

Teaching Academic Spelling Through Morphemes: An Innovative Learning Experience for Dyslexic Undergraduates

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Abstract

This paper reports a small-scale intervention addressing spelling and academic vocabulary difficulties among dyslexic undergraduates in computing and digital arts. Although phonics-based approaches dominate earlier education, morphemic awareness and etymology remain underused in higher education despite their value for disciplinary vocabulary. Five dyslexic students each studied ten previously unmastered academic or technical words through explicit teaching of prefixes, roots, suffixes, and word origins, supported by a lightweight digital tool for visual morphemic breakdown and guided spelling practice. Post-intervention assessment showed 85% spelling accuracy across the target words. Qualitative feedback also indicated greater confidence, better decoding of unfamiliar vocabulary, and stronger engagement with academic language. The findings suggest that morpheme-based teaching is a promising inclusive strategy in higher education.

Keywords: *Dyslexia, morphemes, spelling, innovative teaching.*

1. Introduction

Dyslexic students in higher education often continue to experience difficulties with spelling and academic vocabulary, even when these skills are assumed to be secure. Although many develop strategies to support reading and writing, accurate spelling can remain a persistent challenge, especially in disciplines such as computer science and digital arts computing, where dense technical language and complex terminology are common.

University support for dyslexic learners has increasingly emphasised reasonable adjustments and assistive technologies such as spellcheckers, predictive text, and speech-to-text tools. While these improve access to learning, they do not necessarily develop independent spelling strategies or deeper understanding of academic vocabulary. Spelling therefore risks being treated as a secondary issue rather than an area for active learning (Mortimore & Crozier, 2006).

Literacy instruction for dyslexic learners has traditionally prioritised phonological approaches, particularly in early education. Although phonological awareness is important, it is often insufficient for university-level academic spelling. Many academic and technical terms are morphologically complex and shaped by Greek and Latin origins (Bowers et al., 2010).

Morphemic awareness offers a complementary approach by focusing on prefixes, roots, and suffixes. Research shows it can support spelling, vocabulary development, and reading comprehension, particularly for older learners working with advanced academic language (Carlisle, 2010; Reed, 2018; Kieffer & Lesaux, 2018). Yet explicit teaching of morphemes and word origins remains rare in higher education.

This paper reports a morpheme-based intervention for dyslexic undergraduates in computer science and digital arts computing. Using course-related academic and technical vocabulary, the study combined explicit teaching of word structure and meaning with a simple digital tool supporting visual morphemic analysis and guided spelling practice. It contributes to discussions of inclusive pedagogy and highlights the potential of morpheme-based teaching in higher education.

2. Background

Spelling difficulties in dyslexic learners are well documented and often continue into adulthood. In higher education, these difficulties can be particularly serious because students must work independently with complex texts and produce accurate academic writing under time pressure. Yet spelling is rarely taught explicitly at university, where literacy is often assumed to be secure. This can leave dyslexic students reliant on compensatory strategies rather than longer-term development.

Academic vocabulary is often morphologically complex, especially in computer science and digital arts computing, where many terms draw on Greek and Latin roots. Words such as algorithm, encryption, and virtualisation carry meaning through their structure, but this is seldom made explicit to learners. For dyslexic students, who may struggle with phonological processing but show strengths in analytical thinking, this is a missed opportunity (Law et al., 2015; Elbro & Arnbak, 2016). Figure 1 summarises the relationship between academic vocabulary demands, spelling challenges, and morpheme-based instruction.

Research shows that morphemic awareness can support spelling and vocabulary development, particularly for older learners working with advanced academic language (Carlisle, 2010; Goodwin et al., 2017; Crosson et al., 2019). However, such instruction is rarely embedded in higher education. Spelling support is often generic and detached from disciplinary study, whereas discipline-specific vocabulary offers a more meaningful context for developing both spelling and conceptual understanding (Bowers et al., 2010).

This study is grounded in the need for inclusive approaches that move beyond accommodation towards skill development. Rather than treating spelling as a deficit managed through assistive technology, the intervention approaches it as a learnable skill supported through explicit teaching. It combines morphemic instruction with computing-related academic vocabulary and uses a simple digital tool to reinforce teaching through visual word structure and independent practice. Together, these elements highlight the value of exploring morpheme-based teaching in higher education and contribute empirical evidence to an underexplored area

