

Integration of Digital Tools in a Cardiac Sonography Program

Liberty Cowden

Lamar University

EDLD 5303 D31 _OL

Glen Harrison

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Digital tools play an increasingly important role in supporting student learning, assessment, and clinical readiness in cardiac sonography education. As a professor in a community-college cardiac sonography program, I continually evaluate emerging technologies to determine how they can enhance instruction, streamline assessment, and improve student outcomes. This paper examines five tools—ZipGrade, Notebook LM, Quizizz, Poll Everywhere, and Showpad—and describes their advantages, disadvantages, and practical applications within my professional context.

ZipGrade

ZipGrade is a mobile grading tool that allows me to scan and score paper-based multiple-choice assessments using my smartphone. One of its primary advantages is the significant reduction in grading time, which is particularly beneficial in a program that relies heavily on frequent quizzes and competency checks. The item-analysis feature provides insight into concepts that students consistently miss, which I plan to use in my Advanced Ultrasound Physics course to guide remediation and curriculum adjustments. ZipGrade also supports timely feedback, enabling students to review their performance before entering lab or clinical practice. However, the tool is limited to certain question types, making it less suitable for image interpretation or open-ended clinical reasoning. Students may also mis-bubble answers, and the need to print and manage physical answer sheets can be cumbersome. Despite these limitations, ZipGrade is efficient, reliable, and easy to implement in a community-college setting, supporting consistent assessment practices and freeing time for hands-on instruction.

Notebook LM

Notebook LM is an AI-powered research and organizational tool that synthesizes information from multiple sources. It can summarize complex articles, guidelines, and textbook chapters, making dense cardiac sonography content more accessible to students. I can upload ASE guidelines, lecture notes, and protocols to generate study aids and conceptual explanations. Notebook LM also helps students make connections between topics, such as the relationship between diastolic dysfunction and Doppler waveform patterns. However, students may over-rely on AI summaries rather than engaging with primary sources, and occasional inaccuracies require verification. Academic integrity is another concern, as AI tools can blur the line between appropriate assistance and over-assistance. When used responsibly, Notebook LM supports diverse learners, reduces cognitive overload, and enhances comprehension in a demanding program.

Quizizz

Quizizz is an interactive assessment platform that allows me to create gamified quizzes for both in-class and asynchronous learning. The platform encourages frequent review of cardiac anatomy, physics, and pathology terminology through low-stakes testing. Immediate feedback helps students identify weak areas before high-stakes exams, and performance trends inform my instructional decisions. I use Quizizz to reinforce concepts such as Doppler angle, chamber measurements, and congenital heart defects. Students appreciate the competitive elements of the platform, which help maintain engagement even during dense content review. However, some students may prioritize speed over accuracy, and the platform is less effective for assessing higher-order reasoning or image interpretation. Creating high-quality, competency-aligned

questions requires time. Despite these limitations, Quizizz is highly effective for formative assessment, spaced repetition, and building student confidence before lab.

Poll Everywhere

Poll Everywhere is an interactive response system that allows me to collect real-time answers from students using their phones or laptops. It encourages participation from quieter students and helps me assess understanding immediately after explaining complex topics such as diastolic dysfunction grading or LVOT obstruction. The platform supports image-based questions, enabling me to display echo clips or still frames and ask students to identify structures or pathologies. This feature is particularly valuable in a field where visual interpretation is central to competency. However, reliable internet access is required and creating high-quality polls can be time-consuming. Some students may treat polls casually unless expectations are clearly established. Despite these challenges, Poll Everywhere enhances engagement, supports active learning, and reinforces scanning protocols during lab debriefs.

Showpad

Showpad is a content-management and presentation platform that allows me to organize, deliver, and track educational materials in a structured and accessible way. It centralizes teaching assets such as protocol PDFs, ASE guideline summaries, echo clips, scanning checklists, and lecture slides. This organization ensures that students always access the most current materials and reduces confusion. Showpad also allows me to create interactive learning pathways that guide students through complex topics such as diastolic function or congenital heart disease. Its analytics feature helps me identify which materials students engage with most frequently, informing instructional decisions. However, maintaining updated content requires time, and

some features may feel less intuitive because the platform was originally designed for sales enablement. Despite these limitations, Showpad enhances content delivery, standardizes learning materials, and supports competency-based education in a community-college sonography program.

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