The Evolution of Scenario-Based Learning

Estelle Domingos, Capella University
Justin Lee, Capella University

Abstract: Scenario-based learning is a technique intended to engage and motivate the learner by immersing them into authentic situational contexts to allow them to practice skills prior to mastery. Follow along as we explore the iterative process of Capella University's Course Media team through their six years of designing, writing, and developing a handful of gameful, scenario-based products. Through this, at times, messy process, how their approach becomes subsequently honed and redefined is captured, along with a summary of key takeaways to consider for the success of others embarking along similar paths.

Capella University is a competency-based online university delivering bachelors, masters, and doctoral degrees, as well as non-degree certifications. As an online university, we have a unique opportunity to integrate interactivity into our courses for adult learners. We, the Course Media team, create games and other interactive media that simulate authentic real-world professional experiences. Since 2010, we have been honing our approach towards game-like, scenario-based learning and with each iteration, we have been gaining valuable insight.

Seed

Our vision is to develop engaging, effective learning experiences for our online learners in an increasingly efficient way. At Capella, we have spent the better part of a decade making interactive media (over 13,000 pieces), and up until 2010, most were standalone pieces supporting a single unit or course. Often the pieces were narrowly focused on terminology and knowledge retention. Only a small minority of pieces tackled complex concepts or presented fictional case studies. We knew the capabilities of media were growing in tandem with learner expectations, and we knew the value of interactivity in engaging learners and making learning stick. We were in need for an opportunity (think "funded project") to stretch our interactive capabilities into the forefront of interactive learning.

Figure 1: An example screen from Riverbend City.

An opportunity arose with the formation of the School of Public Service Leadership. This new school had undergraduate and master programs, including public safety, public administration, public health, and nursing. Its leadership was looking to differentiate the school's programs with an emphasis on using an interdisciplinary approach. And, this request came with budget. Suddenly, our lens became creating media from the perspective of whole

programs across the school. This new challenge was the moment the idea of creating a game-like scenario using a reusable overarching storyline was born.

What did we create? The storyline revolved around a train derailment and chemical spill in fictitious Riverbend City (see Figure 1). In each course, learners approached the storyline in relevant ways; for example, scenarios (dubbed “missions”) in public health courses focused on citywide chemical health problems related to the spill and its fallout. Within each mission, the learner ventured to different places in the city and observed conversations revealing multiple perspectives and approaches to solving a variety of problems. Our illustrators drew almost 400 characters, dozens of scene locations, and a city map. A custom Flash framework was built to empower designers to create pieces with little to no development needed, and they eventually churned out over 110 unique missions across dozens of courses.

Sprout

In 2013, a similar opportunity presented itself. A master’s program in Human Resource Management was being developed, and stakeholders were looking for a similar approach to Riverbend City. Three years had past and many of the facets of this original approach needed to be changed dramatically. Through needs analysis discussions, it was determined that for these new scenarios to be truly valuable, the learner needed to play a more active role. They also needed to be directly tied to course assessments. It was time to rebuild from the ground up, this time using web standards (HTML/CSS/Javascript) for the technical framework, and a first person approach to the content and interactivity, allowing the learner to play a dynamic role through the discovery of information.

Figure 2: An example screen from CapraTek.

This project had a rough start. The project stakeholders found it quite difficult to visualize what the final product would look and act like, as well as initially see the value of such a integrated series of pieces in their courses. It took nearly three months of discussions, wireframing, storyboarding, and prototyping before we received their tentative trust to begin development of the pieces and ultimately deliver a valuable product that satisfied their needs.

CapraTek, a fictional technology company, was created including nearly 100 characters, giving learners an intimate view of the inner workings of a human resource department (see Figure 2). We created 19 activities for 9 courses. Learners progressed through different tenuous situations in which learners needed to make decisions about who to talk to and prioritize which questions to ask. Some limited branching interactions were introduced, as well as, simple decision points with feedback. After completing an activity, the learners then brought this information into the course room and were asked to discuss their insights and write recommendations for the various

problems that were presented within the CapraTek activity.

Bloom

Because CapraTek was successfully launched and accepted as a viable approach for differentiation, two new products after a similar product built further momentum in 2014. The master's program for Leadership in Education Administration and the master's programs for Nursing and Healthcare Administration Informatics emerged at the same time, and now having a stronger codebase from CapraTek, what we've called the "Capra Engine", we initiated the process once again.

