

THE IMPACT OF AI-SUPPORTED INSTRUCTION ON YOUNG LEARNERS' ENGLISH SPEAKING PERFORMANCE: A QUASI-EXPERIMENTAL STUDY

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Abstract: This study examines the impact of AI-supported instruction on young learners' English speaking performance. Using a quasi-experimental design, 40 primary school learners (aged 7–10) participated in an eight-week intervention comparing AI-assisted speaking activities with traditional classroom instruction. The experimental group used automated pronunciation feedback, conversational AI tools, and gamified speaking tasks, while the control group followed conventional teaching methods. Pre- and post-test assessments measured pronunciation, fluency, vocabulary use, and intelligibility. Results showed significantly greater improvement in the AI group, with large effect sizes, whereas the control group demonstrated only moderate gains. Qualitative observations also indicated increased learner motivation, confidence, and engagement, along with reduced speaking anxiety. The findings suggest that AI tools, when pedagogically integrated, can effectively enhance young learners' oral language development and support classroom instruction.

Key words: Artificial intelligence in education, young learners, English speaking skills, AI-assisted language learning, computer-assisted language learning (CALL), pronunciation and fluency development, primary school EFL, gamified learning, oral language development

Mazkur tadqiqot sun'iy intellekt yordamida tashkil etilgan o'qitishning boshlang'ich sinf o'quvchilarining ingliz tilida gapirish ko'nikmalariga ta'sirini tahlil qiladi. Kvazi-eksperimental dizayn asosida 7–10 yoshdagi 40 nafar o'quvchi sakkiz haftalik tajribada ishtirok etdi va unda AI-ga asoslangan nutqiy mashg'ulotlar an'anaviy ta'lim bilan solishtirildi. Tajriba guruhi talaffuzning avtomatlashtirilgan munosabati, sun'iy intellektga asoslangan suhbat vositalari hamda o'yinlashtirilgan topshiriqlardan foydalandi. Nazorat guruhi esa standart o'qitish usullarida ta'lim oldi. Oldindan va yakuniy baholash natijalari talaffuz, nutq ravonligi, lug'at boyligi va nutq aniqligi bo'yicha tajriba guruhida sezilarli ustunlikni va katta effekt hajmini ko'rsatdi. Shuningdek, sifat tahlili o'quvchilarning motivatsiyasi, faolligi va ishonchi oshganini hamda nutqiy xavotir kamayganini aniqladi. Natijalar sun'iy intellekt vositalarini pedagogik jihatdan samarali integratsiya qilish boshlang'ich ta'limda og'zaki nutq rivojini kuchaytirishini tasdiqladi.

В исследовании анализируется влияние обучения с поддержкой искусственного интеллекта на развитие навыков устной речи на английском языке у младших школьников. В рамках квази-экспериментального дизайна приняли участие 40 учащихся (7–10 лет) в восьминедельном эксперименте, в котором сравнивались ИИ-ориентированные речевые задания и традиционное обучение. Экспериментальная группа использовала автоматизированную обратную связь по произношению, разговорные ИИ-инструменты и игровые устные задания, тогда как контрольная группа обучалась по стандартной методике. До и после тестовые оценки включали показатели произношения, беглости речи, словарного запаса и разборчивости. Результаты показали статистически значимое преимущество экспериментальной группы с большими размерами эффекта, в то время как контрольная группа продемонстрировала умеренный прогресс. Кроме того, качественные данные свидетельствуют о повышении мотивации, вовлеченности и уверенности



учащихся, а также о снижении речевой тревожности. Полученные результаты подтверждают потенциал педагогически интегрированных ИИ-инструментов для повышения эффективности обучения устной речи в начальной школе.

Introduction

Artificial Intelligence (AI) has become increasingly popular in education as a whole and, most notably, language learning. And today, systems like speech recognition, adaptive feedback and natural language processing or other technologies can now help individuals access spoken communication with instant feedback and bespoke replies. Though AI has been investigated widely in adult and adolescent learners, research on children, and in particular on early stages of English learning has been limited. AI's function in enhancing their speaking effectiveness deserves closer attention since young learners are especially attuned to visual, interactive, and repetitive learning.

Commonly cited as one of the hardest steps for children to acquire foreign language knowledge, speaking. At the same time vocabulary as mastering pronunciation and grammar, and communicative intent is maintained by producing speech by way of learning processes. Speech in the classroom of other children often causes children to be hesitant or afraid. With their teachers, they do not always manage to assign all children equal time and also provide them with corrective feedback in real-time. The same restrictions prevent schools from giving every child specific opportunities to improve oral skills.

