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Pedagogical Adaptation: Teaching Bahasa Melayu Phonics to Students with Autism in the State of Johor

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ABSTRACT

Education is a crucial concern that should be given top priority for all students. The phrase "special education student" is designated for a distinct cohort of students with special needs who undergo a distinct learning process compared to typical students. These students with unique needs are provided with a specialised curriculum and dedicated instructors who spend their time teaching them. This study aimed to assess the extent to which teachers utilise modules, oral language use and multimedia aspects in teaching Bahasa Melayu phonics. This study employs a quantitative research design and is substantiated by quantitative data. A sample of 42 special education teachers who specifically instruct autistic students was selected from four schools in the Johor region. A questionnaire survey was employed as a research instrument. Descriptive analysis was employed to calculate the percentage, mean, and standard deviation. The module approach construct is considered to be at a moderate level based on the data, with a minimum value of 3.43 and a standard deviation of 0.654. Compared to strategies used in oral language use, the multimedia elements approach is more advanced, with a minimum score of 4.14 and a standard deviation of 0.612. Hence, it is imperative to develop a customised programme that addresses the specific requirements of these pupils, considering factors such as scheduling, resources, cultural considerations, instructional methods, expert support, and community engagement.

Keywords: *Bahasa Melayu Phonics; Autistic Students; Module Usage; Oral Language Usage; Multimedia Elements Usage.*

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Adaptasi Pedagogi: Pengajaran Bahasa Melayu Fonik kepada Pelajar Autisme di Negeri Johor

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ABSTRAK

Pendidikan adalah isu penting yang harus diberikan keutamaan utama bagi semua pelajar. Frasa "pelajar pendidikan khas" merujuk kepada kumpulan pelajar yang mempunyai keperluan khas dan menjalani proses pembelajaran yang berbeza berbanding pelajar tipikal. Pelajar dengan keperluan unik ini diberikan kurikulum khas serta tenaga pengajar khusus yang menumpukan masa mereka untuk mengajar mereka. Kajian ini bertujuan menilai sejauh mana guru menggunakan modul, penggunaan bahasa lisan, dan aspek multimedia dalam pengajaran fonik Bahasa Melayu. Kajian ini menggunakan reka bentuk penyelidikan kuantitatif dan disokong oleh data kuantitatif. Sampel terdiri daripada 42 orang guru pendidikan khas yang mengajar pelajar autistik, dipilih dari empat sekolah di wilayah Johor. Instrumen penyelidikan yang digunakan ialah soal selidik. Analisis deskriptif digunakan untuk mengira peratusan, min, dan sisihan piawai. Berdasarkan data, pendekatan penggunaan modul berada pada tahap sederhana dengan nilai min 3.43 dan sisihan piawai 0.654. Berbanding strategi penggunaan bahasa lisan, pendekatan elemen multimedia adalah lebih maju dengan nilai min 4.14 dan sisihan piawai 0.612. Oleh itu, adalah penting untuk membangunkan program khusus yang memenuhi keperluan spesifik pelajar ini dengan mengambil kira faktor seperti jadual pembelajaran, sumber, pertimbangan budaya, kaedah pengajaran, sokongan pakar, dan penglibatan komuniti.

Kata Kunci: Fonik Bahasa Melayu; Pelajar Autistik; Penggunaan Modul; Penggunaan Bahasa Lisan; Penggunaan Elemen Multimedia.

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1.0 Introduction

Education is a fundamental right that should be universally provided to all children, irrespective of their social background and intellectual capacity. One strategy to enhance the educational attainment of these youngsters is to enhance their language proficiency, with instructors playing a pivotal role in this endeavor. Proficiency in language is a fundamental ability that should be given significant emphasis during classroom instruction and learning (Hassan & Rahman, 2021). Hence, educators should be attuned to the retrieval of ideas in the educational setting in order to address the issue of pupils attaining proficiency in reading abilities. The remedial programme serves as a means to address the issue of students who possess certain deficiencies.

