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HOW DOES INTEGRATING TIER 3 VOCABULARY INTO LESSON STARTERS INFLUENCE STUDENTS' USE OF SUBJECT-SPECIFIC TERMINOLOGY IN DESIGN AND TECHNOLOGY ASSESSMENTS AND PRACTICAL WORK?

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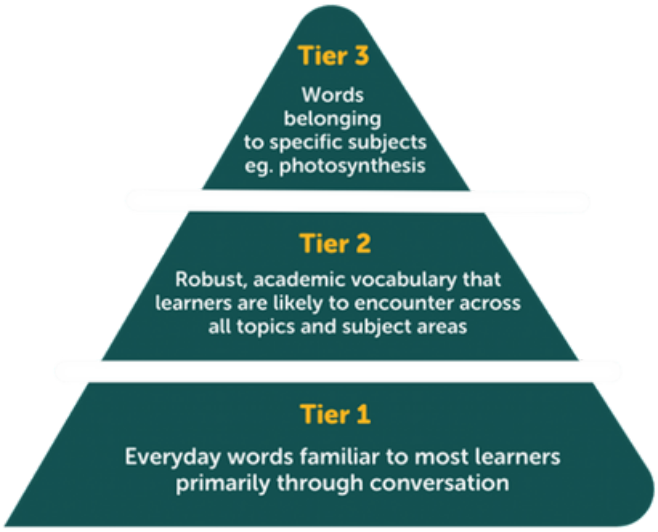
Introduction

This article presents an action research study investigating the impact of prioritising Tier 3 vocabulary on students' formative assessments and practical outcomes in Design and Technology. Tier 3 vocabulary (see **Figure 1**) refers to subject-specific terminology that is essential for developing a deep and accurate understanding of disciplinary content (Beck et al., 2002). In the context of Design and Technology, the ability to comprehend and apply such terminology enhances students' subject knowledge, supports technical writing, and contributes to overall academic achievement (Davies, 2022). This study explores how the intentional use of Tier 3 vocabulary can strengthen students' technical understanding in both written and practical tasks.

Figure 1
The three tiers of vocabulary (Triggs, 2024)



Lesson starters provide a valuable opportunity to reinforce key vocabulary in a focused and low-pressure setting. Regular retrieval practice and the integration of Tier 3 terminology into these activities can help students develop a deeper understanding of subject-specific language and connect terms to their practical applications (Parenti et al., 2018). By explicitly teaching and revisiting Tier 3 vocabulary at the start of each lesson, this study aims to examine the extent to which this approach supports students' retention and application of technical language within Design and Technology.

Methodology

This action research study adopted a mixed-methods approach, combining both quantitative and qualitative data collection and analysis to investigate the impact of explicitly teaching Tier 3 vocabulary on students' performance in Design and Technology. The research aimed to explore a targeted pedagogical issue—the limited understanding and use of subject-specific terminology—and implement an intervention with the potential for timely and measurable improvement in both written and practical work.

The study was guided by the following research questions:

- To what extent does a focus on Tier 3 vocabulary improve students' written assessments?
- Does enhanced understanding of Tier 3 terminology contribute to improved practical outcomes?

A total of 124 Year 8 students across six Design and Technology classes participated in the study, comprising 57 female and 67 male students. The cohort included:

- 12 students with Special Educational Needs (SEN)
- 12 English Language Learners (ELL)
- 11 students identified as low ability
- 17 students identified as high ability

Data was collected through both formative assessments and student feedback. Assessments were conducted on paper and results were recorded in Microsoft Excel, while feedback was gathered via a Microsoft Forms questionnaire, providing a combination of quantitative and qualitative data.

The assessment data was analysed compare students' baseline performance with results obtained after a four-week intervention period focused on Tier 3 vocabulary during lesson starters. Students were grouped by ability and learning needs (high ability, low ability, ELL, and SEN) to evaluate the impact across different subgroups. The percentage change in performance between the two assessment points was calculated to measure progress.

Student feedback was analysed to provide further insight into the effectiveness of the intervention. While closed-question responses from Microsoft Forms were automatically summarised, open-ended responses were manually reviewed and thematically analysed to capture students' perceptions and experiences.

