JCSHD

COGNITIVE SCIENCES AND HUMAN DEVELOPMENT

Early Literacy Challenges: Assessing English Letter-Sound Knowledge Post-COVID-19 in Malaysia

Audrey anak Francis* & Julia Lee Ai Cheng
Faculty of Cognitive Sciences and Human Development, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia.

ABSTRACT

The development of reading skills relies on understanding the connection between letters and their sounds, which is crucial for decoding and encoding words, as well as enhancing reading fluency and comprehension. In Malaysia, where students are expected to excel in both English and Malay, limited letter-sound knowledge can hinder literacy development and widen the gap between policy and practice. This issue was further magnified by the COVID-19 pandemic and prolonged school closures, disrupting students' exposure to English. This study assessed the English letter-sound knowledge of 11-year-old students in a primary school located in Sarawak, Malaysia, using the Phonics Adventure module on the READi website, an interactive assessment tool that evaluates phonics proficiency. A total of 54 students participated, completing tasks that measured their ability to identify and produce letter sounds. The findings revealed that while students demonstrated strong letter-name recognition, their letter-sound knowledge was weak, indicating challenges in phonemic awareness. This suggests that the pandemic-related school closures resulted in significant learning disruptions involving phonics acquisition, which is foundational for reading development. Addressing these gaps through targeted interventions is essential to support literacy recovery efforts.

Keywords: letter-sound knowledge, early literacy skills, COVID-19, learning loss, phonics assessment, phonemic awareness

ARTICLE INFO
Email address: audreyfrancis820@gmail.com (Audrey anak Francis)
*Corresponding author
https://doi.org/10.33736/jcshd.7426.2025
e-ISSN: 2550-1623

Manuscript received: 18 July 2024; Accepted: 22 September 2024; Date of publication: 31 March 2025

1 INTRODUCTION

Reading is essential for understanding written communication and developing literacy. Mastery of the alphabetic principle, including letter shapes, names, and sounds, determines reading proficiency, while early word pronunciation predicts academic success (Brown, 2014; Piasta et al., 2021). One of the main issues with reading is that young readers struggle to read words due to poor mastery of letter-sound correspondence (Gehsmann & Mesmer, 2023; Kang & Shin, 2019). According to Gehsmann and Mesmer (2023), understanding the connection between letters and their sounds is crucial for young readers to grasp the concept of words. This involves acquiring alphabet knowledge, phonological awareness, and phonemic awareness, which are essential for decoding, spelling, and writing (Buckingham et al., 2019; Gehsmann & Mesmer, 2023; Kang & Shin, 2019; Li & Woore, 2021; Miller, 2019).

Phonics instruction, which teaches the relationship between written letters and their sounds, is vital in early literacy for English speakers, English as a second language (ESL), and English for foreign language (EFL) speakers (Share, 2004). It focuses on teaching letter sounds before whole-word reading, which emphasises text meaning (Li & Woore, 2021). Phonics enables children to segment, pronounce, and blend phonemes, fostering reading and comprehension skills (Ehri, 2014).

The Malaysian government prioritises English proficiency for nation-building, as highlighted by the Ministry of Education (MOE) in the Malaysian Education Blueprint 2013-2025 and the English Roadmap 2015-2025 (MOE, 2013; MOE, 2015). English education formally begins in kindergarten (Salleh et al., 2020). However, there are growing concerns about learning loss in Malaysia due to the prolonged school closures during the COVID-19 pandemic (Ganeson, 2022; Georgiou & Parilla, 2022). According to the Organization for Economic Cooperation and Development (2023), literacy declined, where very few students achieved a score of level 5 or above in reading. Thus, school closures, limited teacher-pupil interaction, and technological barriers have worsened literacy outcomes, deepening gaps in preschool literacy (Coskun & Kara, 2022; UNICEF, 2021; World Bank, 2024).

1.1 Alphabet Knowledge (AK)

Early literacy development depends on a child's mastery of the alphabet's shapes, names, and sounds, forming the foundation for strong literacy skills (Heilmann et al., 2018; Townsend & Konold, 2010). Alphabet knowledge comprises four components: uppercase and lowercase letter naming, letter recognition, and letter sounds, which are key metrics for assessing a child's understanding and application of the alphabet (Drouin et al., 2012; Treiman & Kessler, 2003).

Jenner (2021) emphasised the significance of incorporating letter names and sounds in alphabet knowledge instruction to improve students' familiarity with letters. Using alphabet knowledge in literacy acquisition involves evaluating letter-name and letter-sound knowledge through tasks involving recognition, production, and writing (Piasta & Wagner, 2010). Additionally, Daamsgard et al. (2022) found that including kinesthetic activities is essential in alphabet knowledge, especially in aiding students in understanding letter-sound knowledge. Their research showed that

hand motor movements positively impacted children's letter-sound knowledge, while whole-body movements had longer-lasting effects (Daamsgard et al., 2022).

Alphabet knowledge is linked to print awareness and overall print understanding (Townsend & Konold, 2010). Children can connect written words to spoken ones, aided by the "own-name effect", where they recognise letters in their names (McKinnon, 2017). The alphabetic-order effect shows that first and last letters are easier to recall (Lee & Al Otaiba, 2017), while the letter-frequency effect indicates that frequently seen letters are learned faster (McKinnon, 2017). The National Early Literacy Panel (NELP) (2008) underscores the strong link between alphabet knowledge and reading and spelling skills. Furthermore, consistent participation in reading activities enhances the ability to identify letters and sounds, indicating a child's progression to the full alphabetic stage (Coskun et al., 2011), where processes such as decoding, reading fluency, and reading comprehension enable the child to transition from learning to read to reading to learn (Coskun et al., 2011).