Tar & Mahmud assert that utilising reading methods that are not tailored to students' needs might lead to rapid boredom and a loss of interest in the reading process, resulting in drowsiness. Preschool students who achieve proficiency in reading are more likely to excel academically from elementary school through high school (Carson, Bayetto & Roberts, 2019). Furthermore, the academic performance of proficient readers and struggling readers can be seen within the educational setting (Goldfeld et al., 2021). Consequently, as stated by Mahmudovna (2021), this will lead to a situation where pupils with fewer talents will lag behind in terms of academic performance.

Nevertheless, the designation "special education student" or "student with special needs" is employed to refer to a distinct subset of students. These students are commonly labelled as educationally disadvantaged, lacking skills, and less bright compared to their peers, although having their own advantages. This cohort of students has the potential to make valuable contributions if their talents are refined via sufficient attention and support. The educational process for pupils with special needs differs significantly from that of typical students. Students with exceptional needs receive a curriculum and competent instructors who prioritise skill enhancement (Hassan, 2019). This is encompassed by several components of the learning and teaching process, known as teaching and learning (TnL).

In order to cater to the needs of students with impairments, teachers should offer optimal instructional input to facilitate effective teaching and learning. Furthermore, educators who instruct pupils with exceptionalities must furnish suitable instructional materials as a crucial and primary foundation for instruction and acquisition. Students with special needs encounter various challenges in their learning, including conditions such as Down syndrome, cerebral palsy, hyperactivity, attention deficit disorder (ADD) /attention deficit hyperactivity disorder (ADHD), intellectual disability, emotional and behavioural issues, communication difficulties, epilepsy, dyslexia, and students with cognitive impairments. (Isaa & Kadirb, 2014).

A study conducted in Malaysia has revealed that individuals diagnosed with autism are predominantly male and represent diverse racial backgrounds. Based on the study, 80% of individuals are affected by mild autism, while the remaining 20% are affected by severe autism. According to research, 30% of autistic children in Malaysia do not receive any therapy. This is influenced by the belief system of different races in the country, as well as the impact of treating different diseases in developing nations (Saiman et al., 2013).

In addition, children with autism experience challenges in learning and frequently exhibit issues in maintaining focus, often appearing to be absorbed in their own thoughts or world.

Hence, it is imperative to provide these youngsters with a tailored approach in the teaching and learning process that is both engaging and appropriate for their cognitive abilities. These youngsters are not fit for studying in a conventional classroom due to their lack of attention. The information taught to mainstream pupils takes precedence over the teacher's directions. In order to guarantee that young children with autism receive an early education and acquire the fundamental abilities necessary to navigate daily life, parents and educators play a crucial part in their care. Rispoli, Mathes, & Malcolm (2019) discovered that children diagnosed with autism can acquire social skills through the collaborative efforts of educators and parents, utilising visual instruction, interaction with peers, and an enriching setting.

Students with a background of autism spectrum disorder (ASD) demonstrate basic reading skills that are average for their age. However, their level of comprehension falls below one to two standards compared to the general population norms (Goldman & Burke, 2019). While the majority of students possess a high level of ability, those with ASD may have challenges, particularly in the area of reading skills. If individuals are able to readily acquire fundamental reading abilities, such as phonics, they may nonetheless encounter difficulties in reading comprehension. Consequently, people perceive it as challenging to comprehend the entirety of the content being read. Moreover, children with autism typically encounter challenges in comprehending and assimilating verbal information efficiently. Their comprehension is mostly centred around visual cues, nonverbal communication, and spoken language exclusively (Nally et al., 2018).

The current study’s introduction lacks a critical analysis of the specific problems that students with ASD confront in gaining reading and comprehension abilities. Existing research highlights that many students with ASD experience difficulties in reading comprehension due to impairments in Theory of Mind, Weak Central Coherence, and Executive Functioning, which significantly impact their ability to process and interpret textual information (Nguyen et al., 2015). Moreover, research indicates that deficiencies in social cognition and narrative skills increase reading challenges, irrespective of age and language competency (Alnemr, 2020). These problems underline the importance of tailored pedagogical adjustments to enable ASD students to learn Bahasa Melayu phonics. However, a more thorough integration of past research is required to contextualise the issue within the specific linguistic and cultural environment of Johor, hence giving a firm foundation for the study’s logic.

