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Peer learning: a strategy for practical explainer training

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ABSTRACT: Peer training provides Explainers with the knowledge, skills and confidence to facilitate high quality interactions with visitors. These are skills that carry into their academic, personal and professional lives. Explainers report better grades in school, improved communication skills and better understanding of diverse learning styles. By devoting this high level of time and attention to this valuable resource, we can truly see the significant influence the science center can have on this most valuable, and often underserved, museum audience.

History of the Science Career Ladder

The Science Career Ladder (SCL) at the New York Hall of Science employs over one hundred and fifty high school and college students each year as Explainers, who are trained to provide exhibition interpretation, on-floor science demonstrations, group orientation, and workshop support for visitors. The program offers a graduated sequence of instructional, leadership and employment opportunities that strengthen communication skills, broaden science learning and provide career development for underserved elementary through college students.

The Science Career Ladder began in 1987 in response to the need for staff to interact with visitors within the newly opened exhibitions. The Hall hired young enthusiastic people to fulfill this need, and quickly realized that this entry-level job had great potential for career development. These “Explainers” began to unlock their potential as science educators, leading to a teacher preparation partnership with nearby Queens College. Students, many of whom were immigrants or first-generation Americans, received grants for university coursework while working part-time at the museum, as a means of increasing diversity among New York City teachers.

Over time, other “rungs” were added to the ladder. Veteran Explainers took on advanced roles as Program Explainers or Senior Explainers. Entry-level volunteer opportunities for high school students became available in the public programs department, which transition into paid positions in fundamental arts and visitor service roles. In 1997, an after-school program for Kindergarten through 8th graders was developed, adding a first step to the ladder.

While the program evolved through the years to include participants from outside of the science education field, the underlying goals remain the same. Through meaningful work experience, young people develop their communication skills, leadership capabilities and science knowledge that build confidence and expand their career opportunities. With frequent opportunities for growth and promotion, Explainers are motivated to improve their performance, take on new responsibilities and move into higher positions within the museum and beyond. When they move on, Explainers inevitably take with them an appreciation for science and a greater enthusiasm for learning.

Facilitator training

Science centers and museums create unique, engaging learning experiences that stimulate questions, encourage creative thinking, and expose visitors to science that is relevant to their everyday lives. While we

in the field know these things to be true, quantitative evidence supporting intellectual gains from brief and infrequent visitor experiences are limited.¹ If, however, we look to our most dedicated audiences- our own museum staff- we will be able to see evidence of the long-term impact that science centers can truly have.

“Given that more than 100 years of research documents the important roles of teachers in facilitating learning, it is amazing how little research exists on the role that museum staff- volunteers, guides, explainers, demonstrators, and performers- play in facilitating learning from museums”.² The Science Career Ladder program identifies youth volunteers and staff as an essential component of the visitor experience and one of its most important audiences. By emphasizing the growth and development of this internal audience the Hall ensures long-term impact on program participants, which in turn provides a higher quality experience for visitors. Although most Explainers come into the job without science teaching experience, on-going peer training provides practical engagement strategies and content necessary to facilitate meaningful visitor interactions.

Quite frequently in other institutions, on the job training can be brief and overwhelming. A much older, more confident supervisor describes the details of the phenomenon the new hire is attempting to learn.

“So, visitors will move these balls around and see Bernoulli’s Principle in action. You know what Bernoulli’s Principle is, right?”

“Oh yes, of course,” the novice nods, too afraid to let on that the concept was well outside of his or her realm of understanding.

“And with this activity,” the superior instructor proclaims,” you can talk about heredity, genetic mutation, co-dominance, and all that stuff.”

As most museum educators know, this is easier said than done. Science graduates may be fortunate enough to understand the beautiful nuances of the double helix, however imparting knowledge of genetics onto a hyperactive gang of ten-year olds can be a daunting task. While most informal science educators have had an abundance of synapse-firing science learning experiences throughout the training process (we must have or we wouldn’t be here) the first few years were likely filled with awkward and difficult moments. Clouded in vague ideas and weak analogies, too proud to say that the two-hour overview of concepts and functions was not enough, novice museum interpreters stumble through the exhibits, carefully avoiding the questioning glances of visitors.