1.1.1 Letter-Name Knowledge (LNK)

Letter-name knowledge (LNK), a critical subset of alphabet knowledge (AK), connects spoken words to written letter sequences (Piasta et al., 2022). Early exposure to letters in a child's environment fosters familiarity with their characteristics, aiding reading, spelling, and writing development (Dodd & Carr, 2003; Miller, 2019; Share, 2004). This exposure helps children recognise that printed letters represent specific sounds (Share, 2004). Letter names are often linked to sounds, as their structure reflects corresponding phonemes (Jenner, 2021; Piasta & Wagner, 2010). Learning letter names precedes letter sounds, supporting decoding through mastery of grapheme-phoneme relationships (Piasta & Wagner, 2010; Share, 2004). However, children do not all progress in literacy at the same rate (Piasta et al., 2021). Family socioeconomic status (SES) has been demonstrated to significantly influence language and literacy development in young children (Piasta et al., 2021). Studies show that children from low SES backgrounds have less knowledge of letter names than their higher SES peers, which hinders their literacy progress (Lee & Al Otaiba, 2015; Piasta et al., 2021)

1.1.2 Letter-Sound Knowledge (LSK)

Letter-sound knowledge (LSK), the connection between phonemes and graphemes, is foundational for reading development (Huang et al., 2014). A critical aspect of LSK is letter names, as many letters represent their sounds through consonant-vowel (CV) or vowel-consonant (VC) patterns (Piasta & Wagner, 2010; Share, 2004). Phonemic and phonological awareness emphasise the importance of LSK in English reading proficiency, as strong letter understanding helps children link letters with sounds (Huang et al., 2014).

Foy and Mann (2006) posited that letter sounds are commonly used to teach children how to read and spell because the consistent structure of letter sounds makes it easier to understand how letters correspond to sounds. However, the relationship between the names of letters and the sounds they represent is complex and diverse (Treiman & Kessler, 2003). Some letters, like C, W, F, and T, do

not directly correspond to the sounds they make, making it challenging for young readers to understand letter-sound connections (Ahmad & Yunus, 2019). Gordon (2010) further emphasises that excessive memorisation of letter names can hinder students' ability to learn the corresponding sounds. For example, a student who has memorised the letter T as "tee" may struggle to recall its correct sound. Therefore, educators should emphasise the letter T and clarify that its sound is /t/, as in the word "tiger" (Gordon, 2010). Additionally, according to Drouin et al. (2012), letter-sound tasks are considered “most difficult”, indicating that these tasks require a higher level of skill or understanding compared to tasks like letter recognition and letter naming.

1.2 Phonological and Phonemic Awareness in Early Reading Development

Phonological awareness, a foundational literacy skill, involves recognising and manipulating sound patterns in spoken language, including words, syllables, onsets, rimes, and phonemes (Milankov et al., 2021). Phonemic awareness, a subset of phonological awareness, focuses on identifying, differentiating, and manipulating individual phonemes, which are the smallest sound units that alter word meanings (Ehri, 2022). Proficiency in phonemic awareness equips children to connect phonemes to their corresponding graphemes, facilitating the development of LSK essential for reading fluency and comprehension (Buckingham et al., 2019).

Phonological and phonemic awareness skills can be cultivated through blending, segmenting, manipulating sounds, rhyming, and syllable recognition (Anthony & Francis, 2005; Ehri, 2022). For instance, teaching students to replace the initial sound in “pain” with /r/ to form “rain” enhances rhyming and phonemic manipulation (Carruth & Bustos, 2019). Children's participation in musical activities has consistently been associated with improved literacy skills (Kuppen & Bourke, 2017). Using sung or spoken rhyming texts offers a robust rhythmic framework that can prime phonological awareness and support word recognition, thereby contributing positively to their literacy advancement (Chen et al., 2016; Kuppen & Bourke, 2017). Similarly, strong syllable recognition enables emergent readers to decode words by breaking them into phonemes (Vazeux et al., 2020). Together, phonological and phonemic awareness provides the foundation for decoding, reading fluency, and comprehension, emphasising their critical role in early literacy development (International Literacy Association, 2019; Milankov et al., 2021).

1.3 Bilingualism in Malaysia

Bilingualism is common in Malaysia due to its diverse ethnic makeup (Norahim, 2019). As outlined in the Malaysian educational framework, English is learned as a second language (MOE, 2013; MOE, 2015). Studies show that bilinguals often rely on orthographic mapping for languages with similar alphabetic systems, like Malay and English (Lee et al., 2012). However, despite similarities, bilinguals may confuse letters with different pronunciations (Park & Piasta, 2023). Samuddin and Krish (2018) highlight that ESL students in Malaysia frequently make spelling errors due to a lack of orthographic knowledge in English, leading to overgeneralisation.

1.4 COVID-19 and Learning Losses

The COVID-19 pandemic forced global school closures, significantly disrupting education (Georgiou & Parilla, 2022). As a result of these prolonged closures, UNICEF (2020) reported notable learning losses, particularly in literacy and numeracy. Unfortunately, vulnerable groups bore the greatest impact (Sultana et al., 2022; UNICEF, 2020). Marginalised populations, including disadvantaged girls, children with disabilities, and ethnic minorities, were at an even greater risk of falling further behind (Munoz-Najar et al., 2021).

During the COVID-19 lockdown, remote learning became the primary method for continuing education (Munoz-Najar et al., 2021). However, students from low-income backgrounds faced significant barriers to access, including a lack of technology and devices, leading to digital inequalities (Ganeson, 2022). Many low-income students, especially those in rural areas, relied on a single free textbook per subject provided by the MOE and accessed lessons via their parents' mobile phones (Farudin, 2021; Phillips, 2021).

1.5 Problem Statement

Reading in English requires phonemic awareness, word recognition, fluency, and comprehension (Alhumsi & Shabdin, 2018). COVID-19 and school closures have significantly increased learning losses, particularly for lower socioeconomic students who lack technological resources (Georgiou & Parilla, 2022; Sultana et al., 2022; UNICEF, 2021). In Malaysia, where students are required to learn Malay and English, the disruption caused by COVID-19 restricted English exposure and interaction with teachers, especially for disadvantaged children (Farudin, 2021; Phillips, 2021). As a result, assessing the English proficiency of these children, whose early learning was disrupted, is essential.