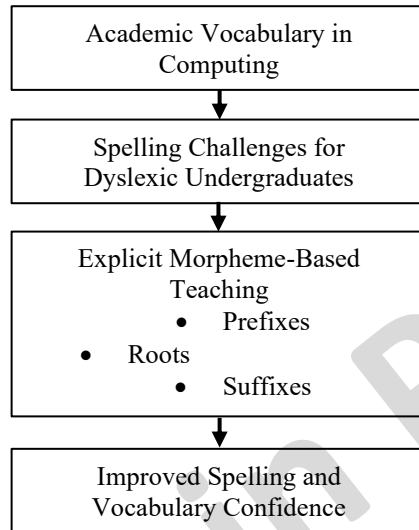


Figure 1. Conceptual framework illustrating how explicit instruction in morphemes and word origins supports spelling development and academic vocabulary engagement for dyslexic undergraduate students in computing-related disciplines

3. Teaching Context and Participants

The intervention was conducted within a higher education support context and involved five undergraduate students with a formal diagnosis of dyslexia, all enrolled in computer science or digital arts computing. These disciplines were chosen because of their reliance on technical and abstract vocabulary, which often presents challenges for dyslexic learners.

All participants were receiving academic support alongside their degree programmes and reported continuing difficulties with spelling, particularly specialist terminology needed for coursework and assessment. Although they regularly used assistive technologies such as spellcheckers and predictive text, these were not sufficient for accurate spelling of discipline-specific vocabulary.

At the start of the intervention, each student identified ten academic or technical words from their course materials that they could not spell accurately. These were selected collaboratively

with the tutor to ensure relevance and appropriate challenge. The final word sets reflected terminology students were expected to understand and use independently in their academic work.

Teaching was delivered through a combination of small-group and individual sessions, allowing discussion, clarification, and personalised explanation. This supported flexible pacing and responsiveness to individual needs while maintaining a consistent pedagogical approach. The intervention was designed as a short, targeted learning experience rather than a long-term programme, reflecting the practical constraints of higher education support. Although the small cohort does not allow statistical generalisation, it provides a detailed account of an authentic university intervention and supports exploration of morpheme-based teaching as an innovative inclusive approach for dyslexic undergraduates.

4. Description of the Teaching Intervention

The intervention provided explicit instruction in morphemes and word origins to support spelling development in dyslexic undergraduates. Rather than relying on phonological strategies or memorisation, it focused on how academic words are constructed and how meaning is encoded in their structure. Teaching used vocabulary drawn directly from students' degree programmes to ensure relevance and immediate application.

Each session focused on a small set of target words chosen by the students. Words were broken into prefixes, roots, and suffixes, with attention to the meaning of each part. Students explored how these elements combined to create the overall meaning and how similar morphemes appeared in related academic terms. This was intended to promote pattern recognition and transfer to unfamiliar vocabulary.

Word origins, especially Greek and Latin roots, were introduced where relevant. Explanations were brief and focused on meaning rather than historical detail, helping students see spelling as structured and logical. This was particularly useful for abstract technical terms in computing. Teaching was interactive and dialogic, encouraging students to analyse words, discuss meanings, and explain their spelling decisions. This emphasis on process rather than simple correctness supported metacognitive awareness and greater confidence in spelling strategies.

A simple digital tool reinforced learning beyond the sessions. It visually segmented target words into morphemes using colour-coding for prefixes, roots, and suffixes, and included brief explanations and guided spelling practice. The tool was designed to support teaching rather than replace it. An example of how academic vocabulary was analysed and taught using morphemic structure is shown in Figure 2.

Students were encouraged to use the tool independently between sessions when revisiting taught words and applying strategies to new vocabulary. This combination of explicit instruction and supported independent practice aimed to strengthen retention and transfer.

Target Word: VIRTUALISATION

Prefix	Root	Suffix
Virtual (existing in concept)	-ise- (to make or cause)	-ation (process or result)

Figure 2. Example of morphemic analysis used during teaching sessions, demonstrating how academic vocabulary was broken into prefixes, roots, and suffixes to support spelling accuracy and understanding of meaning.

5. Methodology

The study used a small-scale, practice-based evaluation approach suited to investigating an innovative teaching experience within authentic higher education practice. Its main aim was to explore whether explicit morpheme-based instruction could support spelling development in dyslexic undergraduates and to capture students' responses to the approach.

Participants were five undergraduate students with a formal diagnosis of dyslexia studying computer science or digital arts computing. All reported persistent difficulties with spelling, particularly academic and technical vocabulary required for their degree programmes. Before the intervention, each student identified ten academic or discipline-specific words they could not spell accurately. These words formed the basis of both teaching and evaluation.

Spelling ability was assessed informally before and after the intervention. At baseline, students attempted to spell their selected words without support, confirming consistent inaccuracy. After the intervention, they were asked to spell the same words again without the digital tool or other aids. Success was defined as accurate spelling of the target word.

