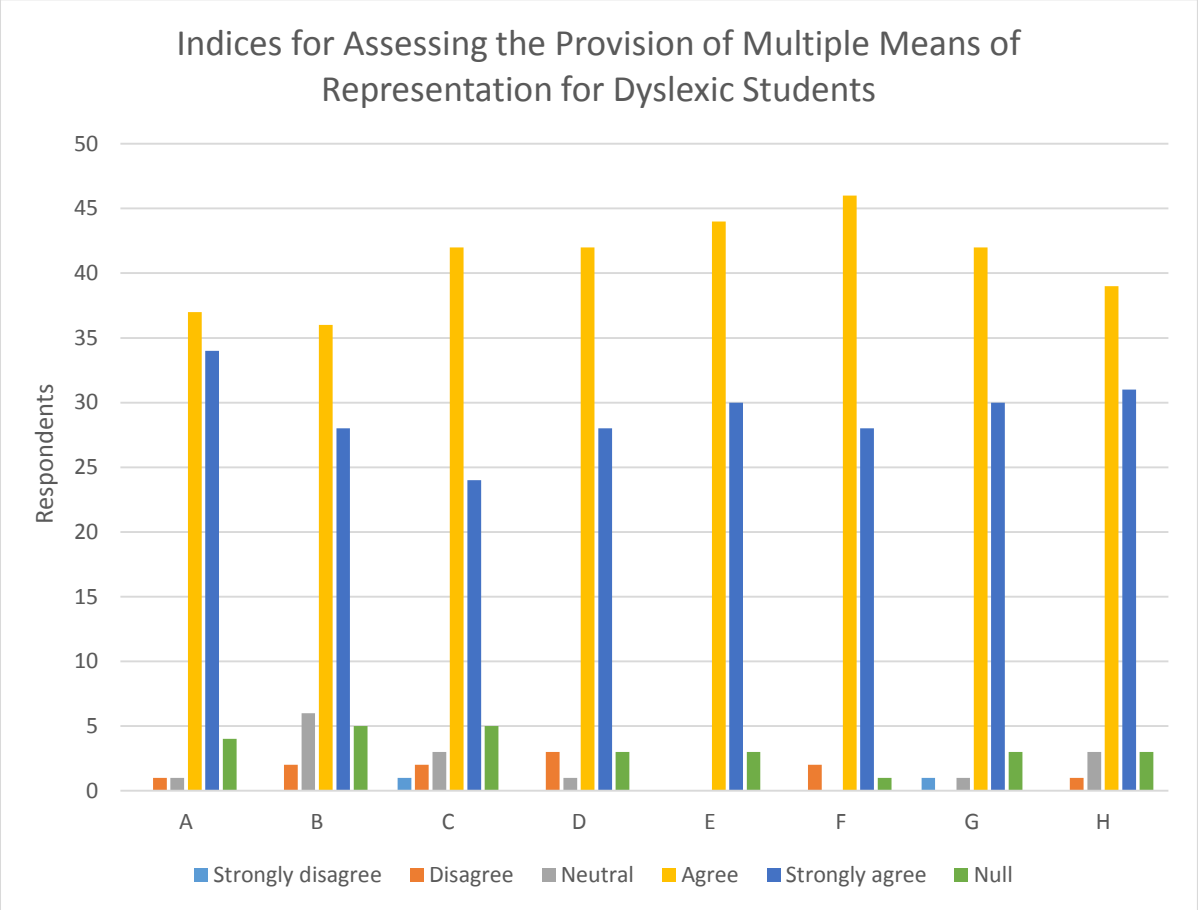

Fig. 6

The indices for assessing the principle of providing multiple means of Action & Expression for dyslexic students in the questionnaire administered comprised of 6 questions which are labelled A to F in Table: VII and Fig. 7 below. Question A represents whether Students are allowed to express their knowledge in formats such as: Assignments, interviews, short quizzes and other multimedia presentations. From Table: VII below, out of 77 respondents, 40 and 31 respondents indicated agree and strongly agree respectively, 1 respondent indicated strongly disagree and 4 respondents did not answer anything. Since 52% and 40% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Students are allowed to express their knowledge in formats such as: Assignments, interviews, short quizzes and other multimedia presentations.