The primary aim of this study was to assess whether 11-year-old students at a government primary school in Sarawak could recognise and pronounce English letter sounds correctly. The study's specific objectives were to determine whether:

1. Students know the sound of each letter in English.
2. Students can pronounce the sound of each letter in English.
3. Letter-name knowledge predicts letter-sound knowledge in English.
4. Students are better at letter sounds in capital or lowercase letters.

2 METHODS

2.1 Participants

The study involved 54 11-year-old students (27 males and 27 females) from diverse ethnic backgrounds at a government primary school in Sarawak, Malaysia. Initially, 71 students were

considered, 13 did not submit consent forms, and four were absent during the testing period. The average age of the participants was 10.87 years (*SD* = 0.26).

2.2 Design

This research utilised a quantitative, non-experimental descriptive design to investigate letter-sound knowledge in English among 11-year-old students at a school in Sarawak. Participants were selected using a purposive sampling method, with the inclusion criterion being that students were 7 years old during the COVID-19 lockdown in 2020. This period saw significant disruption to foundational reading skills due to unprecedented school closures lasting over 40 weeks, from March 18, 2020, to October 2021, when schools began to reopen gradually (UNICEF, 2021).

2.3 Instrument

This study employed the web-based reading intervention, READi, to assess letter sounds. The platform offers three learning modules: Alphabet Adventure, Handwriting Adventure, and Phonics Adventure, all accessible via computer or laptop. The school provided 20 laptops for the study; however, only 10 were utilised to ensure a quiet testing environment. Additionally, 10 pairs of earphones were available for students during the testing. Participants were instructed to complete the letter sound test within the Phonics Adventure module, with trained test enumerators applying error correction scripts throughout the assessment.

2.3.1 Measures

Students' ability to name letter sounds in English was assessed using the READi website's database, with scores assigned as follows: 0 = incorrect, 0.5 = partially correct, and 1 = correct. Incorrect answers included misidentified letter names or unclear recordings, while partially correct responses had overemphasised sounds.

The READi module featured an audio recording tool for capturing letter sound pronunciations and included 26 uppercase and 26 lowercase letters in random order. Students spoke their answers aloud, recorded themselves, and listened to confirm successful capture, allowing for up to two attempts for self-correction.

In both uppercase and lowercase letters, error correction focused on the first four letters—C, N, S, and G—to assess understanding of letter sounds and pronunciation of the remaining 48 letters. Each test enumerator used a standardised error correction script to ensure fairness in the assessment process.

2.4 Procedure

Before data collection began, a permission letter was sent to the school to request student participation. Ethics forms were distributed to parents, and upon receiving approval, the school

provided a list of students for registration on the READi website. Two accounts were created to separate student data.

In groups of ten, the students took turns to be brought to the computer lab, where they read the instructions displayed on-screen. Since the instructions were in English, many students required assistance. Test enumerators translated the instructions into Bahasa Melayu or Bahasa Sarawak. The students then recorded their pronunciations of the letter sounds and listened to the recordings before pressing the "submit" button. These recordings were subsequently evaluated for correctness and further analysed by two raters for interrater reliability. The interrater reliability test was conducted to ensure the validity and reliability of the scores the study's raters gave.

3 RESULTS

Data were analysed using descriptive statistics, linear regression, and a paired samples test.

3.1 Descriptive Statistics

Descriptive statistics on letter-sound knowledge were based on a corpus of 2,808 letters derived from the 54 students' attempts at the 52 upper – and lowercase letters (n = 54, M = 0.28, SD = 0.42). The scores used ranged from 0 to 1 (0 = Incorrect, 0.5 = Partially Correct, 1= Correct) with a total range of 1.0. The analysis revealed that 67.5% of the students scored 0 marks, 9.5% scored 0.5 points, and 23% scored 1 point on the overall letter sound testing (see Figure 1).

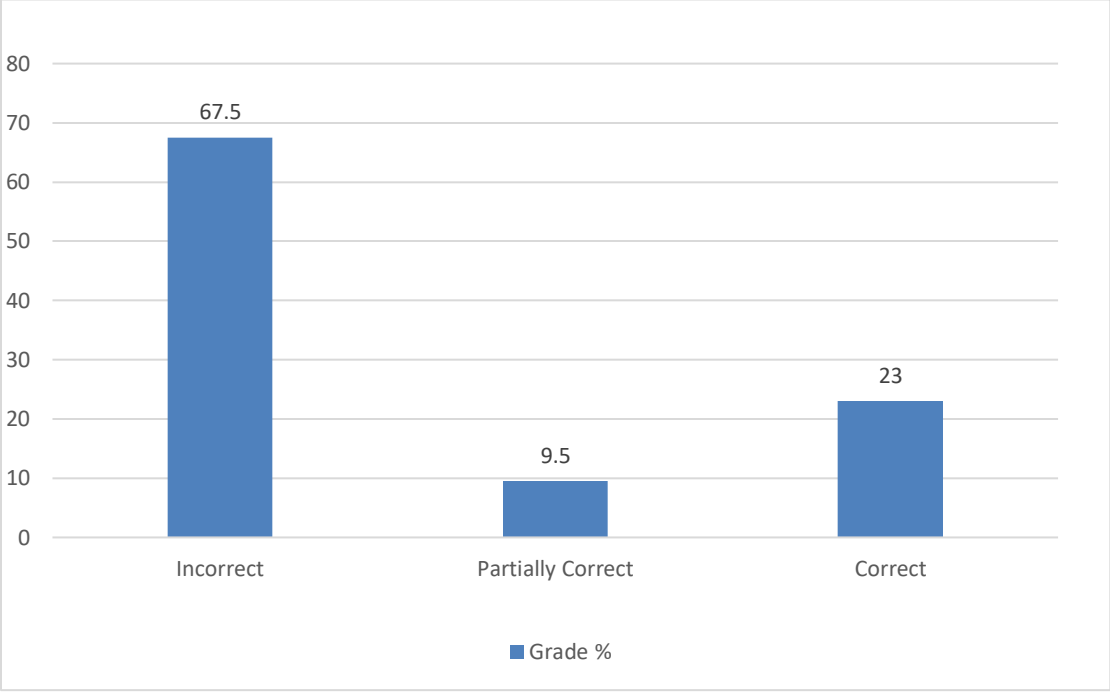


Figure 1. Percentage of incorrect, partially correct, and correct scores for LSK pronunciation.