Addressing these gaps will contribute to a more thorough understanding of the connection between ASD and phonics education, ultimately guiding educators in applying evidence-based interventions. Utilising reading modules as a reading approach has been found to enhance the reading skills of autistic kids (Satari et. al, 2020). Reading modules incorporate the utilisation of repeated reading approaches. Olinger (2022) claims that regular reading can enhance the reading skills of youngsters with learning difficulties. According to Howorth et. al (2019), teachers need to analyse and react to this approach according to the individual student's degree of accomplishment in order to facilitate language development in autistic children.

Habidin et al. (2021) found that the creation of narratives is influenced by various elements such as visual, auditory, and movement. These factors contribute to a continual process of adding information, which can be particularly beneficial for children with autism who require extra attention. Wati, Nuryani, and Devhy (2020) highlighted the significance of incorporating time management in the use of oral language storytelling approaches for teaching autistic children. Rather than imposing strict time limits, they suggested encouraging the children to

complete assignments at their own pace. The form of language employed during verbal communication is commonly referred to as spoken language or colloquial language. Furthermore, Aminuddin, Sabil, and Jamian (2020) discovered in their research that implementing oral language techniques is a means to enhance the learning capabilities of children with autism. Bay (2020) defines game elements as activities that can be incorporated into storytelling activities as part of a learning method, either directly or indirectly.

According to Anggraini, Rachmi, and Nargis (2019), employing spoken language is an effective approach to facilitating the reading process in autistic youngsters. Children can engage with multimedia technology through numerous means, including text, animation, sound, and moving images. They are also exposed to a range of different media. According to Athbah (2021), children who acquire reading skills through computer-based learning are able to engage in more effective interactions. It is a well-established fact that computers invariably incorporate media elements such as audio, graphics, and animation in communication, in addition to text. Utilising visually appealing graphic symbols might enhance comprehension and aid these children in terms of retention (Nara, Musnir & Situmorang, 2020). Using this feature, individuals have the ability to replay the audio recording they hear while articulating a word, phrase, or sentence until they comprehend it. As a means of reinforcing the pupils' knowledge, the teacher may also administer exercises that involve pressing a button to indicate the right response. Consequently, the use of multimedia-based teaching and learning approaches is appropriate for these kids with special education needs (Andrunyk et al., 2019).

A stronger critical engagement with the literature is needed to deepen the study's theoretical underpinning and emphasise how it builds upon or diverges from prior research. For instance, Lee & Wheldall (2011) explored word recognition among early readers of Malay, highlighting the role of direct instruction on phoneme-grapheme matching and syllable segmentation. Similarly, Lee & Lee (2021) studied the effectiveness of a phonics-based intervention for dyslexic learners, suggesting its potential relevance to different learner populations, including those with ASD. While these studies give useful insights, a fuller discussion on their applicability to ASD learners is necessary to put the current study within the broader research landscape. Furthermore, theoretical perspectives such as Vygotsky's sociocultural theory and the Universal Design for Learning (UDL) framework could offer important insights regarding individualised instruction and cognitive accessibility for ASD pupils. Incorporating these viewpoints would increase the study's academic rigor, ensuring that it contributes effectively to the field of special education and phonics instruction in Malaysia.

2.0 Objectives

In order to effectively teach reading to those with autism, it is necessary to have appropriate knowledge and methods. Special education teachers have a responsibility to assist these youngsters in managing their challenges. In order to achieve success in the TnL procedure performed on autistic children, it is necessary to design effective approaches and tactics. Hence, this investigation was undertaken to:

i) Assessing the extent of module utilisation as a pedagogical strategy for teaching Bahasa Melayu phonics by educators.
ii) Assessing the extent of oral language utilisation as a pedagogical strategy for teaching Bahasa Melayu phonics by educators.
iii) Assessing the extent of multimedia components utilisation as a pedagogical

strategy for teaching Bahasa Melayu phonics by educators.

Phonics is an instructional approach for reading that links specific symbols with corresponding sounds. The phonics technique is an instructional approach that teaches children the fundamental sounds in speech, helps them understand the connection between sounds and written symbols, and enables them to blend these sounds together to form syllables and words (Othman et al., 2016).

