



Ignatius Ajuru University of Education, Port Harcourt, Nigeria

Research and Development Centre

1st International Conference and Exhibition on Research, Innovation and Development (ICERID 2026)

Proceedings URL: <https://iauejournals.com/index.php/ICERID>

Website: <https://icerid.online>



ISBN: 978-978-63205-1-9

June 2026; Page No. 405-414

Teacher–AI Collaboration and Early Literacy Skills Acquisition of Preschool Children in Public Early Childhood Education Centres in Abia State

*Nwachukwu, C., & Ekpo, I. E.

Department of Early Childhood and Primary Education, Ignatius Ajuru University of Education, Port Harcourt, Nigeria.

*Corresponding author email: chidinma.nwachukwu@iaue.edu.ng

Abstract

The problem of this study is that public preschools in Abia State continue to rely on traditional teaching methods, with limited use of modern instructional tools such as individualised reading instruction, practice partners, and differentiated AI-supported approaches. Consequently, there is little empirical evidence on how these methods influence preschool children's phonological awareness and understanding of print. For these reasons, this study examined Teacher–AI Collaboration and Early Literacy Skills Acquisition among preschool children in public Early Childhood Education Centres in Abia State, Nigeria. The study focused on two dimensions of Teacher–AI Collaboration and its effect on phonological awareness and print concepts skills of preschoolers, respectively. A quasi-experimental pretest–posttest control group design was adopted for the study. The population comprised approximately 4,862 preschool children distributed across 312 registered public Early Childhood Education Centres in the state. While a sample of 120 preschool children was selected using multistage sampling techniques. Data were collected using the Early Literacy Skills Acquisition Assessment (ELSAA). The instrument was validated by experts in Early Childhood Education and Measurement and Evaluation, while a reliability coefficient of 0.82 was obtained using Cronbach's alpha statistics. Data collected were analysed using mean, standard deviation, and Analysis of Covariance (ANCOVA). The findings revealed that preschool children exposed to Teacher–AI Collaboration improved significantly in phonological awareness, with a mean gain of 4.29 compared to the control group with a mean gain of 1.07. Similarly, Teacher–AI Collaboration significantly enhanced print concepts with a mean gain of 4.11 compared to the control group with a mean gain of 0.97. Furthermore, Teacher–AI Collaboration significantly improved print concepts with a mean gain of 4.17 compared to the control group with a mean gain of 1.04. ANCOVA results further confirmed that all the interventions had statistically significant effects with large effect sizes. The study concluded that Teacher–AI Collaboration significantly enhances early literacy skills acquisition among preschool children. It was recommended, among others, that AI-supported instructional technologies should be integrated into public early childhood education centres to improve literacy learning outcomes.

Keywords: Teacher–AI Collaboration, Early Literacy Skills Acquisition, Content Creation with Differentiation, Practice Partner, Phonological Awareness

Introduction

In this age of digital activities, early literacy among preschool-aged children is an essential component. AI is not just something that exists outside of the educational environment; it's a part of the work that is essential to the educational institution. Together with educational activities carried out by the carers, preschool children's knowledge of artificial intelligence will be solidified, and digital learning will be used in our educational system. The study of Teacher–AI

partnership and acquisition of reading skills for preschoolers in public early childhood education centres in Abia State is very important because preschoolers have to be knowledgeable about what is happening in society as a result of the study.

Preschool is a critical period in the development of a child due to rapid brain, language, emotional, and social changes. With the assistance of their carers and the use of artificial intelligence, preschoolers build the core reading abilities that will impact their school success and ability to learn throughout their lives. The acquisition of early literacy skills is the foundation for reading and writing competence in later years, and the development of these skills will include the acquisition of the ability to listen to, read, and remember words, and to comprehend the alphabet. UNICEF (2023) reports that children who have developed good reading and writing skills in the early grades are more likely to do well in the later grades.