3.2 Letter-sound Pronunciation Accuracy

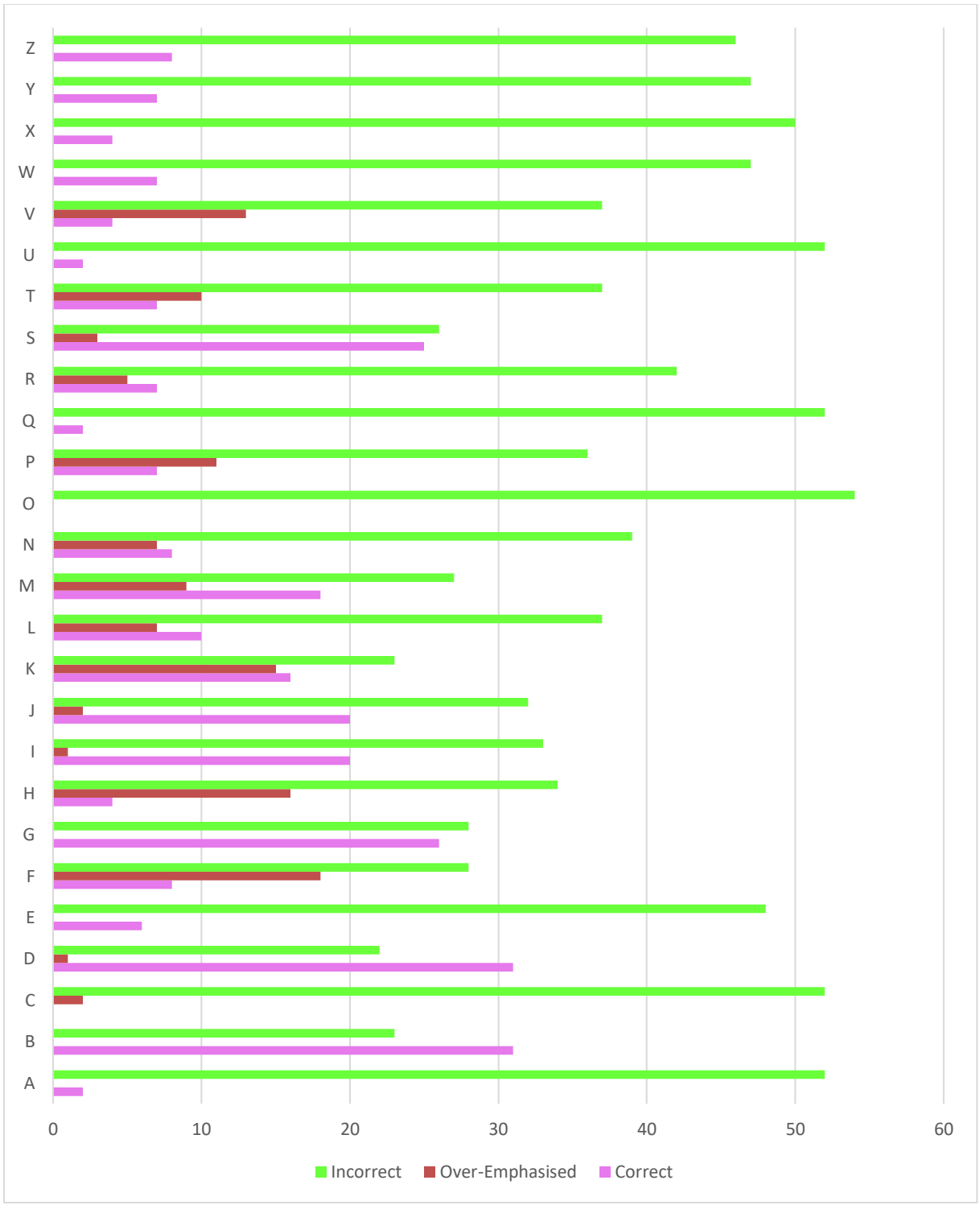
Table 1 highlights the most frequent errors made by students, including incorrect letter names and overemphasised letter sounds. These errors included adding a vowel-consonant extension, such as /pəh/, /fəh/, or /həh/, which were categorised as Partially Correct.

As shown in Table 1, students had the most difficulty producing correct sounds for uppercase letters O (*n* = 54), A (*n* = 52), C (*n* = 52), Q (*n* = 52), U (*n* = 52), X (*n* = 50), E (*n* = 48), and Y (*n* = 47). Overemphasised sounds were common with letters F (*n* = 18), H (*n* = 16), P (*n* = 11), K (*n* = 15), and T (*n* = 10). For lowercase letters, students struggled with u (*n* = 54), o (*n* = 51), x (*n* = 50), q (*n* = 49), q (*n* = 47), y (*n* = 46), e (*n* = 45), and c (*n* = 45). Overemphasised sounds were noted for f (*n* = 20), h (*n* = 19), k (*n* = 16), p (*n* = 16), and t (*n* = 16). Figures 2 and 3 provide a visual summary of these data trends.

Table 1. Summary of letters with incorrect and partially correct letter sounds.