3.0 Methodology

The researcher opted for a descriptive methodology in this study, employing a questionnaire to collect quantitative data from the respondents. Researchers have found that the utilisation of questionnaires is cost-effective and facilitates respondents in providing answers more conveniently.

3.1 Population and Sample

The researcher employed the intentional random selection method in this survey as it aligns with the objective of the study, which is to investigate the approach utilised by special education teachers when teaching Bahasa Melayu phonics to children with autism. This study focuses on primary schools in the state of Johor that feature special education stream classrooms.

Only four of these schools satisfy the criteria established by the researcher, which requires that all children in the class have autism. For this study, a sample of 40 special education teachers was chosen to respond to the questionnaire. The sample selection in this study commenced by specifically targeting teachers who exclusively teach and have completed teaching courses for children with autism, as indicated in table 1.

Table 1: Distribution of the questionnaire's items

School	Total	Characteristic
A	10	Teachers who teach and have attended teaching courses for autistic students
B	9	
C	10	
D	11	

3.2 Instrument

To promote clarity and methodological rigour, this study adopted a structured survey instrument particularly constructed for this research, ensuring its agreement with the study's aims. The instrument has two sections: Section A, which gathers demographic information about teachers, and Section B, which assesses the pedagogical tactics employed in the TnL reading process for teaching Bahasa Melayu phonics to students with autism. To establish validity, the instrument underwent expert evaluation by specialists in special education and language instruction to assess content relevance and appropriateness (Boateng et al., 2018). Additionally, pilot research was done to modify the questionnaire based on participant comments, assuring clarity and applicability. Construct validity was then tested through component analysis to show that the

questions effectively measured the desired constructs (Taherdoost, 2016).

Reliability was tested using Cronbach's Alpha, obtaining a coefficient of 0.873, suggesting strong internal consistency. Regarding the sampling approach, purposive sampling was adopted to choose teachers with relevant skills and experience in teaching Bahasa Melayu phonics to autistic pupils, guaranteeing that participants could contribute significant insights. Measures were taken to sustain both reliability and validity, including consistent data collection techniques and guaranteeing participant diversity across different educational institutions. The three items are achieved by the use of modules, oral language communication and multimedia components, as depicted in table 2.

Table 2: Distribution of the questionnaire's items

Section	Construct	No. Item	Label
A	Demographic Information	5 Item	A1-A4
B	Teacher's Teaching and Learning Practices in the Classroom		
	1) Use of modules	8 Item	B1-B8
	2) Use of oral language	8 Item	B9-B16
	3) Use of multimedia elements	8 Item	B17-B24

3.3 Data analysis

Standardised tests have been employed to conduct descriptive statistical analysis methods in order to examine the disparity in average results when identifying the instructional approach employed by teachers in the TnL process of reading for autistic Bahasa Melayu phonics subjects. The data were analysed using the Statistical Package for Social Science (SPSS) software. Using the SPSS software, the researchers are able to more effectively analyse the data.

4.0 Result and Discussion

A total of 40 special education teachers participated in this study. The detailed demographic profile of the study participants is presented in Table 3.

Table 3: Characteristics of the individuals participating in the study

Demographics	Frequency	Percent
Gender		
Men	12	30%
Female	28	70%
Age		
20-25	1	2.5%
26-30	5	12.5%
31-35	9	22.5%
>36	25	62.5%
Teaching Experience		
1-5 years	5	12.5%
6-10 years	15	37.5%
11-15 years	6	15%

>16 years	14	35%
Experience Teaching Special Education Students 1-5 years 6-10 years 11-15 years >16 years	 7 14 13 6	 17.5% 35% 32.5% 15%
Number of Autistic Students taught 1-10 11-20 21-30 >31	 40 - - -	 100%

Table 3 presents the demographic characteristics of the participants in the study, categorised by gender, age, teaching experience duration, experience in teaching special education students, and the number of autistic students taught. There are 12 individuals, accounting for 30% of the total, who are male teachers. Conversely, there are 28 individuals, making up 70% of the total, who are female teachers. Based on the duration of their teaching experience, 5 teachers (12.5%) have taught for 1-5 years, 15 teachers (37.5%) have taught for 6-10 years, 6 teachers (15%) have taught for 11-15 years, and a total of 14 teachers (35%) have taught for more than 6 years. Out of the total number of teachers, 17.5% have experience teaching special education, while 35% have 6-10 years of experience, 32.5% have 11-15 years of experience, and 15% have more than 15 years of experience in the field of special education. All 40 teachers (100% of the respondents) have classes with just 1-10 autistic children.