One of the critical educational problems in many developing countries, such as Nigeria, is the achievement of reading in preschool children. Pupil/teacher ratios are high, teachers in public ECE centres are under-prepared, have limited access to technology, overuse successful teaching strategies, and have to accommodate unqualified carers. These restrictions reduce opportunities for youngsters to get the individual tailored instruction and activities that are essential for their literacy learning (Federal Ministry of Education, 2022). Due to its numerous beneficial features, AI is infiltrating classrooms as a method to help and resolve education issues, especially those concerning teaching and learning at a young age, such as in preschool settings. Artificial Intelligence (AI) is an area of computer science that works to develop computer programs that mimic human intelligence activities for the purpose of performing specific tasks. These are the following responsibilities: Reasoning, Pattern recognition, Decision making, Language comprehension, Environmental perception, Learning from experience. A key part of AI is the capacity to learn from past experiences, analyse the data in new ways, and complete tasks autonomously to achieve specific objectives. When put into practice, AI is more of a suite of techniques than a standalone technology. It can be valuable for professionals, as it can scale decision-making, augment human expertise and uncover patterns and insights from data that might otherwise only be deciphered manually.

The seamless integration of AI into the educational landscape is reshaping instructional methods, engagement, evaluation practices, and management at every level across education. In the early childhood education (ECE) field, there has been considerable excitement about instructional systems with artificial intelligence (AI) and how they can be employed to support young children's learning in classrooms where technology is an integral part of the design. It's been all over the news in the early childhood education (ECE) world about instructional systems with AI, and how teachers can make use of them to facilitate young children's learning in a technologically designed classroom. These systems can provide engaging and personalised learning for every child, effectively facilitating preschool children to develop digital literacy.

A potential solution to these educational restrictions in ECE and other levels of education is the new phenomenon of teacher-AI collaboration. "Teacher-AI Collaboration" does not focus on replacing teachers, but on using AI tools and tools to enhance classroom teaching, student learning, and evaluations. AI systems can serve as supportive instructional partners on a variety of fronts, including smart tutoring, adaptive content generation, learner progress monitoring, and instructional experience design (Luckin & Cukurova, 2024). The teachers from the field of early childhood education can capitalise on their professional pedagogical knowledge and combine it with adaptive technologies based on AI to create age- and skill-appropriate literacy learning environments. In this context, teachers can design lessons tailored to individual students' needs, monitor students' progress in real-time, and provide students with feedback that they can see immediately and practice with (Kucirkova & Flewitt, 2023).

The main principles of this study's conceptualisation of the AI-teacher collaboration are content production and differentiation, and tutoring with a practice partner. Content creation with differentiation involves collaboration between teachers and AI tools to develop personalised and differentiated literacy lessons across students' interests, talents and developmental levels. Differentiated instruction (DI) is based on the conceptual differences among students, including how they learn, their readiness, and the speed at which they learn, as well as their cognitive ability (Tomlinson, 2021). This therefore implies that each pupil becomes a unique individual whose strengths, weaknesses, readiness and talents are considered.

Literacy activities such as digital storytelling, phonics exercises, picture-word connections, pronunciation exercises, and interactive reading tasks can be created by teachers with the help of AI-supported differentiated content creation. AI systems can adjust the difficulty, pace, and feedback methods for instruction based on the reactions of learners, how well they understand their material, and what their learning needs are.

Teachers need to employ a wide range of content in their teaching when working with preschoolers, as they are not all exposed to the same language, cognitively ready, or at the same reading readiness level. Preschoolers' interest in reading and readiness to read are both enhanced by AI-supported differentiated education, according to the research.

Books, songs, and games that explore letter sounds, syllables, and print are essential for preschoolers. The teacher could give the AI the directive "Create 5 rhyming games for 4-year-olds about animals," and the AI will do so. AI generates three versions: one using simple 2-syllable words, another alliterating words and a third using a visual. This is only for those who are not readers. The teacher then assigns each student their own copy, adding in props and actions. They will learn early literacy skills such as humming along with rhymes, knowing that words and letters do have meaning, and moving left to right, in doing so. Simply put, AI can do the tracking, generating and repeating of data that preschool teachers simply don't have the time for. The teacher's role in building relationships, modelling language, and knowing what is developmentally appropriate for the preschooler's learning continues.