Results

Figure 2
The % difference between each category of students from their first to second formative assessment

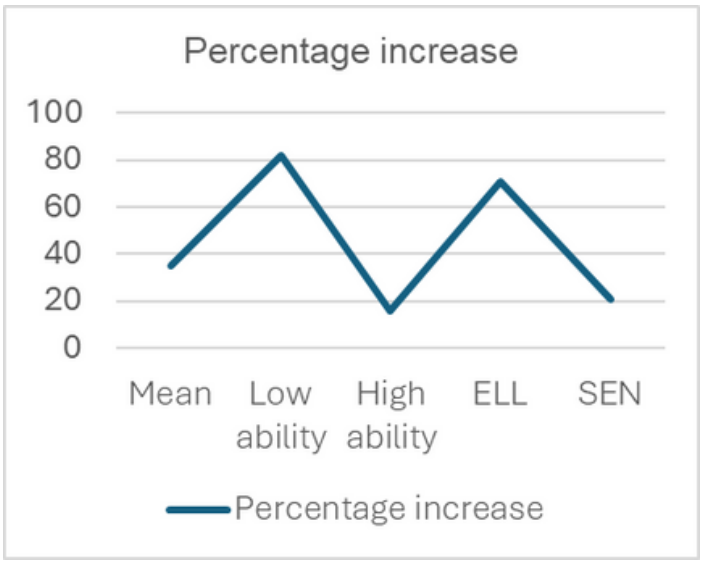
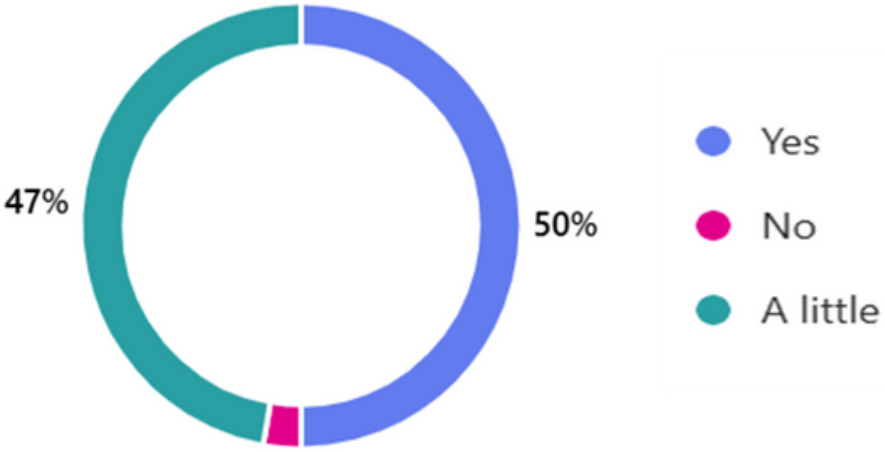


Figure 3
Student's questionnaire feedback about how Tier 3 vocabulary supported their practical work

Did learning about forces help with your bridge design and manufacture?



Discussion and Reflections

The data gathered from the formative assessment has shown an average improvement of 34%. The greatest improvement came from low ability and ELL learners with a staggering 82% and 71% improvement (see **Figure 2**). Although high ability students only saw a 16% improvement, Tier 3 vocabulary still supported their practical work according to the student survey. A surprising observation was that SEN students encountered difficulties with the formative assessment and only showed a 21% improvement therefore there is further research needed to discover better ways of teaching Tier 3 vocabulary for them. Student feedback clearly highlights the impact of Tier 3 terminology, with 97% reporting it supported them during their practical (see **Figure 3**).

Conclusion

This research shows that integrating Tier 3 vocabulary into lesson starters, alongside real-life examples, has improved students' understanding and use of subject-specific terminology in both assessments and practical work. Adopting this vocabulary during tasks has led to better outcomes of practical work and deeper comprehension of key terms.

Further investigation is needed to explore the secondary research question: Does a deeper understanding of Tier 3 vocabulary directly improve the quality of students' practical work? Future studies should also consider developing more tangible methods for measuring improvements in vocabulary application and their impact on practical outcomes across a broader range of Design and Technology topics.

References

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