Museums as experimental test-beds: Lessons from a university museum

Jack Ashby

Grant Museum of Zoology, University College London, Gower Street, London, WC1E 6BT

j.ashby@ucl.ac.uk

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Abstract

Resistance to change is an accusation that has anecdotally been thrown at museum curators, but in my experience, today's museum professionals have extraordinary capacity to be innovators and experimenters. Here I will describe why and how museums might want to establish formal strategies to develop themselves as places where innovative ideas and practices can be tested as part of their everyday operations. I will set out why museums might want to establish a publicly visible experimental philosophy, focusing on lessons learned from the activities of the Grant Museum of Zoology, UCL.

The benefits of innovation include advocacy, raised profile, and an enhanced visitor experience. I will discuss various models to embed experimental practice. These can operate at different scales, ranging from small visitor studies and pilots to large-scale interventions potentially engaging every museum visitor, but all contributing to an atmosphere where experimentation is encouraged and ingrained. In this atmosphere, it is crucial that there is understanding and planning that allows for failure – some experiments do not work, and that is totally fine.

Keywords: Innovation, experimentation, visitor experience, digital, higher education, university museums, research, failure

Introduction

In 2011, the Grant Museum of Zoology at University College London (UCL) reopened in a new, highly accessible venue at the heart of the university, positioning itself as one of the key public gateways to UCL. The intention was to develop the new museum as a place where innovative ideas and practices could can be tested as part of the everyday running of the museum (MacDonald and Ashby, 2011). This would involve inviting academic researchers to use the museum in their research, but not only the traditional specimen-based research that is the mainstay of natural science collections. We would collaborate with them to use the physical space of the museum – as a public attraction – to experiment with modes of digital and physical engagement, communication, pedagogy and museology *on our visitors*.

As I will demonstrate, this approach proved successful. It has become embedded in our practice throughout the years since reopening. Indeed, the concept of 'Museum = Lab' is a central strand of the strategic plan of UCL Culture – the wider department to which the Grant Museum belongs (UCL Culture, 2016).

This is a reasonably common philosophy among university museums, but here I will argue how and why this way of working could be of benefit to any museum. This is not a new philosophy, and the Grant Museum is certainly not alone in working in this way.

Motivations and Outcomes

What could a museum hope to gain by establishing an experimental philosophy? Why would they want to be innovators? Arguably, deciding whether being innovative is a good thing is not a difficult decision for most museums. Despite the stereotype, resistance to change is not a characteristic I have experienced in the museum sector. Museum people are creative, ideas people.

Being innovative comes with all sorts of benefits. I suggest that they come in three broad categories – advocacy, profile, and visitor experience. The three are linked.

Advocacy

Most museums today need to work hard to convince their funders to continue supporting them (see, for example, Mendoza, 2017). This is true whatever the organisational model. For example, in university museums we are effectively being squeezed from both sides – the Higher Education sector has less money, and the museum sector has less money. The short story is that managers at university museums should never forget that, at any given moment, someone in their senior management could well be wondering whether the value added by its museums is of greater worth than the solid cash that could be brought in if they converted all the museum spaces into classrooms. There are similar pressures in other kinds of museums.

With these pressures on resources growing, museums must do all they can to prove their worth to their funding bodies. I would argue that one of the worst labels that a museum could be given is 'old fashioned'. The continuation of funding just because funding has always been there is no longer an assumption that museums can afford to make.

Developing a reputation for being innovative is almost always a good thing in the eyes of those who make decisions about a museum's funding. The museum sector changes all the time, but being involved in directing some of those changes is an attractive prospect. Developing new ideas and sharing them widely simply looks good to your funders. They want to know what their investment is delivering. If a museum can demonstrate they have developed a new idea that is having genuine impact on the outside world – by that idea being adopted by other institutions, for example – then the funders can see the value of their funds.