A second topic of collaboration between teachers and AI is practice partner tutoring. These systems have the ability to allow preschoolers to practice reading and writing by providing interactive activities, feedback mechanisms, and intelligent learning support, all supervised by a teacher. It is beneficial for preschoolers to have a practice partner to work with as they learn to read and write. Adaptive instructional support, intelligent feedback, reinforcement, and guided literacy practice are all provided by these systems. Using activities like interactive storytelling, word-building, sound-identification, and pronunciation drills, AI tutoring systems help youngsters develop their reading skills. Such methods support the iterative process of practice, self-directed inquiry, and continuous reinforcement in the process of achieving reading competence.

One of the advantages of AI teaching systems is that they provide immediate feedback for improvement, unlike human teachers, who may not be available immediately. Feedback has been found to facilitate students' understanding of the literacy topics and prevent the development of misconceptions during learning (Chen & Hwang, 2024). Furthermore, gamification, animation, prizes, and interactive interfaces motivate students to learn with the help of AI teaching systems. By boosting engagement and enabling personalised learning experiences, empirical research reveals that AI tutoring systems considerably enhance early literacy acquisition. Luckin and Cukurova (2024) found that intelligent tutoring systems offer an adaptive practice environment favourable for improving youngsters' reading fluency and phonemic awareness.

Preschoolers should receive letter and sound practice in a safe setting for tutoring programs. The technology of AI can be used to replicate a one-on-one companion for children under care. The gadget can play games based on the child's voice, for example, "Find the letter that makes /m/ sound", and give instant feedback and new exercises when the child has learned a letter. It will keep saying "A says /a/". For example, if a teacher were to fix an AI sound and then have the child repeat it after it, the youngster would eventually learn that the letter "A" sounds /a/. With activities such as sound, playdough, etc. teacher alters the scope to prevent AI from skipping forward, monitoring for frustration or intervening. They will build basic reading skills such as letter recognition, phonemic awareness, early decoding and letter-sound correspondence. Phonological awareness and print concepts were the foci of this study's attention in relation to the acquisition of literacy abilities. These two types of literacy are crucial for preschoolers because they are two of the fundamental skills that they must acquire before starting their formal education.

The development of skills related to phonological awareness and print concepts is crucial for preschoolers in their future learning of the English language because the skills they acquire now will facilitate them when learning to read, write, speak, and listen. Being phonologically aware is being able to identify and work with many building blocks of speech sounds. In other words, it's a talent for hearing that is based on sound rather than sight. Another term for the metalinguistic ability infants has to hear, identify, and manipulate the sound patterns of spoken language beyond letters of the alphabet is phonological awareness. This includes identifying syllables, rhymes and alliteration in words, onset and rime patterns and specific phonemes (Gillon, 2023). Phonological awareness is one of the most important literacy

skills for children to develop because it makes it much clearer to them that words are composed of smaller sound units which can be segmented, combined, transformed, and scrambled when they practice reading and practising their language skills.

As learners' phonological awareness increases, they become able to recognise sound patterns that are larger in size and smaller, more complex, in size in terms of phonemes. Youngsters are first sensitive to the syllables and rhymes in words before they develop phonemic awareness. The ability to recognise and manipulate individual sounds in words is called Phonological awareness. Phonemic awareness is an essential component of reading fluency, spelling and decoding (Lonigan et al., 2022). Studies on the topic of early childhood education have indicated that high children's phonological awareness is strongly related to their reading proficiency and achievement in later grades. Children with good phonological awareness skills have a greater chance of becoming successful readers (Ehri, 2023). Conversely, poor decoding skills as well as academic difficulties are tightly linked to a lack of phonological awareness. On the other hand, reading problems, poor decoding skills and related academic problems are all closely connected to deficiencies in phonological awareness.