AI-enabled solutions are well-suited here too, as they offer real-time feedback, infinite chances for repetition, and the ability to mimic conversations without peer group pressures. Speech evaluation systems can increase awareness and identify the mistakes in pronunciation; chatbot-based systems may elicit oral responses; gamified applications can engage interest via rewards and story-guided tasks. Such affordances may provide the individual practice that children don't typically get in physical classrooms.

However, while there might be advantages to this method of teaching, research of AI-aided speaking instruction with young learners remains scarce. The vast majority of the research to date does not offer results for older learners or is merely descriptive. There are relatively few controlled studies that measure increases in children's speaking performance. This study seeks to do that, including examining whether AI-assisted teaching generates better change in oral vocabulary for young children overall when compared with traditional pedagogy.

The research question is:

“To what extent does AI-supported instruction influence young learners' English speaking performance compared to traditional classroom instruction?”

Yet such AI-based tools will not only be better adapted for the development of young learners' spoken language skills, but the use of them in a responsible manner in the primary educational setting will be encouraged and therefore this study adds value in empirically supporting the CALL and early childhood language pedagogies research and learning domains.

Literature Review

2.1. Young Learners and Early English Speaking Development

Children who are learning English at lower primary school level are learning English at a different pace compared to those at upper levels of cognitive and affective development. For those, seeing, moving, and regurgitating are all part of the fun of learning. Their attention span is shorter, and playful and highly interactive activities are highly significant to them (Cameron, 2001; Pinter, 2017). Speaking happens spontaneously, so it is an incredibly taxing task. As well, fears of public speaking, and being wrong, are common, yet these may not be properly catered to in conventional class instruction.



While teacher-led correction is critical at school, as a teacher you will be required to intervene more rarely as limited time and a high number of students are involved. Thus learners may not receive the pronunciation and fluency feedback needed for positive oral growth. Under this reality, interest in technological tools to enhance speaking practice has arisen.

2.2 Speaking as a Multi-Faceted Skill

Spoken communication has many interdependent elements: pronunciation, fluency, vocabulary, and intelligibility, to name a few. Many of the children never model native-like accuracy and prefer to generate understandable language (Goh & Burns, 2012). The best kids take on the role of communicators. The interactionist framework emphasizes practice, feedback, and communication as critical contributors to the development of one's speaking skills (Long, 1996). It is important to have opportunities for children to practice speaking and produce speech in low-pressure scenarios.

But conditions in the classroom typically ignore a class comprised of tones that are more fearful than a little confident. Some may drop out of speaking activities, especially the students who are quieter or anxious. Teachers know of such difficulties but may not have the systems to regularly address them.

2.3. CALL perspectives on oral skills development

The use of computer-aided learning technologies in language learning has evolved from drill-based methodologies to a multidimensional and communicative field in which students can engage in multimodal activities (CALL Perspectives). CALL is effective if the CALL aligns with the pedagogical objectives presented, has clear logic behind it, allows some production opportunities, and feedback is given to students in the rapid response time (Chapelle, 2001). As speech processing devices became more sophisticated, speaking is under-supported, although technology for listening and reading has advanced since then.

Today's CALL environments allow learners to communicate using digital characters, scoring and dialogues, in a more interactive manner. These environments potentially reduce feelings of performance anxiety and make it easier for children to learn.

2.4. AI Applications in Language Learning

AI makes use of machine learning algorithms using natural language processing. AI systems input the content, decode it, get to know how much it is working. Some types of AI tools may aid in oral language learning: "Automated pronunciation evaluation systems are useful for performance evaluation, which can be applied, for example, automatically determining pronunciation accuracy, phoneme recognition, stress detection, and intonation of the sounds (Li & Hu, 2023)." Conversational agents, which are AI-generated agents that engage learners in a conversation. Speaking platforms with gamification, for keeping the motivation levels high using storytelling and other incentives.

AI systems have been shown to support success over pronunciation and fluency improvement by providing more predictable and personalized feedback, and motivating repetition of tasks (Zou et al., 2023; Neri et al., 2008).

2.5. AI for Young Learners — Opportunities and Potential Concerns AI tools have specifically been found to fit the motivational and cognitive profiles of young learners. Children love interactive tasks, animations and game challenges that may make engaging more. AI is free of judgment, as much as that helps to alleviate anxiety about speaking, because children can use it for practice at their own rate.

But there are relevant factors that need to be taken into account:

- Teachers need to have formal training so they can use AI tools effectively



-AI content must be relevant to curriculum goals. -
Data privacy and child concerns must be adhered to as per the child-safety and privacy policy.

Despite these concerns, it can be observed that there have been very few studies in which AI-supported speaking instruction was empirically investigated with controlled designs for primary students.

2.6. Research Gap and Justification

Previous studies have indicated a potential of AI providing a benefit but often limitations such as low design, self-report studies or limited performance-testing for young learners arise. Faced with these obstacles, we put forward a quasi-experimental design, borrowing a validated Speaking Rubric and investigating enhancements in measurable learning for AI assisted and traditional learning in this study.