Question B represents whether Exams are set in different question styles. From Table: VII below, out of 77 respondents, 42 and 27 respondents indicated agree and strongly agree respectively, no respondent indicated strongly disagree and 3 respondents did not answer anything. Since 55% and 35% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Exams are set in different question styles.

Question C represents whether Students are allowed to choose which questions they felt most comfortable addressing. From Table: VII below, out of 77 respondents, 37 and 21 respondents indicated agree and strongly agree respectively, no respondent indicated strongly disagree and 5 respondents did not answer anything. Since 48% and 27% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Students are allowed to choose which questions they felt most comfortable addressing.

Question D represents whether Students are allowed to address the questions in the manner they preferred. From Table: VII below, out of 77 respondents, 34 and 23 respondents indicated agree and strongly agree respectively, 2 respondents indicated strongly disagree and 7 respondents did not answer anything. Since 44% and 30% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Students are allowed to address the questions in the manner they preferred.

Question E represents whether Students are allowed to work in groups or independently. From Table: VII below, out of 77 respondents, 41 and 26 respondents indicated agree and strongly agree respectively, 1 respondent indicated strongly disagree and 6 respondents did not answer anything. Since 53% and 34% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Students are allowed to work in groups or independently.

Question F represents whether Students are allowed to choose due dates for assessments. From Table: VII below, out of 77 respondents, 7 and 4 respondents indicated agree and strongly agree respectively, 56 indicated disagree, 1 respondent indicated strongly disagree and 6 respondents did not answer anything. Since 73% of the respondents with the highest ratio indicated disagree, it implies that Students are not allowed to choose due dates for assessments.

Table: VII

Questions	**A**	**B**	**C**	**D**	**E**	**F**
Strongly disagree	1	0	0	2	1	5
Disagree	0	1	7	4	1	56
Neutral	1	4	7	7	2	2
Agree	40	42	37	34	41	7
Strongly agree	31	27	21	23	26	4
Null	4	3	5	7	6	3