Next, a descriptive analysis was performed to determine the amount of module approaches utilised by teachers in the TnL process of teaching Bahasa Melayu phonics to autistic pupils. Researchers utilise descriptive statistics to arrange and analyse data in order to obtain a coherent, concise, and comprehensible representation, enabling the extraction of specific insights from the data. The analysis included calculating the mean and standard deviation, as shown in table 4 below:

Table 4: Construct Level of Module Usage

No.	Textbook Use Item	Mean	Standard Deviation	Interpretation
B1	The provided modules are intriguing	3.43	0.712	Intermediate
B2	The provided modules are comprehensible	3.38	0.667	Intermediate
B3	The module's material aligns with the specific needs and growth of students with autism	3.33	0.656	Intermediate
B4	The modules offered aim to familiarise students with proper language usage	3.40	0.672	Intermediate
B5	TnL utilises modules that are designed to be more memorable for students	3.45	0.597	Intermediate
B6	Modules incorporating enjoyable features help foster students' motivation to engage in reading	3.45	0.639	Intermediate
B7	Modules are the optimal method for	3.35	0.662	Intermediate

	accommodating autistic students			
B8	Modules are beneficial for organising and designing lessons in the classroom	3.63	0.628	Intermediate
	Total	**3.43**	**0.654**	**Intermediate**

Table 4 indicates that every item within the module utilisation construct is classified as being at a moderate level. The item with the highest mean is " Modules are beneficial for organising and designing lessons in the classroom" (mean = 3.63 and standard deviation = 0.628). The item with the lowest mean is "The module's material aligns with the specific needs and growth of students with autism" with a mean score of 3.33 and a standard deviation of 0.656. In general, the utilisation of the module construct is at a modest level, with a mean of 3.43 and a standard deviation of 0.654. This module assists teachers in strategising the instruction for kids with autism.

The construct can be explored through essential criteria such as accessibility, flexibility, engagement, and efficacy. Accessibility guarantees that the module is user-friendly and matches the different learning skills of ASD students, while adaptability measures how well the module can be adapted to accommodate individual learning needs. According to Mukkiri et al. (2022), the implementation of the phonics reading module in the TnL process is expected to accelerate the reading progress of autistic children. This approach is a pedagogical technique known as effortless learning, which aims to minimise student errors. Implementing an error-free learning teaching style can enhance the reading proficiency of children with autism. Hilger (2022) asserts that error-free learning plays a crucial role in the educational advancement of children with autism. This reading module is utilised to enhance the reading skills of autistic students (O'Brien et al., 2018).

Learning modules are designed to provide structured guidance and direction to students throughout their studies. A follow-up module is an instructional tool created to direct a student's learning process in a particular subject. It is specifically developed to promote autonomous learning and self-directed study (Ihyembe et al., 2021). Module-based learning is an instructional approach where students receive supervision from the teacher and study lesson materials using printed guides or computer software. They then complete coursework based on the offered learning units. When creating a teaching material, such as a planned module, it is important to consider the diverse requirements and skills of students. This will help them become more accountable for regulating their own learning patterns. Lastly, efficacy analyses the influence of the module on phonics acquisition, measuring improvements in phonemic awareness, letter-sound correspondence, and word identification. Evaluating these qualities through teacher and student feedback, systematic observations, and pre-and post-intervention assessments will provide insight into the module's validity and pedagogical relevance in special education settings.

In order to determine the extent to which teachers made use of oral language in the TnL process of teaching Bahasa Melayu phonics to autistic students, an exploratory analysis was carried out. In order to determine the technique, the mean and standard deviation were computed, and the findings are shown in Table 5.

