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METHODOLOGY OF USING DIGITAL EDUCATIONAL TOOLS IN TEACHING THE PHONETICS SECTION IN PRIMARY GRADES

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Abstract. This article examines the methodological foundations for integrating digital educational tools into the teaching of phonetics in primary grades. Phonetics is a key component of language education because it develops learners' awareness of speech sounds, letter–sound correspondences, syllable structure, stress, pronunciation and the relationship between oral and written language.

Keywords: primary education; phonetics; digital educational tools; phonological awareness; pronunciation; interactive learning; formative assessment; teaching methodology.

1. Introduction

The development of language competence in primary school begins with the systematic understanding of how spoken language is organised and represented in writing. Phonetics provides pupils with knowledge and practical skills related to speech sounds, their articulation and acoustic characteristics, syllables, word stress, intonation and sound–letter relationships. These skills are closely connected with early reading, spelling, fluent oral expression and the ability to distinguish meaningful sound contrasts. Therefore, phonetics should not be taught as a collection of abstract definitions; it should be approached through listening, observation, articulation, comparison, analysis and purposeful language use.

In the early grades, pupils learn most effectively when new linguistic concepts are presented through concrete examples and repeated opportunities to hear, pronounce,

identify and manipulate sounds. The teacher's explanation remains essential, but digital resources can enrich the learning environment by making sound visible, replayable and comparable. For example, a pupil can listen to a recorded word several times, compare two pronunciation models, move digital letter tiles to represent a word, or receive immediate feedback on a short classification task. Such activities can connect auditory perception with visual representation and active practice.

The use of technology, however, does not automatically improve learning. The Education Endowment Foundation recommends beginning with a clear learning need and considering how technology can strengthen explanation, modelling, pupil practice, assessment or feedback. UNESCO similarly emphasises that digital technology should support, rather than replace, purposeful teaching and human interaction.[2] These principles are particularly important in primary education, where attention, language development, social interaction and physical activity must be considered together.

Research on tablet-supported phonological awareness and phonics instruction reports mixed outcomes across studies. The systematic review by Parry, Kumar and Gallingane found that tablet-based instruction can be comparable to traditional approaches and may offer benefits when integrated with teacher guidance; the authors also stress the importance of evaluating the quality of applications.[3] This suggests that the central methodological question is not whether a lesson uses a device, but whether the selected tool helps pupils achieve a clearly defined phonetic learning outcome.

The purpose of this article is to substantiate a practical methodology for using digital educational tools when teaching phonetics in primary grades. The objectives are to: (1) identify the phonetic skills that can be supported digitally; (2) classify suitable tools according to their didactic functions; (3) propose a staged lesson model; and (4) formulate criteria for evaluating the pedagogical effectiveness and appropriateness of digital activities.

2. Materials and methods

The article employs a qualitative, practice-oriented approach based on analysis of

scholarly literature, research reviews and international guidance on early literacy and educational technology. The materials include the National Reading Panel's synthesis of evidence on phonemic awareness and phonics, the systematic review of tablet integration by Parry and colleagues, the Education Endowment Foundation's guidance on digital technology, and UNESCO's 2023 Global Education Monitoring Report. The sources were examined to identify principles that can be translated into classroom procedures for primary-level phonetics.

The analysis was organised around four dimensions: (a) the phonetic content to be taught; (b) the affordances of digital tools; (c) the teacher's instructional actions; and (d) evidence of pupil learning. The content dimension includes phoneme identification, sound discrimination, letter–sound correspondence, syllable segmentation, sound blending, pronunciation, stress and intonation. The tool dimension considers audio, visual, interactive and assessment functions. The instructional dimension focuses on explicit modelling, guided practice, independent application and feedback.

A comparative and pedagogical-design method was used to match each learning objective with an appropriate digital activity. For instance, audio playback is suitable for repeated listening and sound discrimination, while movable grapheme tiles are useful for representing the sequence of sounds in a word. Short interactive quizzes can support retrieval practice and provide teachers with information about common errors. The design principle is that the digital function must be directly connected to the phonetic skill being developed.

The methodological model proposed in this article is not presented as an experimentally validated intervention. Rather, it is a synthesis-based instructional framework intended for adaptation and subsequent classroom testing. Its effectiveness should be evaluated in local conditions through pre- and post-assessment, observation, analysis of pupil work and teacher reflection. This distinction is important because findings from one language, age group or technological context cannot automatically be generalised to every primary classroom.

3. Results and discussion

3.1. Didactic potential of digital tools in phonetics lessons

Digital educational tools can perform several complementary functions. First, audio resources provide authentic and repeatable sound models. Teachers may record words, minimal pairs, syllables or short utterances and ask pupils to identify a target sound, compare pronunciation or mark the position of a sound in a word. Replay and controlled listening are particularly useful for pupils who need additional time to perceive a contrast.

