Designing Simulations for Authentic Learning

Capstone Project Analysis: T127 Teaching and Learning Lab Practicum, Fall 2022

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In collaboration with the Teaching and Learning Lab (TLL) at the Harvard Graduate School of Education and my partner Lauren Jensen, I developed, user tested, and piloted a simulation of a Learning Design Kick-Off Meeting. Dr. William Wisser, Director of the TLL, served as our Subject Matter Expert (SME) and guided our design process.

The TLL had been approached by Prof. Irvin Scott about using role-based simulations in his own courses, specifically with the platform Viewpoint. In order to better advise faculty on use of Viewpoint, the TLL decided to run a pilot using the platform. Previous T127 students (Sabina Zacco and Alessandra Lopez) had conducted a literature review investigating effective simulation design and performed expert interviews with faculty at HGSE who were already using simulations in their classrooms. They also created empathy maps, drafted a preliminary script, and designed a first iteration of the simulation in the Viewpoint platform.

For the pilot, we ran four concurrent simulations (two in-person and two virtual) of a TLL Learning Design Kick-Off Meeting lasting an hour, followed by a 15 minute group debrief.

I. Audience

We had a specific audience of 20 graduate students enrolled in T127. More broadly, this simulation targets adult learners pursuing a career in Learning Design.

II. Learning Outcomes

- **Engage** with a real-world scenario (migrating higher ed course content into an online class platform) that a learning designer might face in practice
- **Develop** an understanding of different roles & responsibilities and the collaboration dynamics across stakeholder groups in a learning design consultation meeting
- **Grapple** with some of the common challenges in a learning design kick off meeting, including:
    - Points of tensions across groups & their individual priorities
    - Timeline constraints
    - Scope creep
    - Translation of pedagogical best practices research into practice
- **Collaborate** with others and address these challenges in real time
- **Deal with and manage** authentic points of tension and respond appropriately
- **Actively reflect** on their takeaways and emotional reactions

The main learning outcome we hoped would come out developing an understanding of the collaboration dynamics is that a Kick-Off Meeting is *primarily about establishing trust and building a relationship* between the stakeholder groups. This was a recurring theme mentioned in expert interviews conducted by my partner Lauren Jensen and helped guide the evaluation instruments Lauren developed.

III. Learning Theories and Instructional Design Process

Authentic Learning

In constructivism's second wave, there was a movement to "situate" cognition in "authentic" contexts. (Petraglia, 1998) Situated cognition is thought to encourage transfer as the conditions under which the learner constructs new knowledge more closely match the conditions under which that knowledge should be applied.

The terms "situated learning" and "authentic learning" are sometimes used interchangeably.

Collins defines situated learning as having learners "carry out tasks and solve problems in an environment that reflects the nature of such tasks in the world." (2005)

Schaffer and Resnick (1999) categorized four kinds of authentic learning, all dealing with alignment between pedagogy and an aspect of the educational experience:

1. Activities aligned with outside world
2. Assessment aligned with instruction
3. Topics aligned with what learners want to know
4. Methods of inquiry aligned with discipline

As our simulation is more concerned with the *alignment* of learning than the *environment* in which the learning takes place, authentic learning seemed the better fit.

According to Nachtigall's more recent review of authentic learning, the "goal for the design of authentic learning settings [is] to contextualize learning experiences such that learners recognize the value, utility, meaning, and functionality of the knowledge to be acquired, while promoting both cognitive (e.g., development of deep understanding) and motivational (e.g., development of intrinsic motivation to learn) effects". (2022)

The goals of authentic learning share similarities with Malcolm Knowles' assumptions about adult learners and principles of andragogy, including:

- Many adults return to education for practical reasons such as entering a new field. Learning should focus on issues related to their work or personal life.
- Adults are intrinsically motivated and already have life experience to draw on. Learning should be centered on solving problems instead of memorizing content. (Learning Theories, 2017)

In line with this, one goal in Chris Dede's work with AR simulations is "reaching a point where the work team can do *problem solving*. Workers' individual and collective metacognitive strategies for making meaning out of complexity (such as making judgments about the value of alternative problem formulations) are vital." (Dunleavy et al., 2008)

Our focus on authentic learning led to the following design choices:

- ✓ **Added two roles** to increase the alignment of the simulation with the real TLL (and to create an "observer" role who could provide feedback during the debrief)

- ✓ **Decided to run four concurrent simulations** rather than have a fishbowl where 15 learners watched five learners role-play the scenario, to allow *all* learners to engage in authentic learning and practice problem-solving
- ✓ **Changed the course curriculum** from "Brave Leadership" to "History 233: The World in the Twentieth Century" to increase authenticity of in-simulation materials (course curriculum and faculty intake) and draw upon background of our SME
- ✓ **Added a metacognitive break** where we hoped to encourage metacognitive strategies for problem-solving, as identified by Lauren's research

Cognitive Load Theory

Cognitive load refers to the amount of information a person can process in working memory at once. If a learning activity requires too much capacity (the load is too high), learning is impeded. Instructional designs should "optimize the use of working memory capacity and avoid cognitive overload." (de Jong, 2010)

Cognitive load theory distinguishes between intrinsic cognitive load (inherent to what is being learned), extraneous cognitive load (caused by instructional design), and germane cognitive load (imposed by learning processes).