Table 5: Construct Levels of Oral Language Use

No.	Textbook Use Item	Mean	Standard Deviation	Interpretation
B9	Students attentively concentrate on the narration	3.23	0.800	Intermediate
B10	The utilisation of creative and witty language engrosses the attention of students	3.80	0.516	High
B11	Oral language is an instructional method that focuses on student-centered learning and involves acquiring knowledge through activities, such as play	3.85	0.427	High
B12	Utilising singing aspects in education facilitates better retention for student	3.93	0.417	High
B13	Oral communication has the ability to captivate the attention of students	3.68	0.572	High
B14	Oral communication incorporates enjoyable features that motivate pupils to engage in reading	3.58	0.636	Intermediate
B15	Oral language is highly suitable for usage with autistic students	3.48	0.599	Intermediate
B16	Oral communication aids teachers in strategizing instructional activities inside the educational setting	3.58	0.594	Intermediate
	Total	3.64	0.570	Intermediate

Table 5 indicates that every element within the oral language technique construct is categorised as either high or medium level. The item with the highest mean is "Utilising singing aspects in education facilitates better retention for students", with a mean of 3.93 and a standard deviation of 0.417. The item "Students attentively concentrate on the narration" has the lowest mean score of 3.23 and a standard deviation of 0.800. The overall level of the oral language technique construct is rather high, with a mean of 3.64 and a standard deviation of 0.570. It is evident that children with autism who have special needs have a greater inclination towards learning through singing approaches during the TnL process.

Language disorder refers to a deficiency in the ability to correctly pronounce and use spoken language, particularly in terms of voice, speech sounds, and fluency during communication. This condition manifests in various parts of language, including phonology, morphology, syntax, semantics, and pragmatics (Vogindroukas et al., 2022). Verbal expression refers to a student's ability to enunciate phonemes and syllables appropriately, a key skill in attaining phonics-based reading competency. Consequently, teachers might create several questions sets to enhance comprehension of language development and address this issue. Furthermore, teachers can employ oral descriptions, interviews, debates, the utilisation of videotapes, and administer standardised examinations to assess their students.

In their study, Nally et al. (2018) discovered that implementing oral language techniques is an effective approach to enhancing the learning capabilities of children with autism. This assertion is reinforced by the findings of Taresh et al. (2020), who suggest that employing this oral language use method can serve as an intervention for teaching

autistic youngsters to read. Thus, it is imperative for special education teachers to enhance the use of spoken language skills to engage the attention of autistic pupils throughout their TnL activities.

Pragmatic communication, including turn-taking, conversational skills, and contextual language use, is another crucial factor, as ASD learners usually struggle with the social aspects of oral language. Evaluating these concept levels through teacher assessments, planned speech activities, and intervention programs can assist in measuring the effectiveness of oral language practices in boosting phonics acquisition among autistic students. Implementing systematic, repetitive, and multimodal oral language exercises targeted at ASD learners will be vital in developing increased language comprehension and phonemic awareness in Bahasa Melayu training.

An exploratory analysis was conducted to assess the extent to which teachers utilised multimedia elements in the TnL process of teaching Bahasa Melayu phonics to autistic students. The methodology involved calculating the mean and standard deviation, and the results are presented in Table 6.

Table 6: Construct Level of Multimedia Elements use

No.	Textbook Use Item	Mean	Standard Deviation	Interpretation
B17	The multimedia elements (audio, video, graphics, animation) utilised are visually appealing and capable of delivering favourable sensory stimulation to kids with autism	4.25	0.588	High
B18	Utilising vibrant colours and dynamic animations effectively captivate students' interest throughout the TnL process	4.40	0.496	High
B19	Incorporating multimedia components such as audio, video, graphics, and animation can effectively engage students' attention	4.33	0.474	High
B20	Utilising multimedia features such as audio, video, graphics, and animation facilitate enhanced reading comprehension for students	3.90	0.744	High
B21	Utilising multimedia elements such as audio, video, graphics, and animation enhance students' ability to retain information	4.08	0.616	High
B22	Multimedia features such as audio, video, graphics, and animation possess enjoyable components that promote student engagement in reading	4.00	0.816	High
B23	Multimedia elements, including audio, video, graphics, and animation, are the most suitable method to employ while working with autistic students.	4.05	0.597	High
B24	The incorporation of multimedia components such as audio, video, graphics, and animation aid me in	4.13	0.563	High