Second, visual and interactive resources can connect sound with its written representation. Digital cards, letter tiles and sound boxes allow pupils to arrange graphemes, segment words into phonemes or match a spoken item to a written form. The National Reading Panel found that phonemic-awareness instruction is especially productive when pupils are taught to manipulate phonemes in connection with letters. This supports the integration of listening and letter-based tasks rather than teaching sounds in isolation.

Third, interactive whiteboards and presentation software can support explicit modelling. A teacher can display a word, highlight its letters, play its pronunciation and guide pupils through the process of identifying and ordering sounds. Animation should be restrained and purposeful: it must clarify the relationship between sound and symbol rather than distract pupils with decorative effects. Fourth, educational games can increase the amount of purposeful practice. Activities such as sound sorting, syllable matching, identifying the first or final sound, and selecting a word with a given phoneme can be organised as short individual, pair or team tasks.

Fifth, digital assessment tools can help teachers collect evidence during the lesson. A short quiz, digital exit ticket or recorded oral response may reveal whether pupils can distinguish a sound, identify its position or apply a letter–sound correspondence. The information should be used to plan feedback and follow-up instruction, not merely to generate scores. The Education Endowment Foundation notes that technology can

support assessment and feedback when its use is aligned with the learning process.

3.2. A staged methodology for teaching phonetics

The proposed methodology consists of five interrelated stages. Stage 1—diagnosis and motivation. The teacher begins with a brief oral task: pupils listen to several words and identify a familiar sound, distinguish similar sounds or clap the syllables. A simple digital poll or picture-and-audio activity may be used to identify prior knowledge. The teacher also observes articulation and listening difficulties.

Stage 2—explanation and modelling. The teacher introduces the target concept using a clear verbal explanation, examples and a digital representation. When teaching a particular sound, the teacher may play a model recording, show the relevant letter and demonstrate how the sound is produced. Pupils listen, observe the teacher's articulation and repeat the sound. A mirror or face-to-face modelling can complement the digital material, since a screen should not replace direct observation and interaction.

Stage 3—guided practice. Pupils complete tasks with teacher support. Examples include matching a sound recording to a letter, sorting words by their initial sound, identifying the number of syllables, or placing digital tiles in the correct sequence. The teacher pauses after each task to ask pupils to explain their choices. Immediate correction is important: pupils should hear the correct model, repeat the item and understand why an answer is appropriate.

Stage 4—independent and collaborative practice. Pupils work individually, in pairs or in small groups. One pupil listens to an audio card and identifies the target sound; another selects the corresponding letter or places the word in a category. Roles can then be exchanged. Tasks should progress from recognition to analysis and application: identifying a sound, locating it in a word, segmenting the word, and using the word in an oral sentence. A paper-based alternative should be available when devices or connectivity are limited.

Stage 5—assessment, reflection and reinforcement. The teacher uses a brief digital or oral assessment to check the stated objective. Pupils may record a word, select the

matching sound pattern or complete a short exit task. The teacher analyses errors and assigns differentiated follow-up activities. A pupil who confuses two sounds may receive additional listening and comparison tasks, while a pupil who has mastered the content may analyse longer words or explain a sound pattern.

3.3. Sample lesson sequence: identifying the first sound in a word

Learning objective: pupils identify the first sound in familiar words and connect it with the corresponding letter. Resources: a computer or tablet, speakers, a short set of teacher-checked audio recordings, digital picture cards, letter cards and a board. The teacher first displays three familiar pictures and asks pupils to name them. Pupils listen to each word and say which sound they hear at the beginning. The teacher models the sound clearly and shows the corresponding letter.

During guided practice, pupils listen to a recording and select the picture that begins with the target sound. They then drag or place the relevant letter next to the picture. In pair work, one pupil chooses a picture and the other identifies its first sound; they exchange roles. The teacher checks pronunciation and asks pupils to explain how they identified the sound. At the end, pupils complete a three-item exit task and say one additional word beginning with the same sound.

Assessment criteria include: accurate identification of the initial phoneme; correct matching of sound and letter; clear oral production; and the ability to provide another example. The teacher records results using a simple three-level rubric: independent, achieved with prompting, and requires further support. The rubric focuses on observable performance rather than speed or the number of points earned in a game.

3.4. Differentiation, inclusion and classroom management

Digital activities should be adapted to pupils' different levels of language development, reading readiness, hearing and visual needs, and access to devices. Differentiation can be achieved by adjusting the number of items, the length of recordings, the complexity of sound contrasts, the availability of visual cues and the amount of teacher support. Pupils who need more support may work with familiar words

and repeated audio. More advanced pupils may compare sounds in different word positions, analyse syllable structures or explain how a sound change affects a word.