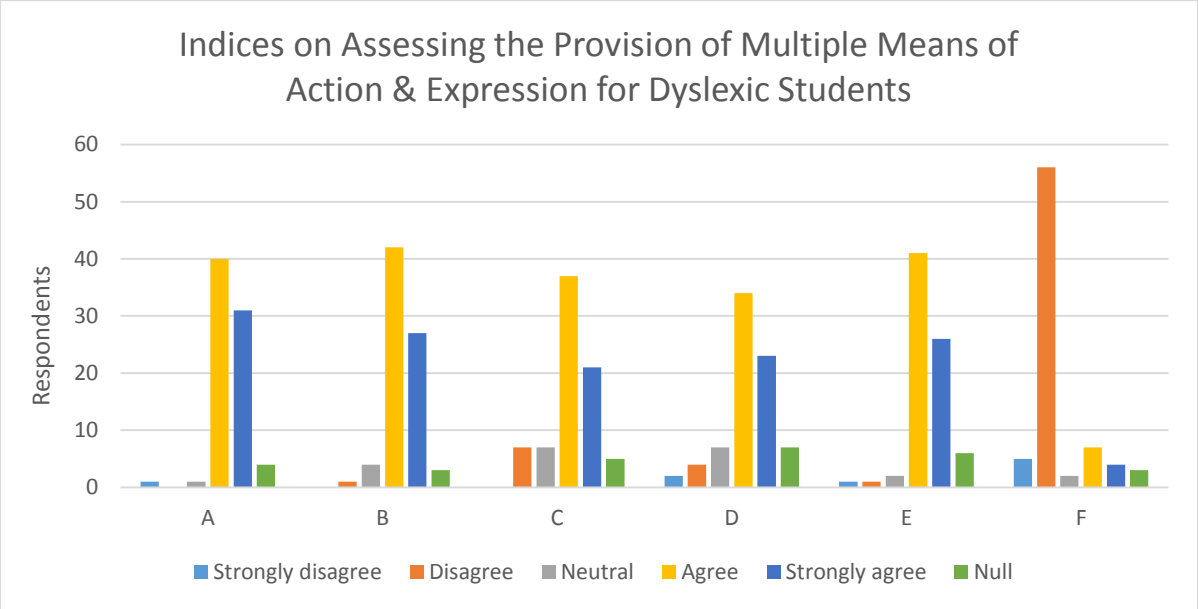

Fig. 7

The indices for assessing the principle of providing multiple means of Engagement for dyslexic students in the questionnaire administered comprised of 5 questions which are labelled A to E in Table: VIII and Fig. 8 below. Question A represents whether Classroom teaching are delivered using different strategies such as: open discussion, Q&A sessions, peer-tutoring, applied problem-solving approach. From Table VIII below, out of 77 respondents, 41 and 32 respondents indicated agree and strongly agree respectively, no respondent indicated strongly disagree and 3 respondents did not answer anything. Since 53% and 42% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Classroom teaching are delivered using different strategies such as: open discussion, Q&A sessions, peer-tutoring, applied problem-solving approach.

Question B represents whether Students have an open communication with teachers to discuss their individual learning needs. From Table: VIII below, out of 77 respondents, 43 and 25 respondents indicated agree and strongly agree respectively, no respondent indicated strongly disagree and 5 respondents did not answer anything. Since 56% and 32% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Students have an open communication with teachers to discuss their individual learning needs.

Question C represents whether Teacher training materials provides instructors with insights regarding the most appealing methods of representation to individual students based on communication. From Table: VIII below, out of 77 respondents, 44 and 20 respondents indicated agree and strongly agree respectively, 7 respondents indicated strongly disagree and 2 respondents did not answer anything. Since 57% and 26% of the respondents with the highest ratio indicated agree and strongly agree, it implies that Teacher training materials provides instructors with insights regarding the most appealing methods of representation to individual students based on communication.

Question D represents whether Students are allowed to make choices according to their interests and past experiences. From Table: VIII below, out of 77 respondents, 21 and 4 respondents indicated agree and strongly agree respectively, 9 respondents indicated strongly disagree, 37 respondents indicated disagree and 1 respondent did not answer anything. Since 48% of the respondents indicated disagree and it is the highest ratio, it implies that Students are not allowed to make choices according to their interests and past experiences.

Question E represents whether Students are allowed to reflect and provide their perspectives on lesson topics. From Table: VIII below, out of 77 respondents, 37 and 7 respondents indicated agree and strongly agree respectively, 14 respondents indicated strongly disagree, 15 respondents indicated disagree and 2 respondents did not answer anything. Since 44% of the respondents indicated agree and it is the highest ratio, it implies that Students are allowed to reflect and provide their perspectives on lesson topics.

Table: VIII

Questions	**A**	**B**	**C**	**D**	**E**
Strongly disagree	0	0	7	9	14
Disagree	0	3	2	37	15
Neutral	1	1	2	5	5
Agree	41	43	44	21	34
Strongly agree	32	25	20	4	7
Null	3	5	2	1	2