Having reflected on lessons learned after the CapraTek project completed, this time around we required upfront commitment from business stakeholders to limit indecision and keep the project within scope. Their response came in the form of firm backing and trust, which allowed more time for streamlining our processes and development. We documented our approach and best practices, using scope and design documents to be more systematic and transparent about our plans and set expectations with the stakeholders. With this new demand our code needed to evolve, building upon it to be more modular and reusable. This CapraTek codebase was forked for each of the projects and developed upon simultaneously for each project due to tight time constraints… the impending course launch.

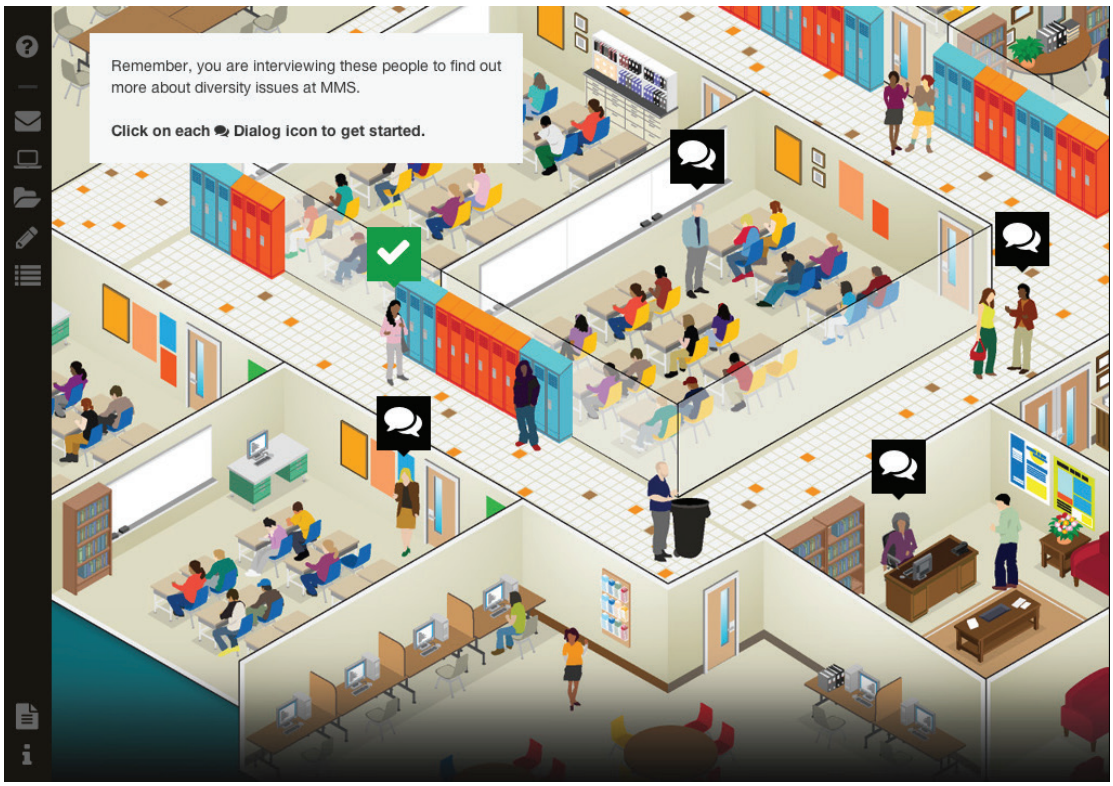

Figure 3: An example screen from Blooming Park.

Blooming Park School District is a fictitious district located in a large suburb of a major city and is brimming with diversity (see Figure 3). This setting provides our learners experience critically thinking through a variety of diversity related issues that they may not have been exposed to in their previous work experiences. This is extremely valuable, as these learners are aspiring principals and assistant principals. The Blooming Park simulations are designed to give learners the opportunity to investigate the current state of a school and take the information gathered to create recommendations for improvements. We increased the game-like experience by incorporating more complex branching, detective-style exploration scenes and also included a minigame titled "Closing the Achievement Gap" in these simulations. Currently, we have created 8 pieces in 3 courses, with plans for more activity development in the future.

VilaHealth is a system of health in a major metropolitan area, including hospitals, clinics, specialty services, etc (see Figure 4). Even in a time of modern technology, VilaHealth itself is not a perfect system. With plans for growth and expansion, it has just acquired two smaller systems of health in more rural locations. Consistent changes in government regulation (Meaningful Use), hospital and health system interoperability and interfacing, the desire to make data driven decisions and improve efficiency and patient health, make for a complex, often unclear industry.