In recent years, there have been increasing studies on the relationship between phonological awareness and reading fluency and comprehension skills, resulting in a stronger representation of phonological awareness in contemporary literacy programs. The ability to decipher new words, identify correlations between sounds and letters, and build automatic word recognition abilities are all greatly aided by phonological awareness, says the National Early Literacy Panel (2023). Children who can identify good starting points, blend sounds, divide syllables and play with sound patterns are more confident and ready to read. New reading tools that incorporate artificial intelligence have greatly improved the way phonological awareness is taught to young children. Kucirkova and Flewitt (2023) state that preschoolers can practice their phonological skills in various, fun and interactive ways with the use of literacy apps such as speech recognition, sound matching activities, digital storytelling and pronunciation feedback systems. The best part of phonics apps with AI is that they can support children at various developmental levels to provide individual sound practice and immediate feedback when children make a mistake.

From a theoretical standpoint, phonological awareness is in line with emergent literacy theory (Whitehurst & Lonigan, 2022). This theory suggests that exposure to language-rich environments is a source of children's language input before they start formal reading instruction and extends beyond it to children's literacy development. It is therefore very important for preschools to offer activities to support children's phonological processing skills, including singing, rhyming, and playing rhyming games to test the child's ability to discriminate sounds. Children's print conceptions, including their knowledge about the structure, function, rules and arrangement of written language, also play a role in their ability to read and write well. The first step is to be aware that written language has a definite structure and it is meaningful. Because they lay the groundwork for later formal reading development, print concepts are critical to children's emerging literacy.

Reading and writing cover a lot of ground, that it can identify books and printed material, letters and words, and can differentiate between text and pictures, and recognise that print is upside down and right side up. This includes the understanding that the written language can be used to represent oral language (Piasta & Wagner, 2023). Preschool learning environments should provide children with ample opportunities to access books, labels, charts, posters, digital texts, and environmental print materials to teach and learn the two types of literacy skills mentioned above. This can be achieved through the work of teachers and AI. Though the education sector globally has embraced the use of AI, there is limited empirical evidence on the effectiveness of Teacher-AI Collaboration in Nigerian Public Early Childhood Education Centres. Most of the public preschools in Abia State continue to employ outdated pedagogical practices, with limited or even no use of 'tricky' pedagogical tools. Thus, the isolated programs of individualised reading instruction may not be adequate to benefit preschool children in terms of their phonological awareness and understanding of print.

Also, there is a severe lack of research and data from studies examining the effect of teacher-AI collaboration and the development of early reading skills in Nigerian classrooms, especially for preschoolers. Compared to other age groups, there is a lack of literature on AI for literacy development in preschool because most studies have focused on the integration of AI in secondary and higher education. Therefore, there is a scarcity of information about the impact of

using practice partners and differentiated artificial intelligence on the phonological awareness and print concepts of preschoolers in Abia State and the benefits they could derive from such tutoring systems.

All this may be explained by the lack of sufficient teaching materials, absence of personalised teaching, and the continued use of the traditional teacher-centered pedagogy. There exists a very limited implementation of the use of AI-supported teaching approaches in Public Pre-School Programs in Abia State, Nigeria, and it has been shown to boost literacy acquisition globally. In view of this background, this study sought to examine the effect of teacher-AI collaboration on early literacy skills of preschool children in publicly funded ECE centres in Abia State. Teacher-AI collaboration in literacy instruction and learning could be a solution to the problem of poor literacy acquisition in the public early childhood education centres of Abia State.

Aim and Objectives of the Study

The aim of this study was to examine Teacher–AI Collaboration and Early Literacy Skills Acquisition among preschool children in public Early Childhood Education Centres in Abia State, Nigeria. The specific objectives of the study were to:

1. Determine the effect of Teacher–AI Collaboration on phonological awareness among preschool children in public Early Childhood Education Centres in Abia State.
2. Ascertain the extent to which Teacher–AI Collaboration influences print concepts among preschool children in public Early Childhood Education Centres in Abia State.