While we were focused on introducing content that aligned real-world TLL kick-off meetings with for the sake of authentic learning, we were careful to minimize extraneous load. This was a constant balancing act that we discussed as a team and ultimately led to the following design choices:

- ✓ **Reduced and prioritized points of tension** with only one additional point of tension (or "curveball") introduced mid-simulation: the faculty member's vacation confirmation
- ✓ **Produced different faculty intake documents** for faculty and TLL to reduce the extraneous load of the faculty member who also had to prioritize reviewing their curriculum
- ✓ **Removed sections of faculty intake document** which were not directly relevant to the simulation scenario
- ✓ **Removed multiple resources** from Viewpoint which were not directly relevant to the simulation scenario

Learner-Centered Design

Human-centered design or learner-centered design (in the case of learning experiences) is "premised on empathy, on the idea that the people you're designing for are your roadmap…empathize, understand them, and bring them along with you in the design process." (IDEO, n.d.)

Learner-centered design is premised on rapid prototyping, in order to involve learners in the design process and iterate based on their feedback as quickly as possible.

"There's no substitute for the nuance and depth of insight" that user testing provides during the prototyping process. (Thomsen, 2013)

From the very start of our design process and despite an already tight timeline, my team set the goal to user test before running our pilot simulation. We were able to conduct a user test

with HGSE students recruited through social media exactly one week before our pilot. User testing resulted in the following design choices:

- ✓ **Streamlined pre-work**. We made several changes to make the pre-work easier for learners to digest and to get participants into Viewpoint faster where they could begin reviewing their roles, reducing pre-work steps from five to three.
- ✓ **Created summary emails with priority role information and resources**. We called these "Reminder to Self" emails since they were sent from the role to the role. They were scheduled to be sent right before the start of the Kick-Off meeting.
- ✓ **Prioritized resources for each role and linked in multiple places** rather than just in the Resources section. The prioritized resources were linked in both the newly created "Reminder to Self" emails as well as the role descriptions.
- ✓ **Added clarifying language and emphasized key information** about the TLL, Kick-Off meetings, private beliefs, and the in-simulation online course launch deadline

IV. Evaluation and Assessment

Authentic assessment involves stimulating, life-related tasks. (Sanghera, 2014) Simulations can be used for either formative or summative assessment, although there are many challenges associated with assessing by simulation such as the distraction of learning a new platform, anxiety around public speaking, and significant set-up costs in terms of time and resources. (Penn State, n.d.; UNSW Sydney, n.d.)

Our team was more interested in evaluating our prototype (and Viewpoint) than assessing learners in the context of T127's learning goals. However, the two are of course intertwined! Lauren created four instruments to help us answer the following evaluation questions:

(1) In what ways, if any, did participants feel they were participating in an authentic kick-off meeting? (2) In what ways, if any, did Viewpoint facilitate this experience?

Many of the items within the instruments are intended to compare participant behavior/affect in the simulation to behavior/affect identified in expert interviews with the TLL conducted by Lauren. Here we were looking for the authenticity in terms of "activities aligned to the real-world." (Schaffer and Resnick, 1999)

Focusing on just one learning goal, 8 participants (out of 14 who completed the post-survey instrument) mentioned trust or relationship-building on items that related to priorities for their role or the purpose of a Kick-Off meeting – a priority frequently mentioned in Lauren's expert interviews. We can say that at least some participants felt they were participating in an authentic meeting in this regard.

Table 1. Participant Mentions of Trust and Relationships Compared to Expert Interviews

Expert Interviews	Simulation Participants
[CL] My role "develops a relationship of trust with [new faculty members]... take the time to develop the relationship, have them see us as a solution partner, not there to tell them what to do. We're here to enhance what they're already doing, not fixing anything." [LXD1] "I'm not here to change what they do... relationship building…I'm on your side and will make sure the students love it " [LXD2] "Very focused on relationship building, getting to know FM, letting them get to know me, letting them understand our process and where they're at, understanding what they need " [LXD3] "Establishing relationships and building trust, asking questions, demonstrating I've put in the time to learn about the course ahead of time. ... so reassuring [faculty members] that you have done this before"	[CL1 - POST] "prioritising relationship-building and creating trust between the faculty and the TLL team:…we need to respect their expertise with the course content while also providing useful learning design recommendations and support with conducting the class online" [CL2 - POST] "building relationships with SMEs (reassuring the faculty member and addressing her concerns)" [CL3 - POST] "building relationships of trust" [LXD1 - POST] "to have a solid relationship with the professor." [LXD1 – POST] – "I made sure to introduce myself as an ally to the faculty both in my email and in person, shaking *his* hand and assuring him that we would be working very closely together on all 'deadlines' and meeting regularly and that this was a familiar process with pre-set steps that we are very comfortable using." [O3 -MCB] "Observe a sense of psychological safety and trust being built among the four parties" [PM1 – POST] "Building connections between stakeholders" [PM3 – POST] "It is also important to gain the faculty member's trust at this initial meeting. Each of us presented our expertise in helping the faculty member in the transition to the residential course, and we welcome them to contribute their ideas and insights. So I'd say we also have the trust by the end" [PM4 – POST] "established a positive working relationship" [FM1 – POST] "creating a trusty and comfortable working environment,"

If the simulation were to eventually be launched as a permanent learning experience in T127, the same instruments (or simply having the teaching team observe the simulation) could be used to authentically assess learner understanding of specific content.

