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Student-Created Content in WorldWide Telescope

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Abstract. Using WorldWide Telescope (WWT), the California Academy of Sciences used tour presentations created by Bay Area high school students. These students wrote, programmed, and presented their own fulldome shows utilizing WWT with the support of Academy staff. This allowed the students to create programs that were meaningful and interesting and to help determine the kinds of shows and content for future programs at the Academy. We present here our experiences and our goals for future programs.

1. What We Did

WorldWide Telescope (WWT)[1] has proven its versatility in astronomy education and visualization, but how can we do more with it? The California Academy of Sciences has facilitated the creation of tour presentations by Bay Area high school students. Students wrote, programmed, and presented their own fulldome shows utilizing WWT with the support of Academy staff. As an institution with a wide breadth of expertise on-site, and through professional connections, we were able to allow students nearly free reign in terms of subject material and allowed them to create programs that were meaningful and interesting to themselves, and hopefully to their peers as well. This secondary audience was important to us as well; one of our original goals was to determine the kinds of shows and content that they would select for their peers in order to create future programs that could incorporate some of these topics.

2. How We Did It

Our Digital Learning program brings in students from all over the Bay Area with a variety of ages. For the first *Science in Action: Astronomy*, we focused on high school students with some familiarity or interest in astronomy. About half had used a telescope to look at a celestial object and about a quarter had some kind of formalized astronomy instruction in a classroom. Eight of the ten had seen a planetarium show and they had all seen astronomy-focused programs on television. Our group wanted to make sure that we could facilitate and help to develop their interests as well as ensure that they received accurate information as they developed the critical thinking skills to see

[1] `http://worldwidetelescope.org`

through the abundant misinformation that seems to be a common element of some science-related television programs.

Over the course of a six-month program, our learners were able to come in approximately twice a week and one Saturday a month to develop their knowledge and background in the fundamentals of astronomy and presenting scientific information. After a brief post-school snack, each day began with an activity to get the kids into the right mindset. The activity focused around an astronomical topic (e.g., the life cycles of stars) or concept (distances) to allow them to interact during a lesson, give input and ask questions, conduct their own investigations, or create their own model or explanation. The latter hour would often be spent working together in pairs on our laptops, speaking to someone involved with their topic or show creation, or presenting here at the Academy. The Digital Learning team enhanced this time with activities, crafts, projects, and games to build the lessons. Our students then selected themes and developed presentations for their peers utilizing Academy researchers and experts.

During the last intensive month, final shows were created and presented to a mixed audience of the public and families of the students as well as Academy staff. The students were presented with the option of presenting within the Morrison planetarium main dome, our partial dome presentation space, Hohfeld Hall, or our semi-portable inflatable Elumenati Geodome. The students unanimously decided they would like to present using the Geodome, citing the intimate size and smaller audience as the main reasons for the choice.

At every step of the creative process, our students were driving the process, with the end result being three fulldome shows that were fully written, programmed and presented by our ten students. Each show was designed to be ten minutes long and have at least two presenters and one pilot. Ideally, we had planned on getting the students to a level where they could pilot the show and present the content, but that point was not reached in time by all the students.

3. What Came Of It

At the conclusion of the program we received very positive feedback from our students, underscoring their increased comfort with the topic and their ability to present information in a factual and professional manner. Each team presented their shows several times during and after the program and we have been able to further utilize the shows they have made for subsequent events like Family Science Night and Teen Evenings. Since WWT is so widespread, we have been able to show this same content in our main dome and in other portable domes, including the Houston Museum of Natural Science's Discovery Dome at the American Astronomical Society conference.

4. What We Would Do Differently

Ideally, we would expand this program in subsequent incarnations by working alongside other institutions with their own students. Collaborations with other institutions could also open our students up to a greater depth and breadth of experts in various fields. Having the benefit of student and professional experts that could be reached via video conferencing would enable students to get top-tier information, content, and experience from across the country or around the world. In a time when these institutions

may be having trouble getting approval for outreach, this could be an easy and cheap way of allowing passionate learners a window into the institutions.

Further developing our institution's familiarity with WWT and the rest of the WWT community is also a large potential benefit. We have also made contacts at WWT who would be able to coach us and our students in WWT in the future, allowing them to apply more professional tips and software specific tricks to ensure smoother (bug free) shows.

We would also like to further utilize the software by creating a set of lesson-based tours for the students to experience and then modify themselves. Developing classroom focused content with our students will not only allow us to refine and present our content in engaging ways but also allow our students to potentially bring this information to their classes as an expert and informal WWT ambassador.

5. What We Want to Do Next

In the future, we would like to extend this further and create classroom-focused and standards-based visualizations and tours for teachers and astronomy outreach educators to use, capitalizing on existing expertise of groups like the ASP and Project ASTRO to allow EPO practitioners to take rendered visuals and classroom-focused tours with them and distribute them to schools in the area and beyond. Creating a network of skilled content creators and programmers at schools and institutions will ensure that the coming generations can be exposed to these important and fundamental concepts in truly engaging ways.

6. Further Information

For anyone interested in learning more about the lessons and activities used in our program, the shows themselves, or the possibility of creating similar programs at another school or institution, please contact the author at `mroberts@calacademy.org`.