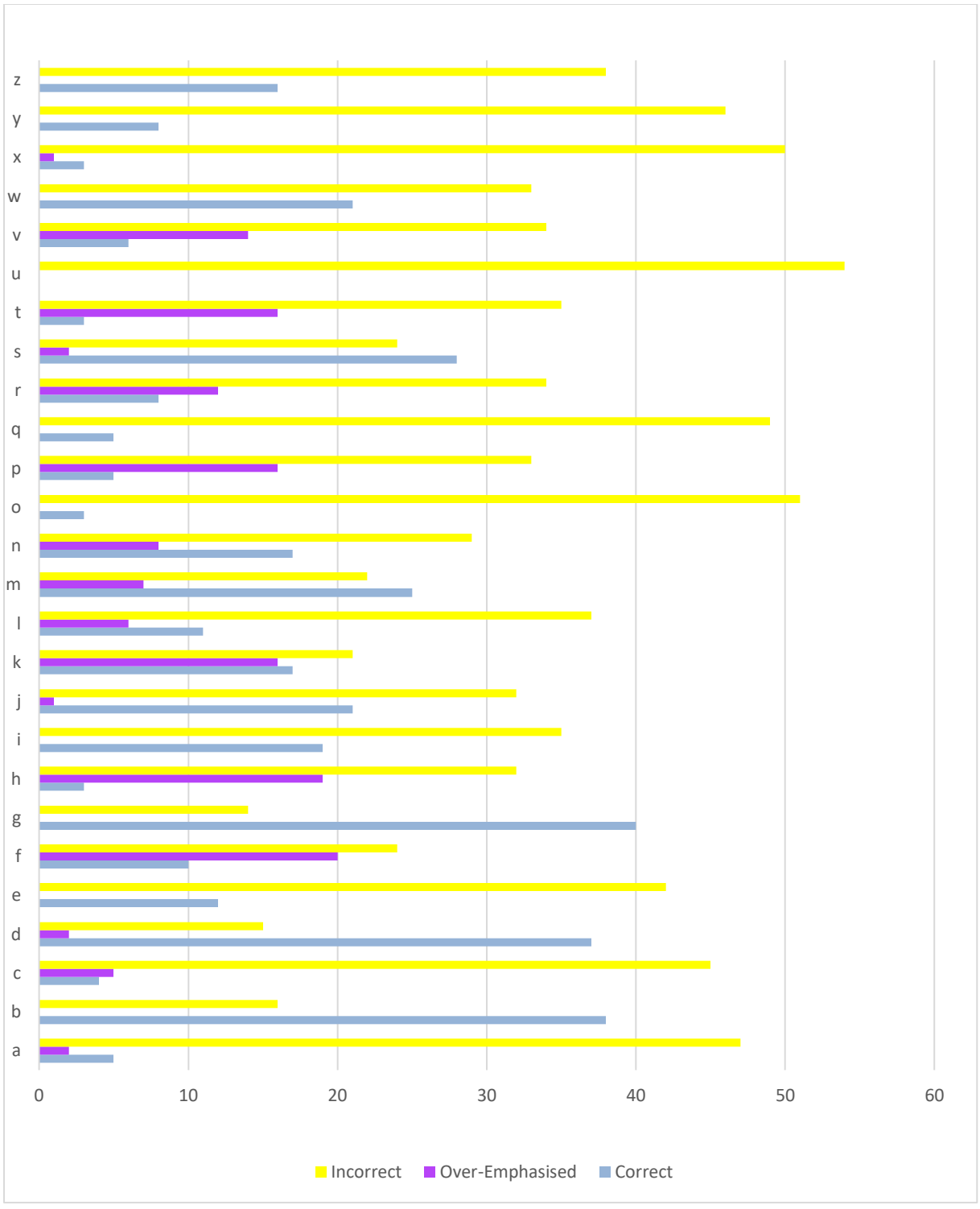
Uppercase	Incorrect	Partially correct	Lowercase	Incorrect	Partially correct
O	54	0	u	54	0
A	52	0	o	51	0
C	52	2	x	50	1
Q	52	0	q	49	0
U	52	0	a	47	2
X	50	0	y	46	0
E	48	0	e	42	0
Y	47	0	c	45	5
T	37	10	t	35	16
P	36	11	p	33	16
H	34	16	h	32	19
F	28	18	f	24	20
K	23	15	k	21	16

Note. Incorrect data is arranged from highest to lowest but Partially Correct data does not follow the same arrangement.



Note. The x-axis indicates the frequency of Incorrect and Partially Correct letter pronunciation. The y-axis indicates the answers given by the students in the study.

Figure 2. Overview of the accuracy of uppercase letter-sound pronunciation.



Note. The x-axis indicates the frequency of Incorrect and Partially Correct letter pronunciation. The y-axis indicates the answers given by the students in the study.

Figure 3. Overview of the accuracy of lowercase letter-sound pronunciation.

3.3 Relationship between Letter-Name Knowledge and Letter-Sound Knowledge

Linear regression was performed to examine the relationship between letter-name knowledge (LNK) and letter-sound knowledge (LSK) and to assess whether LNK predicts LSK. The analysis presented revealed a weak predictive power ($R^2 = 0.03$), with a p-value of 0.29, indicating no significant predictive relationship ($p > 0.05$). The 95% confidence interval for the coefficients (-0.04 to 0.12) further supports that LNK does not meaningfully predict LSK in this study (see Table 2).

3.4 Comparisons between uppercase and lowercase scores

A paired samples t-test was conducted to compare the uppercase and lowercase letter scores. The results showed a significant difference between uppercase letter scores ($M = 0.24$, $SD = 0.40$) and lowercase letter marks ($M = 0.31$, $SD = 0.43$). The t-value was -7.19, and the p-value was less than 0.001, indicating that students performed better at sounding out lowercase letters than uppercase letters (see Table 3).

Table 2. Linear regression analysis for LNK-LSK relationship.

Model	B	Std. Error	β	t	p	95% CI	
						LB	UB
Constant	.24	.04		6.13	<.001	.16	.31
LNK Pronunciation	.04	.04	.02	1.06	.29	-.04	.12

Note. B = Unstandardized Coefficient, β = Standardized Coefficient, CI = Confidence Interval, LB = Lower Bound, UB = Upper Bound, $R^2 = .000$

Table 3. Mean of uppercase-lowercase letter marks.

	Measures	Mean	Std. Deviation	t	p (two-sided)
Pair 1	Uppercase marks	.24	.40		
	Lowercase marks	.31	.43		
	Difference (Upper-Lower)	-.07	.37	-7.19	<.001

Note. This table combines the Descriptive Statistics and Paired Samples Test for uppercase and lowercase letter marks. The difference value is calculated using the mean of uppercase marks from the mean of lowercase marks.

