Trends in Instructional Design

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Imagine that you are sitting on a bench by the shore of a small pond in a suburban area. As you eat your lunch, you can hear the sounds made by the denizens of the pond, in particular the croaking chorus of bullfrogs. Although the frog's sound has been familiar to you from cartoons since you were a child, you stop suddenly in your tracks and wonder, "Why exactly do frogs go 'ribbit'?"

You pull out your tablet and ask it, "How do frogs talk?" You click a link to a likely site and read the text of how a male frog inflates his vocal sacs and forces the air out through his nose and mouth. Intrigued, you decide to pursue more knowledge. Since you are not dressed for wading into the pond to catch a frog, let alone to determine whether it is a male, you open a video of a frog croaking.

The video is interesting, but it leaves a gap in understanding: what structures in the frog's body create the distinctive croaking sound? You scroll through some other page titles, finally stopping at "Virtual Frog Dissection." Fortunately, the wifi is strong by this pond, and you find yourself front and center at a detailed dissection and analysis of the internal systems of a frog.

Screen shot of McGraw Hill Higher Education Virtual Frog Dissection Lab. (See Reference list for URL so that you can try the simulation yourself.)

Wow, this is great! Too bad the mosquitoes are biting and you've got to run—it would be neat to see if there is a site that lets you control the cuts in the dissection, like a virtual game of Operation™!

This scenario illustrates some of the trends in instructional design that have been accelerating in recent years. First, the ability of learners to access information when it is needed, using browser-based resources, is driving many of the changes in education. Second, great quantities of information are becoming accessible in multiple formats—text, audio, video, simulation—adding flexibility to the learning experience. Third, educators who use digital resources are being provided with masses of data about learners that not only helps them evaluate students' mastery of the topics, but also how well particular teaching strategies are working.

Interactive Learning

As the frog dissection shows, anyone with an internet-connected device can gain extensive knowledge and experience about most any topic. For elementary students studying addition and subtraction or corporate employees taking advanced certification classes, learning resources are readily available. In fact, in many cases too much is available, making it difficult for learners to pick and choose between what is useful and what is not. Smart instructional designers recognize the need to help educators and students navigate the oceans of information to produce the best learning outcomes.

Interactivity is one of the cornerstones of the new approach to learning. This includes not only the use of online resources, but also face-to-face involvement in projects with other students and educators. As interest in blended learning has grown, the efficacy of such programs has been studied by an increasing number of educational experts. Studies dating back more than a decade show that classrooms blending lecture, group study, and online aspects produce students who are more involved in their own education and more motivated to learn, resulting in higher achievement. (See for example Means, et al., 2013.)

The kind of interactivity may take many forms. It can be as simple as an entire class spending part of the period using devices to do research for individual projects to rotation among online, teacher-directed, and group discussion stations. It can involve individuals progressing through online content with the help of interactive worksheets that send the individual down certain avenues depending on particular responses. It might involve a group accessing different content about a topic and posting their findings and links to the group message board or Twitter conversation so that all of them can understand. To a greater or lesser degree, the participants in each of these situations are taking charge of their learning.

Simulations

One trend getting a great deal of interest is learning through simulation. This mode of learning takes advantage of concepts and techniques popularized by the oft-maligned (by many parents and educational professionals) gaming industry. These resources use high-definition video and audio, animation, and

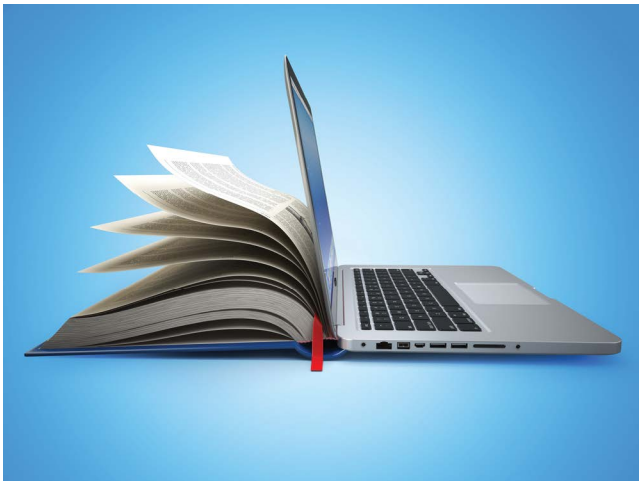
branching strategies to virtually place the user inside the desired experience. The frog dissection site referenced above is one example of this sort of learning.