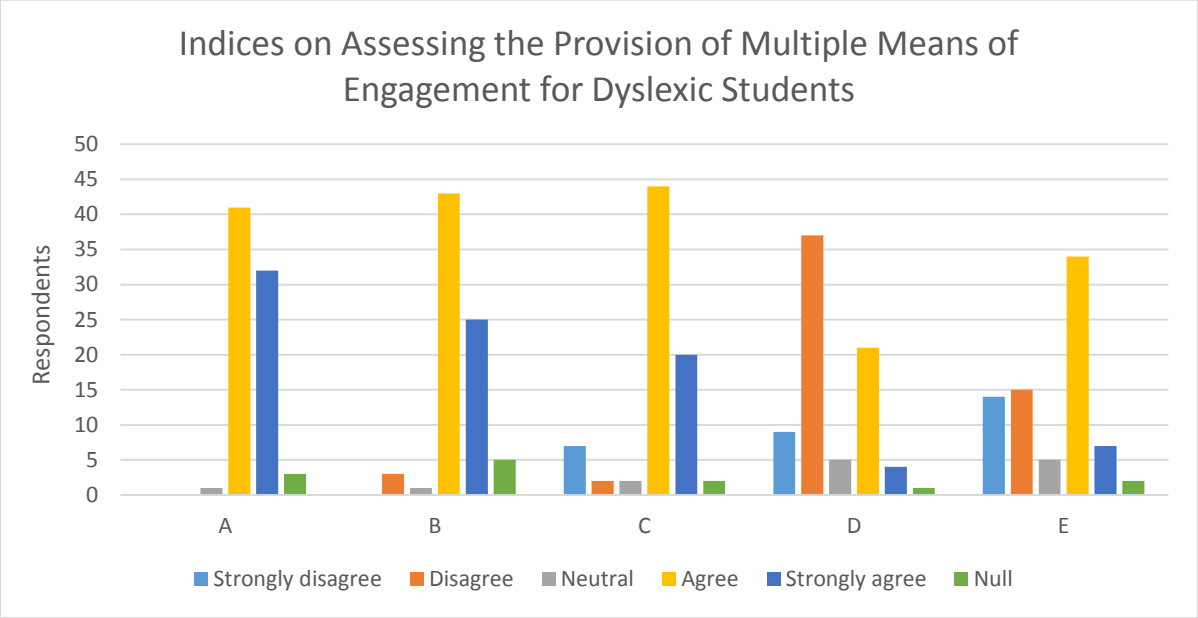

Fig. 8

To get a better perspective of the administrative positions and decision makers in the Nigeria Special Education department, this research collected qualitative data from respondents through an open-ended question in the administered questionnaire and received 77 responses. Also, through the semi-structured interviews that were conducted on 1 head teacher of a primary school, 1 dean of the Adeniran Ogunsanya College of Education and two lecturers of Federal College of Education all in Lagos state. Using content analysis, their responses are described below.

In the questionnaire that was analyzed in the previous section, an open-ended question was asked the respondents to enable them express themselves freely. The keywords emanating from the responses and frequency of usage is illustrated in Table: IX. Out of 77 responses, 24 uses simulation method to strategically attend to the special needs of their students with dyslexia, 17 indicated the use of interactive approach, 7 indicated patience as a strategy being used and 9 respondents returned no answer. Other responses included giving students extra time to work, provision of emotional support, teaching slowly, having a close relationship with students, taking time to explain well, regular follow up on students, provision of feedback, use

of instructional materials and asking for support from experts in the field of dyslexia. This implies the respondents are knowledgeable about strategies that will aid the learning needs of students with dyslexia as recorded by International Dyslexia Association (2017) and Catts and Petscher (2018).

Table: IX

Strategies	**Frequency**
Patience	7
Emotional Support	1
Extra Time to Work	3
Teaching Slowly	3
Close Relationship with students	3
Explanation Method	6
Interactive Approach	17
Simulation Method	24
Regular Follow-Up	1
Use of Instructional Materials	1
Providing Feedback	1
Asking for support from experts	1
Null	9

Furthermore, qualitative data was collected from 4 semi structured interviews conducted on a head teacher, a dean and 2 lecturers of a primary school and colleges of education that are training students to teach in primary schools in Lagos State. One of the respondents who is a male lecturer is fully aware about dyslexia and indicated that there is no special curriculum designed for students with dyslexia aside the general curriculum for special education. He indicated that available materials for teaching students with dyslexia are inadequate, damaged or outdated. He explained that conventional teaching aids are still being employed to teach the dyslexic students due to insufficient funding from the government. He however highlighted that the use of visual aids for have proven to be effective both for dyslexic and non-dyslexic students. He stated the problems of identification and insufficient consideration during lectures and exams are some of the challenges he has encountered in teaching students with dyslexia. He suggested the importance of understanding the individual needs of the dyslexic student and provide care to address these needs. His major training on the job has been his research study in special education as a PhD student. Therefore, he indicated his interest in attending trainings that will help him to develop more skills. He indicated that he has a high confidence level in handling students with dyslexia but does not mind seeking external assistance from experts in the field of dyslexia in supporting the specific needs of the students.

The second respondent who has been a lecturer for over 6 years at the college of education with a master degree in administration understands the term “learning disability” but has not come across the term “dyslexia” before until this interview. Hence, the interview could not be continued.

