VIRTUAL PATIENT SIMULATION: ITERATIVE REFINEMENTS TO IMPROVE FUNCTIONALITY AND LEARNING

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SYNOPSIS

The MedSims team utilized the agile approach for platform development, and subsequently a "successive approximation model" (SAM) approach of Instructional Systems Design for optimization of MedSims was favored over the Analysis, Design, Development, Implement, Evaluate (ADDIE) model for the review and implementation phase of the intervention. As part of the ongoing SAM improvement process and design iteration of MedSims, user-generated engagement data were reviewed. These data showed that many learners advanced through the VPS without prescribing treatments or medications despite a patient presentation that warrants prescription of a pharmacological or other therapy. To address this issue, "Orders Helper"—a new functionality that targets learners who attempt to bypass the orders section—was incorporated into the VPS. In the 3 months following the addition of this new function, 81% of learners changed their behavior by going back to revisit the orders page after viewing the Orders Helper.

The remainder of this abstract provides an in-depth exploration of optimization of the Orders Helper function and its impact on learner behavior.

METHOD

Quantitative and qualitative data on learner use of the VPS Prescription Pad function were collected from 3 primary sources:

1. Learner outcomes from participation in successive iterations of the MedSims VPS platform
2. Ad hoc feedback from internal stakeholders of the VPS platform
3. User outcomes from participation in simulations used in comparable high-stakes industries (eg, aviation, military, oil and gas industry)

A series of iterative improvements was made to optimize use of the Prescription Pad function. Learner behavior and outcomes data were collected from each iteration and used to inform the successive iteration.

RESULTS

Baseline analyses showed that there was a relatively low level of learner engagement with the VPS Prescription Pad capability. The Orders Helper function was incorporated and shown to be successful in causing learners to revisit the Prescription Pad as described below.

Iteration 1: Baseline addition of Orders Helper function

Orders Help was first incorporated into the VPS in March 2015 and took the form of pop-up windows that remained on the screen until a treatment was ordered. In the 2 weeks following introduction of the Orders Helper, the percentage of learners using the Prescription Pad increased from 36.5% at baseline to 81% (n=3052).

Despite this success, ad hoc feedback from internal stakeholders pointed out that since the pop-up windows stayed on the screen until a treatment was made, the function did not allow the learner to make the real-life decision of NOT prescribing a therapy.

Iteration 2: Timed disappearance of the Orders Helper

The second iteration provided for disappearance of the Orders Helper after 10 seconds, allowing the user to continue on with the simulation. Learner and stakeholder reviews indicated a perceived ambiguity about the intention to prescribe, likely due to the seemingly unpredictable disappearance of the Orders Helper—learners didn’t know when the Helper would disappear, which meant that the choice to proceed with prescribing was not always intentional.

Iteration 3: Addition of a requirement for active choice to remedy perceived ambiguity that resulted from iteration 2

An additional pop-up window was added that required the learner to actively choose whether to revisit the Prescription Pad or to continue without doing so (Figure 3).

This window was positioned in the center of the darkened screen to optimize the user engagement and required an active choice whether to revisit the Prescription Pad or to proceed to the next step in the VPS visit. These changes removed choice ambiguity and ensured that learner behavior was captured in a way that represents the intention of the learner.

Data generated by learners were reviewed to gauge the level of impact of the implementation of the new feature. In the 3 months following the Helper addition, 7789 learners saw the Orders Helper. From that group of learners, 6289 revisited the orders section. Thus, 81% of the learners changed their behavior by revisiting the Orders section and making prescription decisions as a direct result of the Orders Helper.

DISCUSSION

Although overall analysis showed MedSims VPS to be very effective in educating physicians, analysis of the prescribing function demonstrated an unexpected underutilization of the Prescription Pad—an important aspect of real life patient care and management.

By applying iterative improvements to the VPS, utilization was improved through addition and optimization of an Orders Helper. This in turn brought the learner’s experience of MedSims in closer alignment with actual clinical practice. These results highlighted the importance of close examination and analyses of all aspects of the virtual patient visit, to both identify unexpected deviations from expected user patterns, and also to continue this iterative process of refinement.

This study supports the use of a similar iterative process involving repetitions of the cycle of data analysis—introducing small changes and analyzing the impact of those changes is an effective way to optimize functional capabilities of VPS environments—has been implemented as part of the redesign of numerous features of the new MedSims platform.

REFERENCES