The following research questions guided the study:

1. What effect does Teacher–AI Collaboration have on phonological awareness among preschool children in public Early Childhood Education Centres in Abia State?
2. To what extent does Teacher–AI Collaboration influence print concepts among preschool children in public Early Childhood Education Centres in Abia State?

The following null hypotheses were formulated and tested at 0.05 level of significance:

H01: Teacher–AI Collaboration has no significant effect on phonological awareness among preschool children in public Early Childhood Education Centres in Abia State.

H02: Teacher–AI Collaboration has no significant effect on print concepts among preschool children in public Early Childhood Education Centres in Abia State.

Methodology

A quasi-experimental approach with a pretest and posttest control group design was used to examine the effects of the Teacher-AI Collaboration on early literacy skills development in preschoolers. This design was deemed suitable since it allows for the comparison of treatment effects while maintaining the children's natural school environment. Abia State, Nigeria, was the site of the research. There are seventeen LGAs and a publicly funded ECE centre system in the state. According to the records of Abia State Universal Basic Education Board (ASUBEB, 2024), 4,862 children from 312 registered public Early Childhood Education centres participated in the 2024/2025 academic session of the study, making them the population of the study.

A representative sample of 120 preschool-aged children was selected by a multi-stage selection process. To begin, three LGAs in the city and three in the countryside were picked at random from the whole state. Secondly, from all the sites that were considered, one school was selected at random. The research included the following educational institutions: City Primary School in Umuahia North LGA; Urban Primary School in Umuahia North LGA; School Road Primary School in Umuahia North LGA; Ossah Central School in Umuahia North LGA; Aba Road Primary School in Umuahia South LGA; Amachara Central School in Umuahia South LGA; Town School in Aba South LGA; Constitution Crescent Primary School in Aba South LGA; Abayi Central School in Aba North LGA; and Osisioma Central School in Osisioma Ngwa LGA. The chosen centres' intact preschool classrooms were randomly divided into two groups: one for the experimental group and another for the control. There were 60 children in each group. Consequently, there was less disruption of normal school operations and better maintenance of the natural classroom.

Twenty items, depending on performance, made up the Early Literacy Skills Acquisition Assessment (ELSAA), an instrument created by researchers. The items in questions 11-20 measured print concepts, and those in 1-10 measured phonological awareness. The pre and post-test scores were obtained in both the control and experimental groups. A score of 2 was considered to be a completely right answer, 1 partially right, and 0 completely wrong or no answer. The instrument was vetted by a panel of professionals in the field of Early Childhood and Primary Education and in the field of Measurement and Evaluation through face-to-face interactions. Based on Cronbach's alpha coefficients of 0.81 for phonological awareness, 0.79 for print concepts, and 0.82 overall, the reliability of the instrument was confirmed in a pilot study that was conducted outside of the study area. With the help of three qualified research assistants, the researchers directly administered the instrument to guarantee consistency and adherence to ethical standards. Research assistants were trained in administration, scoring, classroom management and ethical issues before the beginning of this project. Before data collection, we ensured we had the permission of the school administration and parents.

Preschoolers' early reading abilities were the target of an eight-week intervention that included a teacher-AI collaboration literacy program. Diffit and LitLab.ai were the AI technologies utilised in the research. Using Diffit, the levelled texts, vocabulary lists, rhyming activities, picture-word matching tasks, scaffolded phonological awareness activities and differentiated literacy materials were all created to address the children's individual developmental needs. Tutoring and practice were provided by LitLab.ai, which included decodable books, guided reading, tasks using the alphabet and print concepts, instant feedback, and opportunities for repeated literacy practice. The use of these technologies was mediated by teachers; youngsters were active, and each youngster was helped individually.