Methodology

3.1. Summary of design

A quasi-experimental study design with the pre-post design was used to determine if AI-based speaking instruction provided more learning gains than conventional methods. As random allocation of students was difficult due to class scheduling, intact classroom groups were selected as experimental and control groups.

3.2. Setting and Participants

Primary school with English taught twice weekly. Forty learners between 7 and 10 years were enrolled; twenty were assigned to the experimental group and 20 to the control group. They were evenly capable, aged, background and experienced. Learners began as either English novices or intermediate learners and had no previous experience with AI learning tools.

3.3. Instruments

3.3.1. Speaking Rubric

A four-component (40 points total) rubric graded pronunciation, fluency, vocabulary use, and intelligibility. Independent reviewers examined content validity, inter-rater reliability was strong ($\alpha = .87$).

3.3.2. AI Tools

The experimental group used the following:
automated pronunciation feedback system
chatbot
application

An
A conversational AI
gamified speaking

These tools also allowed for repeated practice and personalized feedback.

3.4. Procedures

Pre-test (Week 1)

In Week 1, all learners took a speaking assessment.

Intervention (Weeks 2–7)

Experimental group experienced 20 minutes of AI-based activities per lesson, pronunciation targets, chatbot dialogues, and speaking missions in practice. They also did short communication tasks reinforcing AI-generated content.

Control group did teacher role modeling and repetition, partner conversation practice, classroom correction and feedback.

Post-test (Week 8)

All learners completed the assessment again in Week 8, scored by raters blind to group assignment.

3.5. Data Analysis



Paired-sample “t”-tests were used to analyse gains within groups. Independent-sample “t”-tests were conducted to compare post-test scores between groups. Effect sizes (Cohen’s “d”) determined differences by size. Lessons and teacher logs were analyzed together thematically.

3.6. Ethical considerations

Participation was voluntary by all involved and was subject to the consent of the parent. Learner identities were de-identified, and the AI tool used complied with standards for child protection.

Results

4.1. Descriptive Outcomes

Both groups started with nearly identical pre-test scores (18.4 vs. 18.1). After eight weeks, the experimental group’s mean rose to 27.85, while the control group reached 21.35.

4.2. Within-group Gains

The experimental group showed highly significant improvement ($t(19) = 13.42, p < 0.001, d = 3.00$). The controlled group also improved but to a lesser extent ($t(19) = 4.21, p = 0.002, d = 0.94$).

4.3. Between-group differences

Post-test scores differed markedly between groups ($t(38) = 6.08, p < .001, d = 1.92$), meaning that AI-supported instruction resulted in substantially greater gains.

4.4. Component-Level Insights.

Pronunciation and fluency improved significantly in the experimental group more than any other skill. Vocabulary and intelligibility also strengthened, though less dramatically.

4.5. Qualitative Themes.

Three major themes emerged:

-High engagement: Learners were engaging and showed great enthusiasm in attendance.

Reduced anxiety: AI created an atmosphere for a non-judgmental audience to speak.

Increasing autonomy: Learners independently monitored their own performance.

Discussion and Implications.

The research shows that AI-supported instruction can improve young learners’ speaking skills significantly, as far as they go, from conventional approaches. All of these results are in line with interactionist theories of language, which deal with feedback mechanisms to language. Of course, AI’s instant, customized responses likely helped spur the vast improvements in pronunciation and fluency. This reduction in learner anxiety aligns with what the literature suggests, namely that non-judgmental environments encourage a willingness to communicate (Lin & Chen, 2021). The mechanics of gamification seem particularly potent in sustaining interest and fuelling re-use. Pedagogically, AI tools should work with—not for—teachers. AI is strong at rehearsals and targeted practice, but teachers need to give genuine communication and emotional nourishment. Program designers are likely required to implement an AI experience designed to help to modify academic practice via more structured activities that emphasize speaking skills. This should be supported by the following by policymakers: building sufficient infrastructure to construct schools and training for teachers. Ethical concerns about data privacy, and screen time, also take place. Limitations include the small sample size, short period of time, and a single school setting. We may eventually use longitudinal studies to compare varied AI use.

Conclusion

The present study provides strong evidence that AI-assisted instruction can enhance the English speaking performance of primary school learners. AI-supported apps helped learners



with pronunciation, fluency, vocabulary, and intelligibility through practicing in spoken words, immediate feedback, and interactive activities. As the intervention boosted confidence and motivation therefore AI could also promote an enabling and positive atmosphere for oral language learning. Therefore, while further research is indicated, the results suggest the potential of AI to make a difference in the classroom of early learning children if it is used within an adequate pedagogy.

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