This is what becomes the learner's playground. VilaHealth pieces, or "challenges," give context to the assignment within the course and set up a specific real life situation. In the challenges, learners gather information in an authentic way: learners interact with and interview key hospital personnel, and request or receive hospital data, demographic data, technology needs, etc. Learners take this information analyze it using critical thinking (what's valuable/what's not), document their findings, make decisions and recommendations based on the situation in their course assignment. In total, 24 VilaHealth challenges are used in 8 courses.

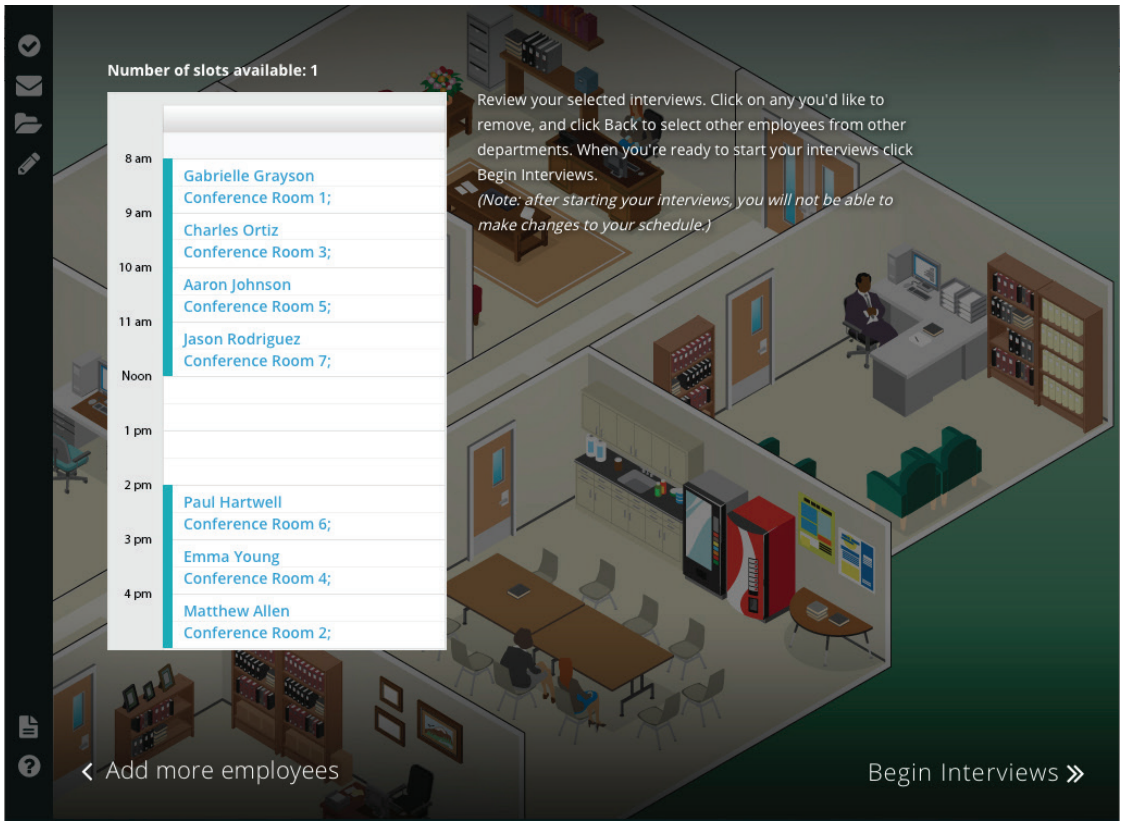

Figure 4: An example screen from VilaHealth.

We were more forward thinking during development by planning for the creation of new features like greater branching, quantifying choices into categories with more robust point and feedback structures. However, we did not have enough time or find an appropriate scenario opportunity to implement these new ideas.

Gameful Considerations

Because we work with adult learners, our approach to games cannot be superficial. There are some different considerations for adult play vs. K-12 play and learning. What does that look like? For us it involves putting learners in the role they desire to have and using stories and characters to create this environment for them to play and practice in (pg. 28, Enders, 2013).

There are intentionally limited superficial rewards given during our gameplay, because adult learners are not as motivated by these. Their motivation is in the eventual reward—the "A" they receive, or the corrective feedback given by faculty or peers. Learning and striving for that a-ha moment is their goal, culminating in their achieving preparedness for their desired profession or career advancement. Our scenarios also allow adults to apply their previous knowledge while filling in any gaps they may have (pp. 64–68, Holton, Knowles & Swanson, 2005; Kapp, 2012).