3.5 Inter-Rater Reliability

Cohen's Kappa reliability test was conducted to assess the level of agreement between two raters on the marks given to the student's letter-sound pronunciation. A Kappa value of 0.68 indicates substantial agreement, as values between 0.61 and 0.8 indicate a high level of consistency. The results demonstrate significant agreement between the raters (t-value = 21.50, $p < 0.001$).

4 DISCUSSION

The findings indicate that students struggle significantly with English letter sounds, a concern given their age of 11. This suggests that they lack the sublexical skills needed for English proficiency despite Malaysia's emphasis on English as a second language. These students should have achieved age-appropriate proficiency, as letter names and sounds are standard components of early English education. However, prolonged school closures during COVID-19 disrupted learning and hindered the development of grapheme-phoneme correspondence, contributing to the high frequency of low scores observed.

In this study, students were concurrently learning English and Malay, with the latter potentially influencing their ability to map English phonics. A previous study has shown that bilinguals often rely on orthographic mapping for languages with similar alphabetic systems, such as Malay and English. However, despite these similarities, confusion can arise due to differences in pronunciation. The overemphasised pronunciation of English letter sounds, such as /fəh/ for /f/, /həh/ for /h/, and /kəh/ for /k/, suggests a stronger foundation in Malay phonics. Initially, it was believed that Malay phonological knowledge interfered with English pronunciation, but Park and Piasta (2023) suggest that a first language can facilitate second language acquisition. Additionally, the dominance of Malay in daily interactions and alphabet learning may place English in a subordinate role, affecting the students' English phonics development.

Furthermore, technological limitations and lack of access to technology likely contributed to reduced engagement in reading activities, English language exposure, and other school subjects. Media reports highlight that underprivileged students faced significant challenges during the lockdown, leading to a rise in learning setbacks, as documented by UNICEF (2020; 2021) and the World Bank (2024).

The study found that students' letter-sound knowledge did not develop alongside their familiarity with letter names. While teaching letter names is a common strategy for introducing letter sounds (Treiman & Kessler, 2003), and English letter names often contain corresponding sounds (Piasta & Wagner, 2010), the results showed more incorrect than correct letter-sound pronunciations. Piasta and Wagner (2010) argue that mastering letter names should enable accurate letter-sound production, yet this was not observed. Online learning and the lack of teacher presence during the pandemic may have hindered letter-sound acquisition due to the lack of physical interaction and multisensory teaching methods.

The study found that students demonstrated better phonemic awareness for lowercase letters than uppercase letters. This distinction may be attributed to the distinctive characteristics of lowercase letters, such as their varying heights and shapes, which make them more visually recognisable. These findings suggest that lowercase letters play a crucial role in enhancing letter recognition and phonemic awareness, possibly due to their frequent use in written materials and natural text exposure. Consequently, the familiarity and ease of recognising lowercase letters may contribute to improved reading fluency and accuracy.

However, this study has limitations, including the lack of consideration for students' socioeconomic status, daily language use, and parents' education levels. Conducted in a single school with only 54 students from one age group, the results may not accurately reflect the acquisition speed and proficiency of letter-sound knowledge across different educational institutions and age groups. Additionally, the study did not account for parents' educational backgrounds, which could influence students' development of letter-sound knowledge.

In conclusion, letter-sound knowledge is vital for ESL learners as it underpins reading, writing, decoding, and spelling in English. The disparity between letter names and sounds demands attention, particularly in Malaysia, where improving English proficiency is a national priority. Implementing reading interventions with systematic and explicit phonics instruction can help bridge this gap. These strategies should emphasise proper English letter-sound introduction and distinctions from Malay phonics, enabling ESL students to blend phonemes effectively. This approach will foster fluent, accurate, and automatic reading, enhancing overall English competency.

ACKNOWLEDGEMENTS

This research was funded by the Ministry of Higher Education of Malaysia under the Fundamental Research Grant Scheme (FRGS/1/2022/SSI07/UNIMAS/02/4). We would like to thank the school teachers, principal, and assistant principal for making this study possible and the children for participating in it.

REFERENCES

Ahmad, Z., & Yunus, M. M. (2019). The effectiveness of using jolly phonics blending phonemes to Year 3 English Language classroom. *International Journal of Humanities, Philosophy and Language*, *2*(8), 150–162. https://doi.org/10.35631/ijhpl.280011

Alhumsi, M. H. & Shabdin, A. A. (2018). The awareness of phonemes among Malaysian beginning readers. *Asian EFL Journal, 20*(4), 155–179. http://dsgate.uum.edu.my:8080/jspui/handle/123456789/4140

Anthony., J. L., & Francis, D. J. (2005). Development of phonological awareness. *Current Directions in Psychological Science, 14*(5), 255–259. https://doi.org/10.1111/j.0963-7214.2005.00376.x

Brown, C. S. (2014). Language and literacy development in the early years: Foundational skills that support emergent readers. *The Language and Literacy Spectrum, 24*, 35–49. https://files.eric.ed.gov/fulltext/EJ1034914.pdf

Buckingham, J., Wheldell, R., & Wheldell, K. (2019). Systematic and explicit phonics instruction: A scientific, evidence-based approach to teaching the alphabetic principle. In R. Cox, S. Feez & L. Beveridge (Eds.), *The alphabetic principle and beyond*. Primary English Teaching Association Australia. https://hdl.handle.net/1959.11/26530

Carruth, L., & Bustos, C. (2019). Phonemic awareness: It's all in the sounds of language. In Hendrix E. E. & Pule, H (Eds.*), Texas association of literacy education yearbook volume 6: discover the heart of literacy* (pp. 55–58). Texas Association for Literacy Education. https://eric.ed.gov/?id=EJ1291358

Chen, Q.-R., Zhang, J., Xu, X., Christoph Scheepers, Yang, Y., & Tanenhaus, M. K. (2016). Prosodic expectations in silent reading: ERP evidence from rhyme scheme and semantic congruence in classic Chinese poems. *Cognition, 154*, 11–21. https://doi.org/10.1016/j.cognition.2016.05.007