Accessibility should be planned from the beginning. Audio instructions can be accompanied by written or pictorial directions; videos should include captions where appropriate; colours should not be the only means of conveying information; and interfaces should use readable fonts and uncluttered layouts. Teachers should check that recordings are clear, pronunciation models are accurate and examples are suitable for the language variety being taught. Where pupils have hearing or speech-related needs, the teacher should consult relevant specialists and use appropriate alternative representations.

Classroom management is equally important. Digital activities should be short, purposeful and embedded within a varied lesson that includes speaking, listening, movement, printed materials and face-to-face interaction. Devices should be used only when they add a clear instructional benefit. UNESCO cautions that technology's educational value depends on context and should not displace qualified teachers or meaningful human interaction. Teachers should also consider privacy, advertising, age suitability, data collection and the reliability of online content.[7]

3.5. Criteria for selecting digital educational tools

A teacher can evaluate a digital resource using the following criteria: (1) curricular relevance—the tool addresses a specific phonetic objective; (2) linguistic accuracy—sound models and written examples are correct; (3) age appropriateness—the interface and task demands suit primary pupils; (4) interactivity—pupils actively listen, respond, classify or construct rather than watch passively; (5) feedback—the tool or teacher provides useful correction; (6) accessibility—the resource can be used by pupils with differing needs; (7) technical feasibility—it works with available devices and connectivity; and (8) safety and privacy—it does not expose pupils to unnecessary data collection or unsuitable content.

The selection process should begin with the learning objective, not with a

fashionable application. If the objective is to hear a sound contrast, a carefully prepared audio file may be more effective than a complex platform. If the objective is to practise syllable segmentation, physical clapping and counters may be preferable, with a digital task used for reinforcement. This principle reflects evidence-informed guidance that technology should improve the quality of teaching or learning rather than simply add novelty.

When carefully selected and teacher-guided, digital tools may increase opportunities for repeated listening, provide clear audio models, connect sounds with visual symbols, support differentiated practice and make formative assessment more efficient. They can also enable pupils to revisit a task at an appropriate pace and allow teachers to notice patterns of misunderstanding. These affordances are particularly relevant in phonetics, where accurate perception and repeated practice are central.

Nevertheless, several limitations must be acknowledged. Poor-quality audio can reinforce incorrect pronunciation; excessive animation can divert attention; competitive games may prioritise speed over accuracy; and unequal access to devices can create differences in learning opportunities. Some applications provide feedback that is too generic or fail to recognise acceptable pronunciation variants. A digital score should therefore never be treated as a complete measure of a pupil's phonetic competence.

The review by Parry and colleagues indicates that outcomes from tablet integration in phonological awareness and phonics are mixed and that teacher guidance remains important. This finding supports a blended approach in which technology supplements explicit teaching, oral interaction, printed resources and teacher observation. The teacher remains responsible for selecting content, interpreting pupil responses, correcting errors and ensuring that activities serve the curriculum.

For future classroom research, the proposed methodology can be evaluated through a small-scale intervention. Researchers may compare pupils' performance before and after a sequence of lessons, using parallel tasks on sound identification, phoneme segmentation, letter–sound matching and pronunciation. Classroom observation and

teacher interviews can help explain how pupils engage with the tools. Any comparative study should describe the sample, duration, teaching materials, assessment instruments and limitations transparently; conclusions should not be drawn from engagement or enjoyment alone.

4. Conclusion

The teaching of phonetics in primary grades can be enriched through the purposeful integration of digital educational tools. Audio recordings, interactive letter–sound activities, visual modelling, educational games and formative-assessment resources can support pupils' listening, sound discrimination, phoneme identification, syllable analysis, pronunciation and understanding of sound–letter relationships. Their value depends on the quality of the pedagogical design, the accuracy of the linguistic content and the teacher's guidance.

The article proposes a five-stage methodology: diagnosis and motivation; explanation and modelling; guided practice; independent and collaborative practice; and assessment with reflection and reinforcement. This sequence connects digital activities with explicit learning objectives and creates opportunities for repeated practice and differentiated support. The sample lesson on identifying the first sound in a word illustrates how audio, picture cards, letter representations and oral interaction can be combined within one coherent lesson.

The main methodological conclusion is that digital tools should not replace the teacher, direct speech practice or concrete learning materials. They should be selected only when they provide a meaningful advantage, such as replayable sound models, immediate practice opportunities or timely assessment information. Age appropriateness, accessibility, privacy, technical feasibility and linguistic accuracy must be considered before classroom use.

The proposed framework is literature-informed and requires empirical validation in primary classrooms. Further research may examine its impact on pupils' phonological awareness, pronunciation accuracy, spelling and early reading outcomes across different

grade levels and language contexts. Such research should also investigate teachers' digital competence and the conditions necessary for equitable access.

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