Possibilities in Science Workshop: C. Elegans Activity

Christian Steffen

University of Iowa
Project Narrative-

To start simply, the project began out of recognition that STEM participation is faltering at a time when said participation has never been more important. Forgetting all the data about our changing world and the consequences that those changes might cause; 2.4 million STEM jobs will likely go unfulfilled in 2018 (Smithsonian). How can we best combat this issue? Research indicates that the best route to go in combatting low participation/interest in STEM is direct involvement with STEM. A study by the University of Massachusetts Donahue Institution demonstrated that kids (k-12) who worked together under teacher guidance to answer specific scientific questions actually showed a positive trend for the likelihood of later choosing a STEM career (UMass). While it may seem obvious, the takeaway is that direct involvement with STEM is correlated with increased interest in STEM. With this in mind, I coordinated development of the Possibilities in Science Workshop- a student centered STEM seminar including hands on science activities, lab tours, and 11 of the high school students that participated in the workshop with the Latham Fellows.
informal science lessons delivered by volunteers. Therefore, the project rationale was combatting lack of STEM interest with direct STEM involvement.

As my goal for the project was increasing interest/participation in STEM, we targeted the age group that research shows is most susceptible to increased interest in anything—young high schoolers (ASPIRES). As a research study by Kings College in London shows, interest in STEM is largely unchangeable by age 14. Though my project included high schoolers of all ages—the majority were freshmen and sophomores.

Once I found that the research supported my overall goals and the routes to achieve them, I began the process of setting up the event. The host of the students was going to be Project HOPE, but after they moved their timetable the clear choice became Upward Bound. I reached out to their UofI director, Robert Richards, and found that he could only supply the kids to one Latham fellow at a time. Two other Latham fellows were trying to achieve similar goals with the same audience, and we teamed up to make the conference rather than compete for our target audience. Several meetings took place where Robert felt out the workshop and the routes we could take in its implementation. While this planning was taking place, the fellows and I reached a consensus that the event should have a hands-on portion, lab tour portion, and a free question/answer research “poster” session.
The first section of the workshop was hands on STEM. This first section was divided up into two parts. One was an epidemiology activity and simulation conducted by one of the three Latham fellows helping with the workshop. The other part was a *C. elegans* demonstration/presentation/competition that I designed. First I taught the kids about the worms as a model organism, why they’re so useful, and how I used them in my old lab. I then showed them how to move the worms and challenged them to move the worms while keeping them alive. I purchased candy as a reward for success and was pleasantly surprised to find that each kid successfully moved five live worms by themselves— with a little help from me.

The next section of the event was a poster session where various student scientists from across UofI presented their research in a come-and-go fashion. Students learned about physics, biology, and disease prevention during this time. Finally, after a recap and short lunch session we proceeded on the lab tours. The kids were split up and shown various biology and
chemistry labs across campus with student researcher volunteers to guide them. At the end we reconvened and passed out surveys with three basic questions asked as feedback.

Students learn about PCR from a Latham fellow during the poster session.

Students learn about the effects, treatments, and realities of cancer from Sarah, a Latham fellow, during the poster session.

Above we can see yeast grown in the shape of a Tigerhawk courtesy of Malkova lab-go Hawks!
When all was said and done my team and I reached a total of 12 high school aged kids and received feedback from all 12. Though the number of participants was lower than we were expecting, we still appreciated Upward Bound for supplying excited and engaged students. I would also like to thank the UI Department of Biology, the UI Department of Chemistry, the Malkova lab, the Neimann lab, and the Abel lab for their sponsorship of the workshop and support in the form of advice and physical lab space. Worms were provided by the Prahlad and Phillips labs as well and we couldn’t have completed the workshop without either labs donation.

Though the project was a single in-person event, there are avenues to take for replication of the project in the future. With yet another collaboration with Upward Bound, we see the partnership strengthen. Robert Richards assured my team and I that they become more appreciative of the program each time we connect. Using the feedback we received (they liked the hands on activities) future Latham groups could design even better live events than we did through incorporation of what went well in our workshop and through the avoidance of what didn’t (poster session).

Overall, I learned as much as the students did. There are, I believe, two important personal lessons to take away from the workshop. The first is that a subject is only as interesting or engaging as the individual teaching the subject. The kids were very excited about the worms because I was excited about them. They even went so far as to remark that they can’t believe
they were interested in something so dull. The second lesson is that in-person events will never go completely as planned and there must exist avenues to take to correct faulty aspects of the event on-the-fly. Thankfully, our project went extremely well. I can call my project a success because both the kids and I were more interested in STEM upon its completion- and that’s not always a simple feat.
*All included photos are courtesy of Upward Bound and their UofI director Robert Richards.

IDEAL INTERVIEWEE PERMISSION AND RELEASE FORM

I agree to be interviewed as a part of a student assignment through Iowa Digital Engagement and Learning. I also give permission for a video and audio-recording to be made of my interview. I further agree to be photographed as part of my interview.

I authorize the video/audio-recording of my interview and my photograph(s), including my name, image, and voice, to be used as part of the Iowa Narrative Project for educational, research, scholarly, and other non-commercial purposes of the University, including, but not limited to, exhibition, publication, presentation, and distribution in any medium and on the World Wide Web, and deposit in a permanent collection.

I transfer and assign to the University of Iowa any right, title, and interest I may have in the video/audio-recording of my interview and in my photograph(s), including the copyright and any performance rights, and any right, title, and interest I may have in any works based upon, derived from, or incorporating the recording or my photograph(s).

I irrevocably waive any right that I may have to inspect, edit, or approve the video/audio-recording of my interview in any of its forms as well as any such rights relating to my photograph(s).

I irrevocably release the University of Iowa, its employees, agents, and assigns, from any and all claims that I may have at any time arising out of or related to, the video/audio-recording of my interview or my photograph(s) or its/their use, including, but not limited to, any claims based on the right of privacy, title, or defamation.

Signature of Person to be Interviewed

[Signature]

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Name of Person to be Interviewed

Robert Richards

Director, Upward Bound Program
Works Cited


UMASS. “Increasing Student Interest in STEM.” *UMASS Donahue Institute*, 2017,