Beyond the simple appearance of positive outcomes, working on formal academic research programmes has the potential for formal recognition of the impact (with a capital I) of the work in the real world. Universities have to undertake the periodic Research Excellence Framework (REF) exercise, and being included as a research partner in a REF case study is a fantastic advocacy outcome for a museum. Particularly as, to date, there have been relatively few such museum-linked REF case studies.

Profile

This is closely related to advocacy, but thinking beyond a museum's own funders, being considered innovative by others in the sector also has significant benefits. The Grant Museum is a small museum, with fewer than five permanent staff and a decent but unremarkable natural history collection. Fortunately, we have been able to develop a reputation as people with good, impactful ideas, and to contribute to the wider sector in as many ways as we can.

We enjoy a significant level of national press coverage (approximately 75 national features a year (e.g. articles in publications like *The Guardian*, *WIRED*, *Mail Online*, *The Times*, etc.; or features on BBC Radio 4 or television news)). Our activities are also regularly cited as examples of good practice by our peers in the sector, and we are invited to contribute to workshops and publications by bodies like The Museums Association or Arts Council England (more than might be expected for a museum of our size). I believe that this is in a large part down to us gaining a reputation for always being up to something: that something is always going on and we are always trying new activities.

This isn't just because we do have a lot going on, but because we devote a relatively large amount of time to sharing the practice we have developed through press releases, blogs, conference papers, and other networks. The philosophy of striving to be an experimental museum is that the experiment is intended to test a new idea for the wider sector. Success is not simply measured by whether the experiment 'worked', but on whether it goes on to influence practice elsewhere – is the idea adopted by

other practitioners? Central to that model is communicating both that the 'experiment' is taking place (though we may not always use that word), and the results. Indeed, the project can still be successful if the experiment fails, if in failing the museum can share useful lessons they learned. This requires allocation of resources to dissemination.

Visitor experience

Finally, a major benefit of testing innovative ideas and practices is that – when it works – the museum ends up with something exciting to offer their audiences. Public audiences do not always know whether something they are encountering in a museum is at the cutting edge of new practice (though they might, particularly when it is using emerging technologies). However, if they engage with something memorable in their visit, then that builds motivation for them to stay longer and to come back.

Some of the more successful experiments at the Grant Museum have resulted in visitor offers that we regularly see mentioned in five-star *Trip Advisor* reviews. We love objects in the Grant Museum, and so do our visitors, but it is very clear that our visitors really enjoy engaging with new ideas and new technologies as well as object-led displays.

In the Grant Museum, embedding a philosophy as an 'Experimental Museum' has contributed to a ten-fold increase in visitor figures over the last five years. These kinds of statistics contribute to our profile within the sector, and our ability to advocate for ourselves to our funders.

Innovative, or experimental?

So far, I have used the words 'innovative' and 'experimental' relatively interchangeably, but they are not entirely the same thing. The benefits above can be gained from being seen as innovative, but I suggest that they are greater if the museum is experimental. An experiment has the inherent risk of either not knowing what the results will be, or that the results you get are not the ones you expected. The point is: experiments can fail.

As it typically relates to museums, innovation involves the implementation of a recently developed idea. In the main, the implication is that the idea in question is already understood to be a good one, and even that the idea worked – it produced positive results, for example an enhanced visitor engagement offer.

While it's much, much easier to succeed in bringing in benefits in terms of advocacy if the experiment works, there is still a lot to be said in terms of visitor experience and profile-raising within the sector, and with audiences, for getting a reputation for being an experimental test-bed rather than just being innovative. There are probably ways of being innovative without being experimental – for example by bringing in new models of practice and engagement *after* they have been tested and found to be successful, but *before* they have become mainstream, but that is not the focus of this paper.

Establishing an experimental philosophy

The decision for the Grant Museum to work at being an experimental museum was a deliberate one – we actively set about seeking research partnerships and made projects very visible from the outset, so that other potential academic collaborators saw that we were open to proposals. We even designed the new museum space with this kind of work in mind.