Coskun, K., & Kara, C. (2022). Impact of school closure due to COVID-19 on phonemic awareness of first-grade primary school children. *Humanities and Social Sciences Communications, 9*(196), 1–9. https://doi.org/10.1057/s41599-022-01218-0

Coskun, K., Oksuz, Y., Malek. B., Ici, A., & Akturk, M. (2011). *Can the children really recognize name of the letters?* [Conference presentation]. British Educational Research Association Annual Conference 2011, Institute of Education, London, United Kingdom. https://www.academia.edu/1881110/Can_the_Children_Really_Recognize_the_Names_of_the_Letters

Daamsgard, L., Nielsen, A-M. V., Gejl, A. K., Malling, A. S. B., Jensen, S. K. J., & Wienecke, J. (2022). Effects of 8 weeks with embodied learning on 5-6-year old Danish children's pre-reading skills and word reading skills: the PLAYMORE Project, DK. *Educational Psychology Review, 34*, 1709–1737. https://doi.org/10.1007/s10648-022-09671-8

Dodd, B., & Carr, A. (2003). Young children's letter-sound knowledge. *Language Speech and Hearing Services in Schools, 34*(2), 128–137. https://doi.org/10.1044/0161-1461(2003/011)

Drouin, M., Horner, S. L., & Sondergeld, T. A. (2012). Alphabet knowledge in preschool: A Rasch Model analysis. *Early Childhood Research Quarterly, 27*(3), 543–554. https://doi.org/10.1016/j.ecresq.2011.12.008

Ehri, L. C. (2014). Orthographic mapping in the acquisition of sight word reading, spelling memory, and vocabulary learning. *Scientific Studies of Reading, 18*(1), 5–21. https://doi.org/10.1080/10888438.2013.819356

Ehri, L. C. (2022). What teachers need to know and do to teach letter–sounds, phonemic awareness, word reading, and phonics. *The Reading Teacher*, *76*(1). https://doi.org/10.1002/trtr.2095

Farudin, F. (2021, July 2). Educationists warn of 'lost generation' as poorer students struggle online. *MalaysiaNow*. https://www.malaysianow.com/news/2021/07/02/educationists-warn-of-lost-generation-as-poorer-students-struggle-online

Foy, J., & Mann, V. A. (2006). Changes in letter sound knowledge are associated with development of phonological awareness in pre-school children. *Journal of Research in Reading, 29*(2), 143–161. https://doi.org/10.1111/j.1467-9817.2006.00279.x

Ganeson, D. (2022, December 19). Inequities worsen learning loss in Malaysia. *The Sun.* https://thesun.my/opinion_news/inequities-worsen-learning-loss-in-malaysia-BK10380414

Gehsmann, K. M., & Mesmer, H. A. E. (2023). The alphabetic principle and concept of word in text: Two priorities for learners in the emergent stage of literacy development. *The Reading Teacher*, *77*(2), 156–166. https://doi.org/10.1002/trtr.2225

Georgiou, G. K., & Parilla, R. (2022). Covid-19 and literacy: An introduction to the special issue. *Reading and Writing*, *36*(2), 241–243. https://doi.org/10.1007/s11145-022-10393-0

Gordon, L. (2010, April 26). *Teaching letter sounds in preschool, kindergarten, and special education: Five strategies to ease the memory burden*. [Conference paper] International Reading Association Annual Convention, Chicago, Illinois, United States of America. https://files.eric.ed.gov/fulltext/ED535433.pdf

Heilmann, J., Moyle, M. J., & Rueden, A. M. (2018). Using alphabet knowledge to track emergent literacy skills of children in Head Start. *Topics in Early Childhood Special Education*, *38*(2), 118–128. https://doi.org/10.1177/0271121418766636

Huang, F. L., Tortorelli, L. S., & Invernizzi, M. A. (2014). An investigation of factors associated with letter-sound knowledge at kindergarten entry. *Early Childhood Research Quarterly*, *29*(2), 182–192. https://doi.org/10.1016/j.ecresq.2014.02.001

International Literacy Association. (2019). *Phonological awareness in early childhood literacy development*. https://www.literacyworldwide.org/docs/default-source/where-we-stand/ila-phonological-awareness-early-childhood-literacy-development.pdf

Jenner, K. (2021). *Alphabet knowledge and handwriting*. https://www.in.gov/doe/files/12-alphabet-knowledge-and-handwriting.pdf

Kang, E. Y., & Shin, M. (2019). The contributions of reading fluency and decoding to reading comprehension for struggling readers in the fourth grade. *Reading & Writing Quarterly, 35*(3), 179–192. https://doi.org/10.1080/10573569.2018.1521758

Kuppen, S. E. A., & Bourke, E. (2017). Rhythmic rhymes for boosting phonological awareness in socially disadvantaged children. *Mind, Brain, and Education*, *11*(4), 181–189. https://doi.org/10.1111/mbe.12148

Lee, J. A. C., & Al Otaiba, S. (2015). Socioeconomic and gender group differences in early literacy skills: A multiple-group confirmatory factor analysis approach. *Educational Research and Evaluation: An International Journal on Theory and Practice, 21*(1), 40–59. https://doi.org/10.1080/13803611.2015.1010545

Lee, J. A. C., & Al Otaiba, S. (2017). End-of-kindergarten spelling outcomes: How can spelling error analysis data inform beginning reading instruction? *Reading and Writing Quarterly: Overcoming Learning Difficulties*. *33*(3), 226–238. https://doi.org/10.1080/10573569.2016.1165639.