As part of the intervention, educators worked with AI tools to create a variety of phonics and reading activities, including games that encourage rhyming, exercises that focus on sound identification, digital storytelling challenges, games that encourage picture-word matching, games that focus on letter recognition, and exercises that promote print awareness. The tutoring software also functioned as a practice partner by providing an adaptive approach and support, interactive reading experiences, guided literacy activities and repeated sounds and letters. The activities were aimed at developing youngsters' phonological skills and print concepts. These were implemented with the guidance of instructors, involvement of youngsters, individualisation of practice and persistent scaffolding. Conversely, the control group did not participate in the organised Teacher-AI Collaboration programme and instead received traditional literacy teaching focused on the teacher. The data analysis used in this study was the standard deviation and mean to meet the study objectives. Analysis of Covariance (ANCOVA) was used to test the hypotheses at a 0.05 level of significance. The ANCOVA was an appropriate method of analysis because it enabled the comparison of post-test scores between groups, with pre-test scores as the covariate. We used SPSS Version 27 for all of our analyses.

Results

Table 1: Mean and Standard Deviation Analysis on the Effect of Teacher–AI Collaboration on Phonological Awareness among Preschool Children.

Group	Pretest	Posttest
Control Group (Mean	6.03	7.10
Std. Deviation	0.31	0.42
N	60	60
Experimental Group(Mean)	6.95	11.24
Std. Deviation	0.52	0.48
N	60	60

Source: Field Survey and SPSS Output, 2025.

With an increase of 4.29 points from their pretest score of 6.95 to their posttest score of 11.24, the experimental group that was subjected to Teacher–AI Collaboration showed a significant improvement in phonological awareness,

according to the results shown above. On the other hand, the control group that was taught using traditional methods only had a small improvement, going from an average score of 6.03 to 7.10, or a gain of 1.07. The results indicated that Teacher–AI Collaboration significantly increased preschoolers' phonological awareness. The AI-assisted differentiated literacy content generation by design seems to have enhanced the ability of children to recognise, discriminate, and manipulate speech sounds more than traditional teaching methods, as evidenced by the experimental group's significantly higher mean score for the posttest.

Table 2: Mean and Standard Deviation Analysis on the Effect of Teacher–AI Collaboration on Print Concepts among Preschool Children

Group	Pretest	Posttest
Control Group (Mean)	5.11	6.08
Std. Deviation	0.28	0.35
N	60	60
Experimental Group (Mean)	5.92	10.03
Std. Deviation	0.46	0.57
N	60	60

Source: Field Survey, 2025.

The mean gain for the experimental preschoolers in the print concept pretest and posttest is +4.11 points, which indicates that the experimental group significantly increased their scores from a mean pretest score of 5.92 points to a mean posttest score of 10.03 points. In contrast, there was a small improvement (a mean gain of 0.97 points) in the control group's performance, going from 5.11 to 6.08. The Knowledge of print structures, Book handling skills, direction of print and knowledge of the textual features were all significantly enhanced following training by the Practice partner. The posttest results indicate that the experimental group students achieved a greater amount of knowledge about reading and writing with the assistance of the Practice partners than they did using more traditional teaching methods.

Table 3: ANCOVA Analysis on the Effect of Teacher–AI Collaboration on Phonological Awareness

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	248.416a	2	124.208	1642.315	.000	.984
Intercept	6.102	1	6.102	80.681	.000	.592
Pretest Scores	4.015	1	4.015	53.086	.000	.476
Group	74.321	1	74.321	983.504	.000	.948
Error	5.301	117	.076			
Total	6180.000	120				
Corrected Total	253.717	119				

a. R Squared = .984 (Adjusted R Squared = .983)

According to the ANCOVA data shown above, there was a statistically significant impact of Teacher–AI Collaboration on the phonological awareness of preschoolers ($F(1,117) = 983.504$, $p = .000$, $\eta^2 = .948$). The results of this study reject the null hypothesis, as the p-value is 0.000, which is less than the significance level of 0.05. After adjusting for pretest scores, this suggests that preschoolers' phonological awareness was much enhanced by content creation with differentiation. Furthermore, the intervention contributed greatly to the preschoolers' improvement in phonological awareness in terms of the large effect size (Partial Eta Squared = .948).