The third respondent is a primary school head teacher with over 20 years teaching experience. Surprisingly, the respondent indicated never hearing about the learning disability called dyslexia and said in her own words “I have not heard of these concepts before the first time, was when I went through your questionnaire and then I started to read what it was all about. I have been dealing with these cases without even knowing what I was really dealing with. It is more of an eye opener to me. Your questionnaire was helpful”. Hence, the interview could not be continued as well.

The fourth respondent who is a dean at the College of Education indicated his awareness and understanding about dyslexia by explaining that it is a difficulty in reading and spelling. He also confirmed the non-existence of a special curriculum for dyslexia but the general learning aid which are used by teachers to help the understanding of the children. He explained that the National Policy of Education in Nigeria covers dyslexia in its special education needs. He also highlighted some of the strategies he has adopted as an early lecturer in handling dyslexic students. In his own words, they include "What I did to motivate is to find out where they need encouragement, and give them extra attention, study their interest, talked to their classmates not to mock them because of their challenges but rather help and encourage them to improve so they have a sense of belonging. Showing them love and care while learning is the ultimate". He further indicated that his institution is open to new ideas on how to handle and improve teaching and learning process in the classroom.

Discussion of Findings

This research work seeks to investigate how teacher training materials used in primary education within Lagos state, Nigeria supports the efficient learning of pupils with dyslexia. Based on the Universal Design for Learning (UDL) Guidelines (CAST, 2018), this research seeks to answer the following questions: (i) To what extent does primary school teacher training materials provide multiple means of engagement for pupils with dyslexia in Lagos state, Nigeria?, (ii) To what extent does primary school teacher training materials provide multiple means of representation for pupils with dyslexia in Lagos state, Nigeria?, (iii) To what extent does primary school teacher training materials provide multiple means of action and expression for pupils with dyslexia in Lagos state, Nigeria?, (iv) To what extent are the teachers of primary schools in Lagos state, Nigeria aware about recent intervention strategies to support children with dyslexia and how well is this reflected in teacher training materials?, and (v) Are there training activities in place to equip teachers with the skills and knowledge required to support the learning of children with dyslexia?. Questionnaire and semi-structured interviews were administered and analyzed using quantitative and qualitative analysis respectively.

A breakdown of research of the research outcomes are illustrated and summarized in Tables: I-IX and Figs. 1-9. Based on the analysis of the teacher training materials using the Universal Design of Learning (UDL) framework, research outcomes show that teacher training materials are presented in multiple formats, learning materials are sent to students beforehand to facilitate discussions in and out of class and note taking, different technologies are used to illustrate vocabulary and symbols non-linguistically, Video and audio recordings are used to narrate graphical representations, Learning materials allow students to illustrate concepts through multiple media, Learning materials promote understanding across languages, Learning materials allows students to highlight features and relate them to ideas and knowledge stored in memory and Learning materials allow students to activate background knowledge. Hence, it can be said that the teacher training materials provide multiple means of representation for students with dyslexia.

In a bid to assessing if teacher training materials provide multiple means of action and expression, research outcomes show that the materials enable Students to express their knowledge in formats such as: Assignments, interviews, short quizzes and other multimedia presentations, Exams to be set in different question styles, Students to choose which questions they felt most comfortable addressing, Students to address the questions in the manner they preferred and allow Students to work in groups or independently. Hence, it can be said that to a great extent, the teacher training materials provide multiple means of action & expression for dyslexic students. However, it does not allow students to choose due dates for assessments. Therefore, this area should be modified so as to achieve the provision of a full means of action & expression to dyslexic students

In a bid to assessing if teacher training materials provide multiple means of engagement, research outcomes show that the materials allow Classroom teaching to be delivered using different strategies such as: open discussion, Q&A sessions, peer-tutoring, applied problem-solving approach; allows Students to have an open communication with teachers to discuss their individual learning needs; that the Teacher training materials provides instructors with insights regarding the most appealing methods of representation to individual students based on communication and that Students are allowed to reflect and provide their perspectives on lesson topics. Hence, it can be said that to a large extent that the teacher training materials provide multiple means of engagement. However, it does not allow students to make choices according to their interests and past experiences. Therefore, this area should be modified to enable the teacher training materials to provide a full means of engagement for dyslexic students.