Lee, W. L., Low, H. M., & Mohamed, A. R. (2012). Word count analysis of Malay language textbooks for the purpose of developing a Malay reading remedial programme. *Writing System Research, 4*(1), 103–119. https://doi.org/10.1080/17586801.2012.690713

Li, S., & Woore, R. (2021). The effects of phonics instruction on L2 phonological decoding and vocabulary learning: An experimental study on Chinese EFL learners. *System, 103*, 102677. https://doi.org/10.1016/j.system.2021.102677

McKinnon, D. (2017). Early years instruction. *BU Journal of Graduate Studies in Education, 9*(1), 32–37. https://eric.ed.gov/?id=EJ1230416

Milankov, V., Golubovic, S., Krstic, T., & Golubovic, S. (2021). Phonological awareness as the foundation of reading acquisition in students reading in transparent orthography. *International Journal of Environmental Research and Public Health, 18*(10). https://doi.org/10.3390%2Fijerph18105440

Miller, R. T. (2019). English orthography and reading. In J. I. Liontas (Eds.), *The TESOL encyclopedia of english language teaching* (pp.1–7). John Wiley & Sons. https://doi.org/10.1002/9781118784235.eelt0461

Ministry of Education Malaysia. (2013). *Malaysian education blueprint 2013-2025.* https://www.moe.gov.my/menumedia/media-cetak/penerbitan/dasar/1207-malaysia-education-blueprint-2013-2025/file

Ministry of Education Malaysia. (2015). *English language education reform in Malaysia: The roadmap 2015-2025.* http://eltc.moe.edu.my/roadmap/The%20Roadmap%202015-2025.pdf

Munoz-Najar, A., Gilberto, A., Hasan, A., Azevedo, J. P., & Akmal, M. (2021). *Remote learning during Covid-19: Lessons from today, principles for tomorrow.* The World Bank. https://documents1.worldbank.org/curated/en/160271637074230077/pdf/Remote-Learning-During-COVID-19-Lessons-from-Today-Principles-for-Tomorrow.pdf

National Early Literacy Panel. (2008). *Developing early literacy: Report of the National Early Literacy Panel*. https://lincs.ed.gov/publications/pdf/NELPReport09.pdf

Norahim, N. (2019). Preliminary review of research on languages and dialects of Sarawak. In *Kepelbagain bahasa di Borneo* [*Language Diversity in Borneo*] (pp. 286–300). Dewan Bahasa dan Pustaka, Brunei.

Organization for Economic Cooperation and Development (OECD) (2023, December 5). *PISA 2022 results (volume I and II): country notes – Malaysia.* https://www.oecd.org/en/publications/pisa-2022-results-volume-i-and-ii-country-notes_ed6fbcc5-en/malaysia_1dbe2061-en.html

Park, S., & Piasta, S. B. (2023). Are there developmental patterns in emergent bilingual children's English letter-name knowledge? *International Journal of Bilingual Education and Bilingualism, 27*(2), 159–172. https://doi.org/10.1080/13670050.2023.2208708

Phillips, J. A. (2021, June 26). Supporting PdPR learners with poor, no internet connection. *NST Online.* https://www.nst.com.my/opinion/columnists/2021/06/702530/supporting-pdpr-learners-pMoor-no-internet-connection

Piasta, S. B., Logan, J. A. R., Farley, K. S., Strang, T. M., & Justice, L. M. (2021). Profiles and predictors of children's growth in alphabet knowledge. *Journal of Education for Students Placed at Risk, 27*(1), 1–26. https://doi.org/10.1080/10824669.2021.1871617

Piasta, S. B., Park, S., Fitzgerald, L. R., & Libnoch, H. A. (2022). Young children's alphabet learning as a function of instruction and letter difficulty. *Learning and Individual Differences, 93*, 102113. https://doi.org/10.1016/j.lindif.2021.102113

Piasta, S. B., & Wagner, R. K. (2010). Developing early literacy skills: A meta-analysis of alphabet learning and instruction. *Reading Research Quarterly, 45*(1), 8–38. https://doi.org/10.1598/RRQ.45.1.2

Salleh, M. A. T. R., Lotfie, M. M., Zamin, M. A. A., Biase, B. D., & Kawaguchi, S. (2020). Towards a new framework of English language learning in Malaysian preschools. *Southeast Asia Early Childhood Journal, 9*(2), 144–154. https://files.eric.ed.gov/fulltext/EJ1288819.pdf

Samuddin, M., K., & Krish, P. (2018). English orthographic depth among Malay learners at a Primary School. *3L: Language, Linguistics, Literature® the Southeast Asian Journal of English Language Studies*, *24*(1). https://doi.org/10.17576/3L-2018-2401-05

Share, D. L. (2004). Knowing letter names and learning letter sounds: A causal connection. *Journal of Experimental Child Psychology, 88*(3), 213–233. https://doi.org/10.1016/j.jecp.2004.03.005

Sultana, F., Bari, R., & Munir, S. (2022). Impact of school closures due to COVID-19 on education in low and middle-income countries. *Journal of Global Health Reports*, *6*, 2–4. https://doi.org/10.29392/001c.36902

Townsend, M., & Konold, T. R. (2010). Measuring early literacy skills: A latent variable investigation of the phonological awareness literacy screening for preschool. *Journal of Psychoeducational Assessment, 28*(2), 115–128. https://doi.org/10.1177/0734282909336277

Treiman, R., & Kessler, B. (2003). The role of letter names in the acquisition of literacy. *Advances in Child Development and Behavior, 31,* 105–135.

UNICEF. (2020). *Understanding the impact of COVID-19 on vulnerable children and families in Malaysia.* https://www.unicef.org/malaysia/media/1916/file/Impact%20of%20COVID-19%20on%20Vulnerable%20Children%20&%20Families%20in%20Malaysia.pdf

UNICEF. (2021). *Learning losses from COVID-19 could cost this generation of students close to $17 trillion in lifetime earnings.* https://www.unicef.org/press-releases/learning-losses-covid-19-could-cost-generation-students-close-17-trillion-lifetime

Vazeux, M., Doignon-Camus, N., Bosse, M. L., Mahé, G., Guo, T., & Zagar, D. (2020). Syllable-first rather than letter-first to improve phonemic awareness. *Scientific Reports, 10*(1). https://doi.org/10.1038/s41598-020-79240-y

World Bank. (2024). *Bending bamboo shoots: Strengthening foundational skills*. https://www.worldbank.org/en/country/malaysia/publication/bending-bamboo-shoots-strengthening-foundational-skills