“Visitors must be motivated and engaged if they are to learn and want to return. Motivation and engagement are the basic elements of effective education in all settings.”³ If museum staff members are to facilitate “motivating and engaging experiences” they must be trained using the same innovative, thought-provoking strategies that they are expected to use with visitors. While many museums create comprehensive programs for formal teacher training that use the most innovative methods of constructivist teaching, these resources are not being used toward the skill development of their own staff. Staff training must embody the philosophy of the institution: engaging, on-going, collaborative and constructivist in nature.

“In the truest socio-cultural sense, staff and volunteers are members of the community of learners themselves, a part of the community of practice we call the museum. They are also transformed by the interactions they have with visitors, in the same way that visitors are transformed and affected by interactions with them.”⁴ With this in mind, we must recognize the museum experience as a learning opportunity for the staff just as much as it is for the visitor, and capitalize on this opportunity to educate the educator.

The Hall of Science approach

The New York Hall of Science recognized that in order to truly fulfill the needs of staff and visitors, ongoing professional development is crucial. The Hall takes a holistic approach to explainer training, providing on-going professional development that empowers the staff to learn from one another and work together toward a common goal. Through weekly peer training sessions and numerous opportunities for promotion, Explainers are provided with opportunities to grow both personally and professionally.

Frank Signorello, who was a science instructor at the Hall of Science, championed the training method in the late 1990’s. As a classroom teacher, he practically applied collaborative learning strategies with his students, empowering them to work together and learn from each other. Now the Vice President for Professional Development, Frank recounts:

“Peer training was an idea I had to promote collaboration and cooperation among the Explainers. I wanted to create mini learning cohorts that would want to learn together and take care of each other. I also wanted to create a communicative environment on the floor so that we could be more hands-on and observe people using the museum.”

He also wanted to increase awareness of differentiated instruction, learning styles and multiple intelligences,⁵ by encouraging diversity in explanations.

“I wanted to empower the presenter as well as the rest of the team of Explainers on that training day to construct their own learning. I was hoping to get across this idea of being able to differentiate their teaching to a diverse audience of learners, which each training group embodies. At first I wanted the other Explainers to try to stump the Explainer who was presenting but that just made things worse... I then asked each Explainer to try and develop different styles of presenting by bouncing ideas off of their training group... I think they still do that today.”

Explainers participate in one hour of peer training each week. At the beginning of each semester, they are assigned to a trainer and a peer group of 6-8 fellow Explainers. The trainer is likely a former Explainer who has risen through the ranks to Senior Explainer or Science Instructor, and has years of experience working on the museum floor. This group works together for a twenty-week cycle, transitioning to a different part of the museum every few weeks. Each time they meet, group members are assigned one exhibit to study, research and rehearse on their own. The following week, those Explainers will take turns explaining their pre-assigned exhibit to the rest of the group. The group critiques the explanation and provides additional information, different approaches, or suggestions for improvement. The trainer guides the conversation, proposes different scenarios (explain to a five-year-old or to a group of teens) and interjects important details and big ideas.

By creating this small, supportive community of practice, trainers can provide a safe environment that promotes collaboration and cooperative learning. Through this process, Explainers are empowered to be the constructors of knowledge, rather than passive participants. The strengths of each Explainer can enhance the group and allow for more insight into how an exhibit may be explained, which diversifies the abilities of all group members. The trainer acts as facilitator of the process, but encourages the knowledge to come from the members of the group. Group members feel obligated to do well not for fear of poor marks, but because they are responsible for the learning of others in the group.