Another such program is the American Heart Association's HeartCode® Basic Lifesaving course, which many health professionals and emergency personnel take periodically to maintain their certification in basic lifesaving. The AHA describes this course as a "Web-based, self-paced instructional program that uses eSimulation technology to allow students to assess and treat patients in virtual healthcare settings. In this environment, students apply their knowledge to real-time decision making and skills development." The online simulation can replace the classroom course at a significant cost and time savings.

The description of the HeartCode® course also says that "briefings and coaching are provided immediately after each simulation to facilitate learning." This interaction, even though with a digital trainer, is a key element, and something that sets this course apart from simple simulations. Learners have their work evaluated, and then can review topics and procedures in which they performed poorly. Virtual learning combines with immediate assessment and feedback to produce a better-trained professional.

Big Data

Designers understand the uses of the voluminous data that the digital world can provide about their products and their



customers. This is no less true for instructional designers. The best instructional designs incorporate assessment and data collection into their educational products so that feedback is helpful and time-sensitive for the learner as well as for the developer.

The computerization of standardized assessment has been advancing for years, and so has the merging of education and assessment. One of the most widespread examples of this are online safety courses for drivers who wish to pay less for their auto insurance. Each section of the course concludes with a multiple-choice quiz. The assessment occurs when the learning is fresh—and test-takers even have the chance to review the material if they get questions wrong, and then retake the quiz. At the end of the class, a certificate of completion is automatically sent to the insurance company since that information was input at the start of the course. and with it has come the ability to understand the areas in which each student has attained mastery or needs remediation.

The reason digital driver safety courses work so well is because their main purpose is to produce better drivers who are more aware of the state's motor vehicle laws and regulations. Insurance companies depend on these courses (and the lure of lower rates) to drive reductions in insurance payouts they have to make because graduates of the courses have fewer collisions.

Such accurate and timely use of data is a key to effective instructional design:

- **For learners:** As the driver safety course example shows, learners can benefit from assessment with immediate feedback. This reinforces their knowledge of the subject, tells them where their understanding is weak, and puts them on the path to mastering the totality of the subject.
- **For educators:** Educators use data to see where their students are on the learning continuum. This allows them to tailor remediation, review, or enrichment to individual students. It also makes it easier to quantify the mastery that their students have achieved and to adjust upcoming instruction to fill gaps and prepare students for high-stakes assessments.
- **For designers:** Designers need constant data inputs to evaluate the efficacy of their instructional products. If a particular strategy works well with a certain audience, the data can help determine why it is successful. Conversely, if students are not responding to certain strategies, the data will help designers reconstruct the material.

Personalized Learning

Perhaps the most far-reaching instructional design trend is the ongoing shift from one-size-fits-all learning to personalized learning. With personalized learning, individuals

- take responsibility for their own learning.
- have the tools to learn most effectively.
- choose avenues of exploration and experimentation.
- self-assess to enhance learning.

Technology is a primary feature of personalized learning, as without instant access and feedback such learning is difficult to sustain. Yet despite the emphasis on the learner, instructional design is still of utmost importance. The designer provides the initial guiding hand so that the individual can find appropriate materials and fit them into the course of learning. The designer also figures out the pathways that the learner can take and the knowledge nodes that must be covered in order to attain mastery of the subject.

Look again at the frog dissection simulation. The navigation bar shows eight separate systems that the learner can experience after the initial cut. The learner could start at the beginning of the simulation and follow it through to the end. But what if the learner just needs a refresher for one or two of the systems? By clicking on each system's button, the learner can go directly to the information needed. And once in each system, the learner can use the fast forward and backward arrows to find and review the precise data desired.

The learner can also pause the simulation and pursue related questions on different web pages. Then, by toggling between pages, the student can enhance the learning provided by multiple sources at the same time. If working as part of a team, the learner might tweet new realizations or connections to teammates (#frog_dissection) or start a comment strand on the group's digital blackboard. And this learning can go on inside a classroom, during study hall, at home, or while sitting on a park bench eating your lunch.

Conclusion

Web-based interactive learning can be a flexible and cost-effective alternative to traditional classroom learning, but it can also be a waste of time and money if implemented poorly. Despite the whiz-bang nature of new technology and strategies, sometimes the most effective learning is achieved through time-honored techniques. Good instructional designers understand that the best curriculum is the one that takes elements of all styles to meet the needs of the various stakeholders in the education process: learners first, then educators, and then the institution.

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