	strategizing and organising my classroom lessons			
	Total	4.14	0.648	High

Table 6 indicates that every component within the framework of multimedia elements is classified as being at a high level. The item with the highest mean is "Utilising vibrant colours and dynamic animations effectively captivate students' interest throughout the TnL process" with a mean score of 4.40 and a standard deviation of 0.496. The item "Utilising multimedia features such as audio, video, graphics, and animation facilitate enhanced reading comprehension for students" has the lowest mean score of 3.90 and a standard deviation of 0.744. The multimedia element construct is very advanced, with a mean score of 4.14 and a standard deviation of 0.648. Hence, autistic students have a heightened inclination towards employing colour aspects and dynamic animation in their process of planning and decision-making. Interactivity refers to the extent to which multimedia tools, such as phonics-based instructional apps, interactive whiteboards, and digital storytelling, allow students to actively participate in the learning process, strengthening phonemic awareness through repetition and multisensory feedback.

The advent of information technology has revolutionised the modern workplace, offering streamlined processes and enhanced instructor efficacy. This includes the utilisation of technology for administrative jobs and instructional activities, particularly benefiting students with special educational needs. Special education children require engaging in educational activities to attain the same learning goals as their peers in regular education (Cheng & Lai, 2020). Thus, in order to cultivate students' enthusiasm for learning, it is crucial to employ suitable instructional materials that make the learning process enjoyable. Interactive multimedia is a pedagogical programme that integrates multiple computer-based resources into a single system for teaching purposes. Interactive multimedia enables special education children to engage both physically and mentally with the media, so enhancing their ability to gain mastery in learning.

The TnL method will be more intriguing, effective, and conducive to cultivating deeper comprehension. This is further substantiated by Cognitive Theory, which asserts that learning is facilitated more effectively through the use of multimedia aspects (such as visual and auditory stimuli) as opposed to traditional learning approaches that solely focus on reading written materials, such as books (Islam, Baki & River, 2021). According to Fung et al. (2021), students who have difficulties or come from autistic backgrounds can improve their engagement in reading by using different computer programmes. Thus, the inclusion of multimedia components significantly enhances the TnL process for autistic children.

Learning effectiveness analyses the influence of multimedia use on phonics acquisition, assessing increases in letter-sound recognition, word blending, and overall reading fluency. Evaluating these variables through teacher observations, student engagement measures, and pre-and post-intervention evaluations will provide insights into how multimedia features might be tuned to enhance phonics instruction for autistic students in Johor. A planned integration of multimedia resources into a customised phonics program can create improved engagement, retention, and literacy progress in ASD learners.

5.0 Conclusion

The study emphasises the differential efficiency of several pedagogical tactics in teaching Bahasa Melayu phonics to autistic pupils, emphasising the crucial impact of multimedia-enhanced teaching and learning (TnL) methods. While oral language use and teacher-led modules indicated moderate success, multimedia strategies proved to be more responsive to the cognitive needs of autistic learners. However, the study acknowledges limitations, including the reliance on descriptive analysis, which does not show causal correlations between teaching approaches and phonics acquisition. Additionally, variations in autism severity and individual learning preferences require further investigation to generate more tailored educational approaches. Future studies should include experimental designs and adaptive learning technologies to increase phonics training suited to autistic pupils.

To enable practical implementation of these findings, teacher training programs must include intensive, hands-on experiences, such as classroom placements and mentorship-based consulting approaches, rather than depending simply on theoretical courses. Policymakers should explore incorporating structured multimedia modules into the national special education curriculum to offer instructors accessible instructional resources. Given language processing delays in autistic children, phonics training should stress organised repetition, sequential learning, and gradual skill-building. Future studies should focus on adaptive teaching systems that change content delivery based on student success, further enhancing reading outcomes. By addressing these shortcomings, the study contributes to a more inclusive and successful phonics education framework for autistic students in Malaysia.

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