Upside Down Exhibition

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Envision Schools were founded on best practices of school design, rigorous college-preparatory curricula, small and personalized learning environments, and a focus on measurable results. These goals are achieved within a project-based learning environment that emphasizes deeper learning and the integration of arts and technology. Envision believes that through focusing on rigor, relationships, and results, we can foster a vibrant learning community that can increase student engagement and empower students to succeed both in college and in life.

Envision participated in a Khan Academy pilot project after a successful collaboration during summer school in 2011. In this role we worked closely with the Khan Academy team to develop curriculum that integrated Khan Academy into our project-based environment. This was made possible through a generous donation of Chromebooks from Google that enabled us to provide access to Khan Academy, Upside Down Academy, and other web-based tools.

Upside Down Academy resulted from a partnership with Jared Cosulich

of Puzzle School and the Envison Schools. This Academy turns the school paradigm upside down, with students becoming teachers. By switching the roles, we wanted to foster a sense of urgency around learning and create opportunities for students to explore teaching and learning in a new way. Our goal was to incorporate this new tool into our ninth grade mathematics class at two of our schools.

Our project-based model provided an interdisciplinary learning environment that allowed students to construct new meanings and apply their academic learning. Leading educational theorist John Dewey (2009) described the nature of learning as experiential, that through exploring, thinking, reflecting, and engaging with one's environment, deep learning occurs. These projects strive to display student work and knowledge authentically. We call these projects "exhibitions of learning."

Algebra I is considered a gatekeeper to future academic success in both high school and college (Maccini, McNaughton & Ruhl, 1999; Harvey, Waits & DeMana, 1995). We felt challenged to create a relevant and rigorous exhibition that would support this core content. Building on this constructivist approach to learning, we strove to engage our students in their own learning process. That way, they could deepen their understanding of Algebraic concepts and their identities as members of a teaching and learning community (Anderson, 2000). Jonassen (1994) described the characteristics of a constructivist learning environments as: a) meaningful and authentic context, b) collaborative and social construction of knowledge, and c) thoughtful reflection on experience and meaning. These characteristics guided our project design. Through this process, students would have the opportunity to publicly share their knowledge, which we hoped would foster authentic dialogue about their thinking. We also expected that this sharing process would lead to deeper self-reflection by the students.

The Process

Once the prototype of the website was constructed, we piloted the process with a group of four students who volunteered to work with us after school. We introduced them to the concept of the site simply. We stated that this platform offered them an opportunity to demonstrate their understanding by teaching a short video-based lesson on a math concept of their choice. We decided to constrict the parameters to

mathematics because we wanted these demo lessons to act as possible work samples for the larger project.

The students spent an afternoon working on their demo lessons. They first identified a concept that they knew well. After that they storyboarded and filmed their videos. Although they collaborated on the process, each student ultimately created his or her own video. On the second afternoon, the students uploaded their lessons to Upside Down Academy and completed the supporting narrative. Finally, after their video tutorials were shared by their teacher in a regular math class, we spent an afternoon reflecting with the students on the entire process.

This pilot revealed that identifying a concept to teach was easy for the students. The process of storyboarding offered students the opportunity to think creatively about how to teach the concept. In all cases, however, the pilot lessons took a similar format. In three of the four videos, students stood in front of a white board and talked the viewer through the algorithm while solving the problem.

Two types of reflections emerged: practical and pedagogical. The practical concerns related to physical experiences in both the production and viewing stages. Some of the production observations students made involved lighting, blocking, being prepared with the correct numbers at each step of the solution, being audible, and using the correct vocabulary. Pedagogical concerns related to the teaching and learning process as well as teaching strategies. For example, the students realized that simply teaching the steps to solve an algorithm might not always translate into a deep understanding of the concept. Similarly, students noticed that not all learners could access understanding through this type of medium. This pedagogical discussion brought to light the realization that students learn in different ways and that the job of a teacher is to provide multiple pathways toward understanding. The students who participated in this pilot agreed that being a teacher is difficult.

After the pilot study, we realized that we needed to further scaffold the process. The students' reflection about learning came only at the end of the pilot process, and we wanted to incorporate these reflective practices throughout the exhibition. As a result, we implemented some major changes to the next iteration.

The Exhibition

We began the exhibition work with a week of reflection. This allowed students the mental space to be thoughtful about their own strengths and challenges as learners. In their Digital Literacy class, the students took several learning style inventories and reflected on the results. They completed short reflections about the teaching strategies that they observed in all of their classes, especially those that supported their own learning styles. Meanwhile, the math teacher used several video-tutorials to explore pedagogical differences between the approaches. For example, the students watched video tutorials on Khan Academy and compared these to the video tutorials created during the pilot. A number of students identified that they preferred the use of different colors to denote different stages in an equations solution, as is the case with Khan Academy. Others preferred seeing the person teaching the concepts, and some students preferred video simulations void of narrative.

The students then worked in both their Algebra I class and their Digital Literacy class to identify an Algebraic concept that they wanted to teach, storyboard their video-tutorial, film their lesson, and then upload the lesson and supporting narrative to Upside Down Academy. This process was much the same as the pilot, except that the process was broken down into benchmarks. What differed greatly from the pilot was that students were given enough time to complete the cycle twice, which allowed for peer and teacher feedback to be reflected in their second video. Some students chose to use a new web-based whiteboard tool called "educreations." The videos were posted online to serve as a resource for their classmates.

This process of being accountable to the larger school community and the general public provided an authentic and powerful point of reflection for the students. Many students realized that these video tutorials were not simply serving as an assignment for their classes but also had real utility to their potential viewers. As their work became a part of the larger body of teaching and learning resources, students paid more attention to the detail and the pedagogical strategies that were used in their videos. As is described by Kerchner (2012), something about the "transparency of what students and teachers are up to that gives new meaning to public participation" and this meaning came

when students received comments on their lessons. Kerchner referred to web-based tools that facilitate what is termed Learning 2.0. This new structure for education is thought to meet the needs of our current society more effectively than the industrial model of the past, which does not prepare students for today's workplace. The experience of transparency and public participation was central to the success of Upside Down Academy and this Exhibition.

Conclusion

The increased and fluent use of technology within educational practice is indisputably a positive venture. Upside Down Academy provided students with access not only to general technology-based tools but also to specific tools for online video tutorials. Like many other Web 2.0 tools, this platform fostered a community of learners and utilized social media-like qualities of public commenting. These capabilities led to students' comments about how being publicly accountable changed their engagement with the material and their constructed sense of audience. Both the concept of audience and that of a community of learners are important foundations to developing an awareness of online presence and digital safety. These are concepts that are at the heart of improving digital literacy.

Students reflected about how the process improved their understanding of the math concepts that they taught. They attributed their improvement to a number of factors, ranging from public accountability to having to record their lessons multiple times. Students felt that they learned from each others videos and about themselves as learners. They articulated their strengths and challenges within a teaching and learning relationship and were able to discuss ways to facilitate and improve on work.

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