Table 4: ANCOVA Analysis on the Effect of Teacher–AI Collaboration on Print Concepts
Dependent Variable: Posttest Print Concepts Scores

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	241.304a	2	120.652	1768.416	.000	.986
Intercept	1.842	1	1.842	27.003	.000	.319
Pretest Scores	6.404	1	6.404	93.894	.000	.624
Group	45.211	1	45.211	662.994	.000	.923
Error	3.982	117	.068			
Total	4876.000	120				
Corrected Total	245.286	119				

a. R Squared = .986 (Adjusted R Squared = .985)

The findings of the analysis of covariance (ANCOVA) showed that preschoolers' print conceptions were significantly affected by Teacher–AI Collaboration ($F(1,117) = 662.994, p = .000, \eta^2 = .923$). This null hypothesis was declared as being rejected because the significance value (.000) is less than the set alpha level (0.05). This indicates that children in the preschool age group had a substantial level of improvement in their understanding of print concepts as a result of a coach/partner. The large effect size (Partial Eta Squared = .923) indicated that the intervention had a significant impact on children's print awareness and understanding of written language structures during the preschool years.

Discussion

Teacher–AI Collaboration and Phonological Awareness

The study revealed that Teacher–AI Collaboration had a significant impact on preschoolers' phonological awareness in public ECEC in Abia State. The differentiated approach to literacy was supplemented with AI, and the experimental group had a significantly larger average gain (from 6.95 to 11.24) than the control group (6.03 to 7.10). The statistical significance of this effect was further validated by the ANCOVA result ($F(1,117) = 983.504, p < 0.05, \eta^2 = .948$). This indicates that preschoolers' ability to identify, differentiate and manipulate the spoken language sounds was significantly enhanced by the AI-supported differentiated instructional content. Perhaps, in part, because of the individualised and flexible nature of the literacy exercises, students in the experimental group showed great improvement. Children have many opportunities to develop their phonemic awareness skills in these activities: phonics, digital storytelling, and interactive sound. Further, the findings suggest that using a diverse range of teaching styles, supported by AI technologies, fosters children's interest in and motivation towards literacy instruction, and encourages active engagement. Perhaps children's understanding of phonemic structure, rhymes, syllables, and sound patterns was enhanced by the ability of AI systems to adjust the content of literacy to the level of their development compared to traditional instruction methods. This confirms the results of previous studies and demonstrates that reading education through AI is significantly improving the phonological awareness of preschoolers through differentiated education. Adaptive digital literacy apps enhance kids' phonemic processing skills via individualised and interactive learning experiences, according to research by Kucirkova and Flewitt (2023) and Chen and Hwang (2024). In the same way, research on the development of emerging literacy has pointed to the importance of frequent access to phonological literacy activities to improve young learners' reading readiness and phonological awareness.

Tutoring with Practice Partner and Print Concepts The study found that tutoring with Practice Partner was beneficial to children attending public Early Childhood Education Centres in Abia State for preschool-aged children. The mean scores of the control group increased from 5.11 to 6.08, while the experimental group scores jumped from 5.92 to 10.03. The effect was further confirmed as statistically significant by the ANCOVA result ($F(1,117) = 662.994, p < 0.05, \eta^2 = .923$).

The results indicated that preschool children taught using Teacher–AI Collaboration had more of an understanding of the structure, roles, and norms of written language. The use of guided literacy activities, visual literacy materials, reading animation apps, and engaging digital texts likely helped children to develop a deeper understanding of the conventions of print directionality, book handling, word identification and text structures. Based on the results of this

study, it can be concluded that preschool children can benefit from tutoring practice partners in providing meaningful and age-appropriate opportunities to engage with the written language. AI-enabled teaching systems may have provided children with more literacy-enriched environments that could have supported their print awareness and early reading skills. This confirms what other research has shown: that interactive digital literacy tools that are interactive greatly enhance preschoolers' print awareness and emerging reading abilities. Through visual-textual engagement and interactive reading experiences, literacy technologies boosted by AI help children comprehend print structures (Neumann and Neumann, 2024). Children's understanding of print norms and reading actions is significantly increased when children have access to literacy-rich environments and engage in guided reading activities, according to Justice and Ezell (2022). In addition, the results provide credence to emergent literacy theory, which states that children gain basic literacy skills via purposeful engagement with print materials and contexts rich in language. The print topics investigated by youngsters through the AI-supported tutoring with a practice partner instructional activities were likely to be more active and frequent, thus enhancing their literacy learning.