Cultivating the Garden

We plan to continue building upon our existing framework by adding further complexity and depth to our interactions. We want our learning experiences to be more meaningful and also become authentic assessments themselves (having scores be their grade).

It is our goal that the content and learning be so engaging that our learners try to succeed, try to fail, and experi-

ment (pg. 58, Renaud & Wagoner, 2011; pg. 29, Enders, 2013). By enhancing the game-like qualities of our scenarios we hope to elicit the idea or feelings of play: pretending, make believe, low risk, failing safely, practice and simulation. We want to learn about the patterns of play and exploration that our learners are using through the use of data tracking and learner feedback and then revise our experiences based on our findings.

Another major goal for our team is creating efficiencies in our process. We want to combine our current 2 codebases into one streamlined engine (taking the best of each) that will allow for faster development and allow more runway to accomplish more in-depth script writing and visually rich designs.

Another area of efficiency we are working on is our overall process. We would like to document more about our process and our capabilities, move ideation and decision making even earlier in our media design process to allow for longer development time and create additional prototypes for more sophisticated features. Finally, we would also like to make our assets more scalable, such as the creation of a character generation tool to put power in the hands of the content producers and reduce our role as the middleman.

Some ideas we would like to further explore and analyze more in-depth within our learning experiences:

- Throwing players into an intense situation or crisis,
- How reactions and choices impact multiple viewpoints,
- Gathering and prioritizing the most valuable information,
- Increasing critical thinking,
- “Gray” areas in decision making, not always a right or wrong,
- Represent the complexities of the professions we are training learners to perform in.

Key Takeaways

1. Choose a technology that is flexible and supportive

It is paramount when creating any large and complex gameful learning experience, or any technology-based solution, to build it using a technology that supports growth and iteration. It is also important that your team is already familiar with this technology—choosing a new or trendy technology can be very risky. Also, leverage existing technology where appropriate. For example, for our revised scenario framework, we have integrated MediaElement.js for audio and video delivery, FontAwesome for customized vector icons, and jQueryUI for interactive form elements.

2. Test, reflect, explore

Whenever you start something new, try to start small. Create a prototype that you can test to gather feedback. Improve your prototype based on the feedback, and test again. Continue iterating as you progress with your project further honing it into the best it can be. And gathering feedback doesn’t end after you launch your product, but you should instead develop a plan to continue gathering feedback. Then, reflect on how well your product meets your objectives. Gathering outside perspectives on similar projects can be insightful, so be sure to explore what others in your industry are doing to solve similar problems.

3. Understand your audience

This takeaway seems pretty straight forward—and part of it is. An intimate knowledge of the user of your product early in the process can allow you to make better and more informed decisions that benefit of your end product. But an audience that can sometimes slip by unnoticed are those you are working with or for. These are the stakeholders who have invested money, time, or reputation into your product, and are partially responsible for guiding the direction of the product. Understanding their perspective, their expectations, and their communication style with can sometimes be the key to a successful product and process.

4. Get involved in the process early and often

As a maker, try to get involved in foundational conversations early and every chance you can get. A knowledge of instructional design approaches, how to tell engaging stories, ability to synthesize gameful designs, and understanding content delivery options can help drive towards a successful product direction. Establishing this direction from the very beginning instead of after a poorly derived direction has already been set in motion by “the powers that be” allows for the development of a more holistic perspective and approach for the product and the creation team. Benefits include better group dynamics, creation of a shared language, and time and resource savings.

References

Enders, B., (2013) *Gamification, games, and learning: What managers and practitioners need to know*. Santa Rosa, CA: The eLearning Guild Research. Retrieved from http://www.elearningguild.com/showfile.cfm?id=5075

Holton, E. F., Knowles, M. S., & Swanson, R. A. (2005). *Adult learner: The definitive classic in adult education and human resource development.* Burlington, MA, USA: Routledge. Retrieved from http://site.ebrary.com.library.capella.edu/lib/capella/reader.action?docID=10127916

Kapp, K. M. (2012). *The gamification of learning and instruction: Game-based methods and strategies for training and education*. San Francisco, CA: Pfeiffer. Retrieved from http://common.books24x7.com.library.capella.edu/toc.aspx?bookid=46257.

Renaud, C., & Wagoner, B. (2011). The gamification of learning. *Principal Leadership*, 12(1), 57-59. Retrieved from http://search.proquest.com.library.capella.edu/docview/884032953