A very low number of the respondents correctly indicated the symptoms of dyslexia as having difficulty with reading and spelling only (Carts et al., 2012; Thompson et al., 2015; Snowling et al., 2016). Others indicated a combination of other characteristics like having visual problems and reversing letters and words backwards which are characteristics or features that are not peculiar nor associated to students with dyslexia but to other students too. Although, Colenbrander, Ricketts, and Breadmore (2018) suggested that children that possesses a combination of risk factors should be alerted as warning signs indicating a possibility of dyslexia and therefore, should be properly monitored, it is not enough to categorize them as symptoms of dyslexia. In addition, majority of the respondents understand that phonological deficit is one of the main causes of dyslexia (Colenbrander, Ricketts, & Breadmore, 2018).

However, majority of the respondents do not understand that dyslexia occurs in early childhood and there is a need to address it at the early stage of their lives (International Dyslexia Association 2017; Catts & Petscher, 2018). Only 3% and 26% understand that dyslexia occur between the ages of 0 to 2 and 3 to 6 respectively. This shows a low level of understanding and awareness about dyslexia among the respondents. Comparing this result with the qualitative analysis collected from the interviews, two out of the four interviewees who are lecturers at the colleges of education do not understand what dyslexia means so the interview could not be continued with them. Majority of the respondents are not well aware or knowledgeable about dyslexia. This show a very low confidence level of respondents' ability to teach students with dyslexia.

Clearly, respondents are knowledgeable about strategies that will aid the learning needs of students with dyslexia as reported by International Dyslexia Association (2017) and Catts and Petscher (2018) but there is no special curriculum designed for students with dyslexia. They only follow the general curriculum for special education needs. From the quantitative and qualitative research analysis, it can be deduced and inferred that teacher training materials are designed to conform to the standards of the UDL framework but there is a problem of implementation because instructors are not well trained to understand dyslexia as a specific learning disability. Until, efforts are made to sensitize teachers about identifying and applying the standard principles to teaching students with dyslexia, optimum learning outcomes will not be achieved.

Conclusions

Statistical analysis and content analysis of the quantitative and qualitative data respectively reveals that teacher training materials used in primary schools for students in dyslexia do not have a special curriculum but runs the general curriculum for the special education under which learning disabilities such as dyslexia is covered. Overall, the teacher training materials conform to the three main principles of the Universal Design for Learning (UDL) Framework which are provision of multiple means of representation, action &

expression an engagement to a large extent. This means that according to King-Sears et al. (2015), the teacher training materials provides dyslexic students options for perception, expression, language, symbols and comprehension; options to communicate and express themselves, for physical action and executive function and multiple options of recruiting learner's interests, sustaining effort and persistence, and self-regulation which would help to minimize distractions during learning. It however does not allow students to make choices according to their interests and past experiences and does not allow students to choose due dates for assessments. It has been recommended that these areas should be modified so that they materials can fully provide multiple means of action & expression and engagement for the dyslexic students. However, majority of the respondents do not understand that dyslexia occurs in early childhood and there is a need to address it at the early stage of their lives (International Dyslexia Association 2017; Catts & Petscher, 2018). Only 3% and 26% understand that dyslexia occur between the ages of 0 to 2 and 3 to 6 respectively. This shows a low level of understanding and awareness about dyslexia among the respondents and a very low confidence level in respondents' ability to teach students with dyslexia.

Since, the teacher training materials are developed to conform to the UDL standards, respondents are knowledgeable about strategies that will aid the learning needs of students with dyslexia as reported by International Dyslexia Association (2017) and Catts and Petscher (2018) but there is no special curriculum designed for students with dyslexia. There is a problem of implementation because instructors are not well trained to understand dyslexia as a specific learning disability. Since respondents indicated their interests in undergoing trainings that will enable them acquire skills to handle dyslexic students, efforts should be made to sensitize students (intending teachers) and practicing teachers about identifying and applying the standard principles to teaching students with dyslexia so that optimum learning outcomes will not be achieved.

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