V. Media and Technology

The media selection choice of using Viewpoint had already been made. We could have pivoted to evaluating a different platform or run a simulation without one. However, I was interested in picking up a project past the ideation stage and wanted to practice iterating on a project already in the development stage. Therefore, we chose to continue with the prototype that had already been created by our predecessors.

We did make some design choices about interactivity and technology:

1. Run two out of four simulations **over Zoom**
2. Edit relevant documents in word documents **in OneDrive**
3. Conduct pre- and post-surveys **via Qualtrics**

Everywhere else, we tried to prioritize having participants use Viewpoint's native functions whenever possible.

Looking at Viewpoint through the lens of Mayer's principles of multimedia learning, (Walsh, 2017) the platform provides the following affordances:

- **Segmenting Principle:** learners can pace their exploration of the roles and resources since they are organized across the platform, instead of in one continuous stream
- **Pre-Training Principle:** learners can take a "tour" of the dashboard by clicking the question mark to learn some of the basics

For our own choices, we employed the following of Mayer's principles:

- **Signaling Principle:** bold the most important text in Viewpoint
- **Coherence Principle:** similar to cognitive load theory, we tried to remove extraneous, distracting material in Viewpoint (such as extra resources)

As for how well Viewpoint facilitated learners' experience of a simulated Learning Design Kick-Off Meeting? Nine out of 14 of post-survey respondents agreed or strongly agreed with the statement "Viewpoint enhanced my experience and was not distracting." However, when looking at qualitative responses, participant responses were almost evenly split between positive comments (12 comments) and negative or neutral comments (11 comments.)

Table 2. How did Viewpoint affect your experience in the simulation for good or bad?

Response Type	Response
Strong Positive	"Loved Viewpoint, think it set up a beautiful structure for the simulation." [CL1] "This was a unique experience for me, and I think in an online context, Viewpoint could work quite well." [PM1] "I really enjoyed this platform for improving my experience" [FM1] "loved the messaging feature and the roles page." [LD2] "I really enjoyed the prework and the messaging feature." [LD2]
Mild Positive	"Helped understand my role and my team member´s role. As well as the objective for the simulation" [O1] "I liked Viewpoint" [PM2] "I like this platform. It's user-friendly and easy to navigate through as a first-time user" [PM3] "I think it helped me feel organized and clear on expectations" [CL3] "Overall I think it was good. It was my first time in the simulation and I felt the tension and uncertainty which I wouldn't have in a lecture." [LD1] "It was interesting using Viewpoint for the simulation" [PM4] "I can easily understand and access my role info and the documents." [O2]
Neutral	"It was an okay interface but nothing surprisingly good or helpful in improving the simulation experience." [CL2] "Neutral. It was an innovative tool that wasn't too difficult to navigate but I'm not sure it set apart my experience from any other simulation I've participated in (that solely relied on verbal instruction and simple handouts)." [CL4]

	"It was ok!" [FM2] "Viewpoint does not affect my experience to a great extent." [O2] "I've done sims without these pages (e.g., a 2 person sim that had just a 5 page single spaced narrative with details as my prep, and a separate one for my colleague) and can honestly say that they both were fine." [LD2]
Mild Negative	"I didn´t use it or my teammates during the simulation, just to answer the survey." [O1] "For me, I didn't know where to look for the information, so I found myself really poking around. After the simulation, one of my teammates commented that she didn't realize she had access to all of the information that we had." [PM2] "It was just a little bit uneasy when I needed to jump back and forth between slack for the instruction and this platform to explore, and it can be ignored." [PM3] "It was quite distracting having to access many different parts of the program to get information on our role etc" [PM4]
Strong Negative	"I do feel the roles (private beliefs) were crucial and it was hard to find." [LD1] "the survey was extremely distracting and broke immersion for me completely" [LD2]

Under the neutral comments, several participants indicated that they did not see the advantage of using Viewpoint over written documents outlining the scenario and roles. This resonates. From our team's experience of the design process, Viewpoint had many features that we were not able to use based on the short timeline of the Kick-Off meeting simulation. For shorter role-play simulations, Viewpoint may be under-utilized and not worth the investment of time and resources and/or the risk of learners becoming distracted/confused by the platform.

However, longer simulations over the span of a week or more could take advantage of Viewpoint's timeline feature and its asynchronous messaging and decision point features, as well as taking greater advantage of the queued content and announcements.

VI. References

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