Quantitative outcomes were calculated by aggregating correctly spelled words across participants in the post-intervention assessment. Given the small sample, analysis was descriptive rather than statistical, and findings are reported as overall success rates.

Qualitative data were also gathered through informal discussion and reflection during and after the intervention. Students commented on their confidence, understanding of word structure, and the usefulness of the morphemic approach. These reflections helped contextualise the quantitative findings and provide insight into their learning experience. Ethical considerations followed standard educational practice. Participation was voluntary, students were informed of the study's purpose, and no identifiable personal data were recorded. The intervention was

conducted as part of routine academic support teaching, with the aim of improving learning outcomes rather than experimental manipulation.

6. Findings

The intervention improved spelling accuracy across all five students. Each was taught ten academic or technical words they had previously been unable to spell. In the post-intervention assessment, students spelled the same words without support, achieving an overall accuracy rate of 85% across fifty target words. A summary of spelling outcomes is presented in Figure 3.

Although performance varied slightly, all students improved from baseline. Some were able to spell words they had previously avoided in written work, while remaining errors were often partial, suggesting improved awareness of word structure.

Qualitative feedback reinforced these findings. Students reported greater confidence with unfamiliar academic vocabulary and a stronger sense of control through understanding prefixes, roots, and suffixes (MacCullagh et al., 2017). Several also applied morphemic analysis to new words encountered in lectures and reading. Students valued learning about Greek and Latin roots, which supported both spelling and comprehension. The digital tool was viewed as a useful aid for revision and consolidation rather than a substitute for teaching. Overall, the findings indicate that explicit morpheme-based teaching can improve spelling accuracy and confidence in dyslexic undergraduates.

Participants: 5 dyslexic undergraduate students - Computing and Digital Arts Computing

Post-Intervention Outcomes
Total target words: 50
Correctly spelled: 43 (success rate: 85%)
Increased spelling confidence / Improved vocabulary awareness

Figure 3. Summary of spelling outcomes following the morpheme-based teaching intervention, showing overall spelling success and reported improvements in confidence and vocabulary awareness.

7. Discussion and Conclusion

The findings suggest that a morpheme-based approach to spelling can benefit dyslexic undergraduates, particularly in disciplines reliant on technical and abstract vocabulary. The improvement in spelling accuracy indicates that explicit teaching of word structure and meaning

can support learning in ways not always achieved through phonological strategies or assistive technologies alone.

One reason for this may be the intervention's emphasis on meaning rather than sound (Goodwin & Ahn, 2013; Reed, 2018). Many academic terms in higher education are morphologically complex and not easily decoded through phonics. Focusing on prefixes, roots, and suffixes aligned more closely with academic vocabulary and with strengths often associated with dyslexic learners, including analytical reasoning and pattern recognition.

The discipline-specific nature of the vocabulary also appears important. Using words taken directly from students' course materials increased relevance and motivation, while supporting transfer to academic tasks. Rather than treating spelling as a generic skill, the intervention positioned it as part of disciplinary learning. Teaching word origins further supported retention and understanding. Etymological explanations helped make spelling patterns appear more logical and strengthened connections between spelling and meaning. For computing students, this appeared to support both literacy and subject understanding.

The digital tool functioned as reinforcement rather than a central teaching mechanism, highlighting technology's value as an aid to pedagogy rather than a substitute. Its simplicity and visual structure supported independent practice without cognitive overload. The study has limitations, including its small sample, short duration, and reliance on informal assessment and qualitative feedback. However, its purpose was to evaluate an authentic teaching practice in a real higher education context. Overall, the findings suggest that morpheme-based teaching is a promising and underused approach for supporting dyslexic students in higher education, shifting the focus from accommodation towards skill development and learner empowerment.

This paper has presented a small-scale intervention using explicit teaching of morphemes and word origins to support spelling development in dyslexic undergraduates in computing-related disciplines. The findings suggest that this approach can improve spelling accuracy, achieving 85% success across previously unspellable academic words, while also increasing confidence and engagement with academic vocabulary. The study shows that spelling difficulties at university should not be addressed only through assistive technologies. Instead, spelling can be treated as a learnable skill supported through teaching that makes word structure and meaning explicit. Morpheme-based instruction therefore offers an approach well suited to higher education and to many dyslexic learners. Although based on a small sample, the study provides empirical insight into an authentic university teaching practice and contributes to discussions of inclusive pedagogy in disciplines shaped by complex technical language. Future work could examine this approach with larger cohorts, across other disciplines, and over longer periods, while also refining digital tools that support morphemic learning. More broadly, the study challenges the assumption that spelling development should end before university.

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