Conclusion

The collaboration between teachers and AI proved to be a tremendous asset for preschoolers attending public ECE centres in terms of early reading and writing abilities in Abia State. Research indicated that the preschoolers' phonological awareness and their Print Concepts had both significantly improved following the use of Teacher–AI Collaboration. Preschoolers' core literacy competencies can be enhanced through the use of AI-supported instructional strategies, according to the study. Such strategies provide adaptive, interactive, engaging and learner-centred literacy experiences. The results underscore the importance of integrating AI technologies into preschoolers' literacy education to boost learning outcomes in innovative ways. Thus, the teaching methods of Teacher-AI Collaboration are a promising way of education that can help children to improve their early reading skills and prepare themselves for their academic success in schools.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. It is noteworthy that the government and educators in Abia State should support the implementation of Teacher-AI Collaboration in the public Early Childhood Education Centres. This can be done by providing these centers with AI enabled instructional technologies including Tablets, interactive literacy software, digital story application, intelligent tutor systems that can generate content with differentiations and digital story applications.
2. In order to help preschoolers develop phonological awareness and print concepts, school administrators and teachers should incorporate AI-supported intelligent tutoring systems into literacy lessons. Practice partners, as well as the skills to effectively use AI to create content with the ability to differentiate, should be a part of these systems.

References

- Abia State Universal Basic Education Board. (2024). *Abia State Universal Basic Education Board*.
- Chen, Y., & Hwang, G. J. (2024). Artificial intelligence-supported literacy learning among preschool children. *Computers & Education*, 209, Article 104951.
- Ehri, L. C. (2023). The science of word reading and alphabetic knowledge development. *Journal of Literacy Research*, 55(1), 5–27.
- Federal Ministry of Education. (2022). *National policy on early childhood education in Nigeria*. Federal Ministry of Education.
- Gillon, G. T. (2023). *Phonological awareness: From research to practice* (3rd ed.). Guilford Press.
- Justice, L. M., & Ezell, H. K. (2022). *Shared storybook reading and emergent literacy*. Brookes Publishing.
- Kucirkova, N., & Flewitt, R. (2023). Digital technologies and emergent literacy development in early childhood education. *Early Childhood Education Journal*, 51(5), 601–615.
- Lonigan, C. J., et al. (2022). Developing early literacy skills through phonological awareness instruction. *Educational Psychology Review*, 34(3), 1245–1267.
- Luckin, R., & Cukurova, M. (2024). AI-enhanced pedagogy and personalized learning. *British Journal of Educational Technology*, 55(2), 201–219.

- National Early Literacy Panel. (2023). *Developing early literacy: Report of the National Early Literacy Panel*. National Institute for Literacy.
- National Institute for Literacy. (2023). *Foundations of early literacy instruction*. U.S. Department of Education.
- Neumann, M. M., & Neumann, D. L. (2024). Digital literacy technologies and preschool literacy acquisition. *Computers & Education*, 206.
- Piasta, S. B., & Wagner, R. K. (2023). Developing print awareness and literacy competence among preschool children. *Journal of Early Childhood Literacy*, 23(1), 88–109.
- Tomlinson, C. A. (2021). *How to differentiate instruction in academically diverse classrooms* (3rd ed.). ASCD.
- UNICEF. (2023). *Early childhood learning and digital innovation*. UNICEF.
- Whitehurst, G. J., & Lonigan, C. J. (2022). Emergent literacy and early reading development. In *Handbook of early literacy research* (Vol. 4, pp. 11–29).