Interactive Learning Assessment: Providing Context and Simulating Professional Practices

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Abstract: Disciplinary practices are challenging both to teach and assess. Interactive Learning Assessment (ILA) is an online assessment that allows learners to take on expert roles—e.g., dietitian, genetic counselor—and learn content as they counsel virtual clients or patients. This poster presents results from a Fall 2012 pilot test with undergraduate students in a nutrition program (n=15). Students completed the ILA in 2-3 hours and reflected on the experience. Analysis reveals that students enjoyed learning about counseling in this manner, and that ILA allowed them to learn disciplinary content and practices—in this case, a professional nutrition counseling practice called ADIME.

Introduction

Interactive Learning Assessment (ILA) allows students to try on a professional identity while learning disciplinary content and practices, and also provides instructors with data about student learning. In previous research on ILA cases (Svihla et al., 2009), high school students were placed in expert roles such as genetic counselor or conservation geneticist and asked counsel virtual clients using resources, including the internet, to prepare responses. We contrasted ILA with traditional assessments, finding that the traditional assessments yielded an impoverished view of student capabilities. Students sometimes selected a correct answer on the traditional assessment, yet could not articulate a reason for their choice. In contrast, ILA revealed deeper information about students' ideas, including misconceptions they held. The advantage of revealing misconceptions in ILA is that they may be addressed adaptively by the assessment or by the instructor. ILA allows students to try on professional roles (e.g., dietitian), use resources (e.g. journal articles) and apply conceptual understanding by counseling virtual clients, such as a patient with diabetes. ILA helps students see connections to their future professional selves. ILA are formative, meaning they are designed to provide feedback and encourage further learning (Black & Wiliam, 1998) and focus on both content and skills, while incorporating required professional orientations, such as ethics. Research on simulation games such as ILA has shown the importance of active over passive approaches, the opportunity to revisit the simulation, and the benefit of combining such a simulation with other instruction (Dede, 2012). Likewise, ILA – like other successful approaches-- embeds academic content in situations, providing contexts for students to try, and if they fail, get useful feedback, enhancing their participation (Hickey, Barab, Ingram-Goble, & Zuiker, 2008). One of our goals is to "place disciplinary engagement in rich contexts" (Gresalfi & Barab, 2011, p. 301), allowing students to move beyond what Gresalfi and Barab term *procedural engagement*, in which students use "procedures accurately, but not necessarily with an understanding of why one is performing such procedures" (Gresalfi & Barab, 2011, p. 302). Instead, we desired for students to understand why this professional practice—ADIME (Assessment, Diagnosis, Intervention, Monitoring and Evaluation)—is important for dieticians and their clients, and to be able to make relevant professional decisions about its use; this is termed *consequential engagement* (Gresalfi & Barab, 2011).

Methods and Participants

This study reports a first iteration of a longer design-based research project aimed at refining technologies for learning and building grounded, localized theory about engaging students in professional practices as a means to support learning of both disciplinary content and practices. Our interdisciplinary team includes expertise in nutrition, learning sciences, and computer science. We designed a first case for use in an undergraduate course focusing on nutrition through the life cycle. The case provided students an opportunity to learn both the ADIME practices, and to learn about specific nutritional needs for a child with Down Syndrome. Students (n=15) completed the case out-of-class, then completed a survey. Data also include three exams, one given one week after the ILA was completed; a subset of questions from this assessment serve as a delayed post test to the ILA. Because of our small sample size, we do not report statistical test results, but rather focus on trends and particular student responses.

Results and Conclusions

Nutrition students reported that on average, they spent 2.5 hours. They overwhelmingly reported that they would use what they learned in other classes and in their careers, and that what they learned was important for their future professional work. Students also agreed that the case resembled a real life situation, though one nutrition student noted that the "Client was very compliant. Would like practice dealing with patients that are not as willing to change." Most students felt confident that they mastered the content of the case. One nutrition student explained, "I liked that I had to think about my responses but then after I submitted my responses I got to see how the instructor interpreted the data (as she has more experience than I do in dietetics). There was a lot of information provided but it was a nice way to learn because I was actually interacting with the information instead of just hearing it." Students were able to make use of feedback, and appreciated the formative nature of the ILA, "I liked that the case study reassured us of our answers and made us feel like there were no right or wrong answers. This helped me to really think about the questions instead of focusing on whether or not I would get full credit for being right." We believe the feedback provided to students helped them. For instance, a student chose an incorrect answer when asked which interventions should be suggested, ("Decrease portion sizes drastically (cut all portions in half) to induce rapid weight loss (3-4 pounds per week for a month).") but received feedback on how a professional nutritionist would respond, "Drastic weight loss is not healthy for people of any age, and if we drastically cut portion size, John will likely have inadequate vitamin and mineral intake, which can create other problems." Students who chose incorrect answers on the ILA still performed well on the delayed post test. On the delayed post test, the average score was 98% for items related to ILA. In contrast, the average score for items targeting traditional (paper-based) cases was 89%. While not a large difference, this suggests that students may retain what they learn in ILA better than traditional approaches. However, not all students appreciated learning in this manner; most of their coursework is presented as lectures, meaning the ILA was a very different approach for them. One nutrition student commented, "I did not like having to search through research articles in order to find information that we needed to interpret lab values. Maybe summarize or synthesize the articles into smaller documents so they are easier to interpret and do not take such a long time. I also found it very difficult to keep track of all the information without taking notes." This response suggests that as we increase our use of ILA in the nutrition program, we made need to be more explicit about why these activities—searching through articles and making notes about a case—are so important and a part of professional practice. However, other students desired to be pushed to do more, "It should encourage more independent research, not just suggest that 'you can do more on your own if you want.'" We note a tension between providing students with specific (often hard-to-find) resources and providing them opportunities to learn to locate resources on their own, a focus of our on-going design experiments in fostering *productive disciplinary engagement* (Engle & Conant, 2002).

References

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