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6 Reflections on empowering youth in science museums

Marianne Achiam

Recent decades have seen a profound shift in the way museums perceive themselves and how they, in turn, are perceived by their surrounding communities and societies. New technologies, new economic realities, and rapid demographic and generational changes have set the stage for this shift[1] and many museums have responded quickly and decisively by re-appropriating their traditional and self-referential functions to reflect more community-oriented perspectives[2]. However, nineteenth and twentieth century museum logics may still linger in places, leaving members of the non-dominant yet fast-growing communities on the outside.[3]

Museums are not the only institutions undergoing scrutiny. The same winds that buffet what were traditionally the temples of knowledge also act upon that knowledge itself. More and more, assumptions about what constitutes scientific knowledge and the objectivity of that knowledge are being questioned. Haraway offers one of the most compelling critiques of the objective scientific "gaze from nowhere", observing that rather than being objective, this gaze "signifies the unmarked positions of Male and White."[4] Many other scholars have followed in her footsteps, pointing out the gendered, raced, and classed nature of Western science.[5]

Acknowledgement of this social injustice is manifest in the recent and widespread push towards the ideals of Responsible Research and Innovation (RRI) seen in societies and nations across the world, and in particular in the discourse of the European Commission, as outlined in the following essay by Rosenfeld and Blonder. It is at the intersection of these developments that we find the present-day science museums that participated in a European Union (EU)-funded project, called Irresistible, where they opened their doors to science students and offered up their spaces to the exhibits created in the project. The Irresistible Project developed at least two important themes: the implications for science museums exhibiting science produced by non-scientists, and reciprocally, implications for projects that rely on students producing and displaying exhibits in science museums. Small groups

of students selected scientific content and engaged in curating exhibits based on questions derived from the EU's Responsible Research and Innovation framework. The resulting exhibits featured socially and historically situated science, dilemmas related to science, and wicked problems with no clear scientific answers, all seen through the eyes of the participating students rather than those of the museum staff. What are the implications of this relinquishment of control for the participating science museums?

The socio-scientific and situated perspective that was prevalent in the student-curated exhibits is not necessarily novel to science museum exhibition designers[6]. However, the surrendering of curatorial authority is probably more unusual. Studies show how participatory practices in museums can be fraught with tension because they are perceived to challenge the expertise of staff members[7]. Further, some science museum professionals see themselves as full members of the scientific community[8]. The adherence to institutionalized notions of science afforded by this membership may further marginalize the roles and priorities of non-scientists in the museum.

Science museums can better serve their publics by adopting the participatory mind-set of Responsible Research and Innovation across the institution and establishing a permanent agenda of co-creating exhibits *with and for* their communities. This agenda would in many cases require deeper and more radical organisational changes to allow for a more equitable sharing of authority.[9] However, such a sharing of authority would not only create stronger ownership of the museum from its community: If it were made explicit, the sharing of curatorial authority would help dispel the "gaze from nowhere" illusion that characterizes much dissemination of science.

Students as curators

The Irresistible Project engaged students in deconstructing the science of scientists and reconstructing it in the form of exhibits intended to engage visitors in critical dialogue about science. In other words, the students who might more often have been on the receiving end of this process of *didactic transposition* (cf. Mortensen[10]) were put into the position of being producers. What are the implications of this role reversal for the students?

Few studies have examined the outcomes of engaging students in curatorial work. One line of inquiry focuses on how the meeting between students and collections-based objects affords scientific discovery processes and how these discovery processes are subsequently used by students as the raw material for the deconstruction and reconstruction of content for an exhibition[11]. Although the students in the Irresistible Project seemed to work with multimodal representations rather than specimens *per se*, a similar observation is hinted at by Kampschulte and Parchmann who write, "Developing

an exhibition with students includes a lot of tasks which require the use and application of several of these multimodal representations, while also reflecting on the communicative role of the exhibition.[12]

Taken together, this could mean that when students work directly with scientific objects, specimens, and representations rather than the heavily transposed versions they encounter in educational settings (cf. Clément, Mortensen[13]), new opportunities for scientific inquiry may arise. It is perhaps such opportunities that the Irresistible Project capitalizes on in the meetings between students and cutting-edge science, and that lead to the important learning outcomes.

Another important aspect of engaging students in curatorial work allows me to revisit Haraway's critique of the scientific "gaze from nowhere."[14] Rather than being objective, universal, and constant, scientific knowledge (and values and practices) is always relative to the institution it inhabits.[15] When transposed from one institution to the next – as was the case in the Irresistible Project when students deconstructed the science of scientists and reconstructed it as the science represented in an exhibit – the knowledge in question is transformed and adapted to fit its new institution. This means that when students are engaged in designing exhibits, they are also acquiring the ability to perceive and shift between institutional ecologies. I suggest that this ability effectively provides the involved students with a unique vantage point from which to observe the institutional relativity of scientific knowledge. Certainly, the study by Kreuzer and Dreesmann showed how, as a result of their curatorial activities, students acquired not only scientific content knowledge but also knowledge of the museum institution and its particular *ways* of producing scientific knowledge.[16] And when the students and teachers in the Irresistible Project began to "substitute an exclusively 'objectivist' and impartial view of nature and technology with a more complex and nuanced view," I suspect that part of this outcome can be attributed to a similar flexibility in institutional perspective prompted by the project.

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Notes

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