

# Knowledge Retention with Video Modules Versus Lectures in Dental Education

Belkoff A, Swee G, Saavedra R, Finkelman M., Loo CY (Tufts University School of Dental Medicine, Boston, MA)

TUSDM IRB  
Approval #6780



**Tufts**  
UNIVERSITY  
School of  
Dental Medicine

## Introduction

- Dental education has traditionally relied on lecture-based instruction to introduce clinical concepts; however, this approach may be limited in promoting engagement, long-term retention, and the development of procedural skills (1).
- Video-based learning has increasingly been incorporated into dental education due to its accessibility, repeatability, and potential to supplement traditional instruction while addressing faculty and curricular constraints (1).
- Prior studies have demonstrated that enhanced or mixed-media video instruction can improve short-term knowledge acquisition and student satisfaction compared to conventional lectures (2,3).
- Video-based learning has been shown to support learner engagement, curiosity, and self-directed learning, which may contribute to improved short-term educational outcomes in medical and dental education (4).
- Video instructional formats have also demonstrated effectiveness in reinforcing procedural knowledge and performance when delivered immediately prior to clinical tasks (5,6).
- There is limited research evaluating the use of structured, short video modules for teaching pediatric dentistry.

## Objective

To compare knowledge acquisition and short-term knowledge retention related to space maintainers and dental trauma, as measured by quiz performance, between third-year dental students who receive short-form video instruction and those who receive traditional lecture-based instruction.

## Methods

Third-year dental students at Tufts University School of Dental Medicine (TUSDM) were included during their pediatric dentistry rotation. Students were divided into two cohorts based on academic year.

The **2025 cohort (n = 158)** received traditional lecture-based instruction, while the **2026 cohort (n = 76)** received short-form educational videos covering the same material (**total N = 234**).

All participants completed the same post-instruction quiz consisting of **five questions**. Outcomes included total number of correct responses (0–5) and performance on individual questions.

Statistical analysis was performed to compare performance between groups. Chi-square or Fisher's exact tests were used for individual question analysis, and the Mann-Whitney U test was used to compare total scores. Statistical significance was set at **p < 0.05**. SPSS 31 (IBM Corp., Armonk, NY, USA) was used in the analysis.

## Results

Distribution of Total Correct Responses by Year

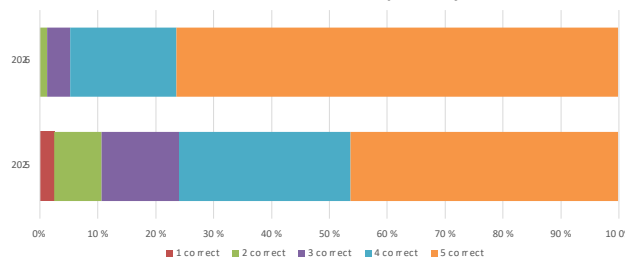


Figure 1: Distribution of total correct responses (1–5) by year. Students in the 2026 cohort showed a significantly greater percentage of higher scores than students in the 2025 cohort ( $p < 0.001$ ).

## Results (Continued)

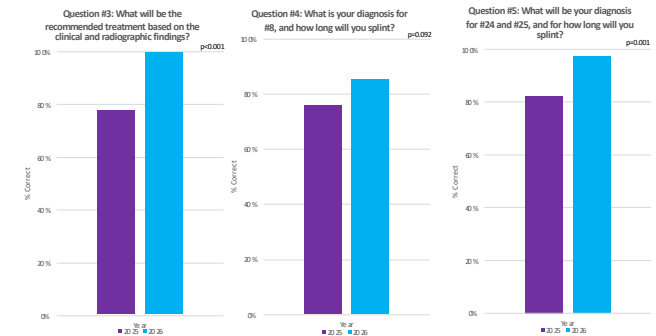
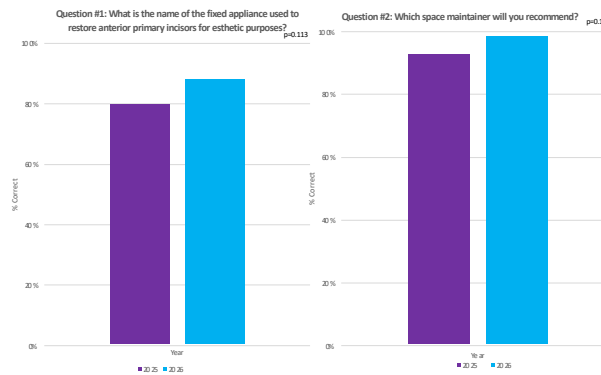


Figure 2A–E. Percentage of correct responses for each quiz question by year. Across all questions, the 2026 cohort demonstrated higher accuracy compared to the 2025 cohort, with statistically significant improvements observed in Questions 3 and 5.



## Conclusion

Short-form educational videos were associated with improved quiz performance compared to traditional lecture-based instruction among third-year dental students. A statistically significant difference in total scores was observed between the 2025 and 2026 cohorts, with higher performance in the video-based group.

Additionally, individual question analysis demonstrated statistically significant improvement in Questions 3 and 5. These findings suggest that short-form video instruction may be a more effective method for knowledge acquisition in pediatric dental education.

Further studies with larger sample sizes and evaluation of long-term knowledge retention are warranted.

## References

- Diaz da Silva, M. A., Pereira, A. C., & Walmley, A. D. (2019). Who is providing dental education content via YouTube? *British Dental Journal*, 126(6), 437–442. <https://doi.org/10.1038/s41415-019-0046-8>
- Abd-Shukor, S. N., Yahya, N., Tami, A. M., Botelho, M. G., & Ho, T. K. (2021). Effectiveness of enhanced video-based learning on removable partial denture module. *European Journal of Dental Education*, 25(4), 744–752. <https://doi.org/10.1111/eje.12653>
- Fu, B. A., Interante, M. A., & Castagna, D. M. (2020). Pilot study implementing mixed media and animation into the preclinical dental anesthesia course. *Journal of Dental Education*, 84(9), 1046–1052. <https://doi.org/10.1002/jde.12185>
- Wang, V., Cheng, Y. T., & Liu, D. (2016). Improving education: just-in-time splitting video. *The Clinical Teacher*, 13(3), 183–186. <https://doi.org/10.1111/act.12384>
- McKoy, J., Wasserman, M., Montetava, M. C., Hirsch, A. W., & Nagler, J. (2023). Just-in-time procedural training for pediatric emergency medicine trainees: A randomized educational interventional trial. *Academy of Medical Education and Training*, 7(3), e10886. <https://doi.org/10.1002/aemt.10886>
- Alkhatani, R. N., Alshufay, B. M., Alhajar, R. S., Alnashry, S. M., Elhathi, J. M., & Aljudabi, S. M. (2025). Comparing the efficacy of live vs. video instructional demonstrations in dental education: A systematic review and meta-analysis. *BMC Medical Education*, 25, 108. <https://doi.org/10.1186/s12909-025-06472-3>