The training cycle takes one full semester to complete, with groups typically spending one or two sessions in each exhibit area. Focusing on just one exhibit area each week allows for more in depth understanding of exhibits and greater opportunity to see diverse styles and approaches. It reinforces the idea that learning is not finite, and that everyone- even the trainer- can continuously grow and develop. This process also provides an accurate and ongoing assessment tool, allowing trainers to see the progression of each Explainer over the course of the semester. Evaluations will be made not simply on performance and knowledge, but also on the individual progress that has been made.

There are, of course, challenges associated with the process. Without a scripted protocol, the onus is on the trainer (who may have limited exposure to formal educational theory) to guide learning according to the material presented. “We found that, left to their own devices, staff will focus on what is most important to them in leading team training. Therefore, training has gone through changes where historically leaders emphasized presentation and inquiry, while more recently the head trainer emphasizes accurate science content.”⁶ While this may result in inconsistencies between groups and training cycles, in general the trainers (who had spent a number of years as Explainers) are well-versed in the content of the exhibits and have expertise in practical strategies for visitor interactions.

Outcomes

This training is a key component of the Explainer experience at the Hall of Science, and is one of the many professional development opportunities that contribute to the growth and development of program participants. We know that skilled interpreters, docents, demonstrations and Explainers can enhance the visitor experience.⁷ But we know little about the ways that the Explainers themselves are affected by the experience.⁸ The Hall commissioned an evaluator to study the long-term impact. According to an evaluation by the Institute for Learning Innovation:⁹

- Participants developed self-confidence and communication and teaching skills, and generally seemed to have been positively influenced in their personal development during a critical phase in their lives.
- Participants were more willing than the average college graduate to consider a career in teaching.
- Participants acquired an appreciation for science and for teaching.
- Participants developed a life-long appreciation for and a personal connection to science and learning, and likely developed above-average science knowledge.

Also relevant are first hand accounts from Explainers who are currently employed at the Hall. When interviewed about various aspects of their jobs, two-thirds of Explainers had positive things to say about their experiences in training, with several listing this hour each week as their favorite part of the job. Those who responded negatively (22%) did not like having to spend personal time preparing to explain their exhibit each week, but understood the need for the process.

“It introduces new ideas to present materials, different ideas from different people. It’s an amazing way to teach exhibits. It never gets old because we have different trainers who all have different views of how to teach us. This, combined with all of the explainers, help us realize we are all trying to find different ways of communicating with visitors and helps us to think outside the box.”
-Explainer, age 21

“It’s nice how everyone has their own perspective, and you take 5 or 6 people into one exhibit, and they bring in things they learned on the internet or at school. And this is stuff you’ve probably never heard of in your life, and you plug that in and it’s awesome.” -Explainer, age 16

Recently, the Hall received funding from the National Science Foundation for a science teacher training initiative in New York City. CLUSTER, the Collaboration for Leadership in Urban Science Teaching, Evaluation and Research is a partnership with the City College of New York and the CUNY Graduate Center to build the capacity of secondary science teaching candidates. Participants benefit from a thorough integration of formal university coursework and museum work experience, and can immediately apply theory learned in their education courses to weekly training and day-to-day explaining. Now in its second year, the CLUSTER project is beginning to produce its first certified teachers, who describe their experiences in peer training as an important part of their progress toward facilitating inquiry-based science discussion in their own classrooms.

Research tells us that collaborative, inquiry-based teaching methods are effective in formal education environments as a way to empower youth, improve communication and critical thinking skills, and allow the co-construction of knowledge.^{10,11} Pairing this approach with engaging, hands-on museum exhibit experiences and passionate informal educators is most certainly a dynamic combination.

Peer training provides Explainers with the knowledge, skills and confidence to facilitate high quality interactions with visitors. These are skills that carry into their academic, personal and professional lives. Explainers report better grades in school, improved communication skills and better understanding of diverse learning styles. By devoting this high level of time and attention to this valuable resource, we can truly see the significant influence the science center can have on this most valuable, and often underserved, museum audience.

Notes and references

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