

Development of an invoicing app to engage fourth-year DVM students in clinic financial management

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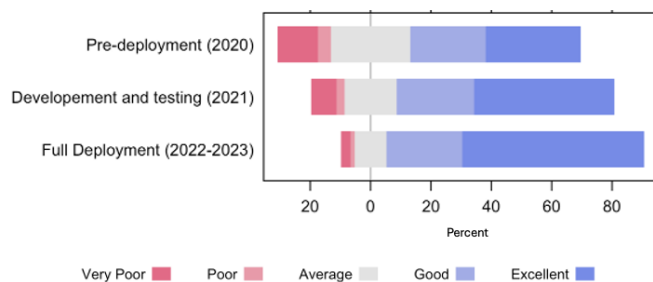
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Our livestock medicine teaching team aims to create a learning environment where final-year DVM students are in the driver's seat for all stages of the consultation, including history-taking, physical examination, medical treatment, record-keeping, and invoicing. After reviewing student feedback in 2020, we concluded that students needed more opportunities to become competent in "Financial and Practice Management," which is the eighth domain in the Competency-Based Veterinary Education Framework.¹ Skills in financial management are important to veterinary graduates, as they are necessary to maintain veterinary business profitability and for clinicians to be effective stewards of client finances. We designed a customizable invoicing app to increase learning in this area. The development process took 12 months and included 3 prototypes. The final version was built using REDCap,² and it allows students to practice invoicing without needing to interface with the teaching hospital billing software.

We believe that this new learning activity has been beneficial for students, which is evident in clinical placement (compulsory, nonanonymous) feedback scores. For example, the average response score for the question, "Rate your opportunity to discuss financial features of cases" (on a 5-point Likert scale; **Figure**), prior to the development of the invoicing learning activity (in 2020) was 3.45 out of 5. The score increased to 3.93 (+0.48; 95% CI, 0.15 to 0.81) during the development phase in 2021, which included pilot testing with students. The average score in 2022 and 2023 (full deployment) was 4.36 (+0.90; 95% CI, 0.62 to 1.20).

The system is now in its third year of deployment, and we continue to learn about how tech-based learning activities can be useful in a clinical setting. We believe that the following factors have contributed to the success of the system. The system is intuitive for students and clinicians to use. We achieved this by seeking feedback from students and clinical instructors during each iteration of the development phase, using a platform that is compatible with most electronic devices (ie, personal computers, smartphones, and tablets), and streamlining functionality to serve a single purpose (ie, invoice practice). We have also created exemplar invoices for common clinical presentations and a demonstration video. The learning activ-



Likert score responses from fourth-year DVM students to the question, "Rate your opportunity to discuss financial features of cases," during 3 phases of development and deployment of an app-based invoicing activity.

ity is engaging for students because it applies real item prices to genuine clinical cases and is performed immediately after the consultation (often en route to the next clinical callout) under the supervision of the clinician. Conducting the invoicing activity in this setting facilitates dynamic interaction between students and their instructors, deepening the learning experience for students and providing valuable feedback to our teaching team on how students are engaging in the activity. Finally, we found that making the learning activity a formal assessment item for the clinical rotation was a powerful incentive for students to proactively engage.

We believe that we can increase scores further through more detailed and deep discussion of more nuanced concepts in clinical financial management. In summary, this new learning activity has allowed us to make incremental improvements to our clinical rotation.

References

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