The first thing we did, and continue to do, is *say* that we are an experimental test-bed. Every time we get in front of a museum or a Higher Education audience, or whenever we write a practice-based journal article or press release, we *say* that we want to act as an experimental test-bed. Such repetition of the message is key to getting the idea ingrained in stakeholders' opinion of you. This needs to happen from the top: strategic plans and senior management's communications need to reflect the philosophy if a museum's staff – and ideally its audiences – are to believe that they are an experimental test-bed.

What do museums have to offer?

The key way in which we adopt innovative experimental activity is to work with academic researchers, who are specifically employed to create new knowledge, and test new ideas. Much of this work has involved research into new models of digital engagement, testing whether certain ideas or hardware would 'work' with a public audience in a museum setting.

Museums and their staff have a number of things to offer academic researchers in an experimental project. Indeed, this kind of research would be potentially impossible without museum partners.

Chiefly, it comes down to space, audiences, and expertise.

If a research project is attempting to test whether a new idea, technological innovation, or model for engagement will actually deliver the outcomes it has been designed for, they will need test subjects. Doing this in the artificial environment of a lab or office is unlikely to provide reliable results; true success can only be evaluated 'in the wild'. It also requires unbiased participants, often coming in with no prior knowledge. If a new development is intended to work with a certain public audience, then it needs to be tested on that audience. Museums can provide academics with their 'guinea pigs'.

There are a number of ethical considerations in working with potentially unwitting members of the public that I will return to later, but many researchers struggle with finding enough people to include in their studies. Museums can pretty much guarantee that they can get an experiment in front of a real person. Likewise, if someone is testing how a certain digital platform will work in a museum environment, then they need a real museum in which to test it. Museums can literally open their doors to providing the real-world environments the experiments require.

Finally, museums have extraordinary expertise in their staff. Museum professionals are experts in public engagement, interpretation, communication, and exhibition design. While the project is in development, it is the museum's role to play the audience-advocate. Often, the academics on a research project will be seeking to test how people behave around a new digital development. They may be experts in building the digital platform and developing the software, but they may benefit from the museum staff's perspective on how visitors will encounter it in a museum setting, what their motivations are, and anticipate potential hurdles. This expertise is invaluable to the researchers.

Experimental case studies

Here, I present examples of previous projects the Grant Museum of Zoology, which operated at different scales but all contributed to an atmosphere in which experimentation is encouraged and ingrained. In such an atmosphere, it is crucial that there is understanding and planning that allows for failure – if the experiment does not work, all is not lost. You haven't bet your house on it, and you've never called it anything but an experiment.

These case studies are provided as possible models for how experimental working could manifest in museums, operating at different scales. The model for experimentation or study is intended to be the example, not the content of the projects themselves.

1. The simplest: A short-term visitor study

The Grant Museum allowed a post-graduate student to undertake a potentially risky visitor study: to enquire how best to display challenging objects and to communicate uncomfortable histories (in either museums or non-museum settings). The object they used was a respirator that was used to keep dogs alive during vivisection in the 1930s. The topic of live animal experimentation is a very difficult one, with the potential to upset visitors, and as such comes at some risk to any museum displaying it (particularly when it relates to the institution's own history with that subject).

By putting an object like this on display, the museum risks its reputation, as it could be interpreted as supporting animal cruelty (whatever its official stand on animal experimentation). How can museums discuss this history without alienating visitors, or risking their own reputations?

The study sought to engage small numbers of visitors by testing two different modes of interpretation, which used different approaches to communicating the history of the object. Visitors were engaged in a structured interview about their reactions to the object and the different interpretations. The presence of such a contentious object in the museum in these circumstances avoided the reputational risk, as the uncomfortable issue of vivisection was cushioned by making it very clear that the study was seeking people's views – visitors knew that the topic was under study. In fact, such conversations have significant potential to enhance the visitor experience as their views are being sought to influence broader practice, and if they do have strong views on the topic, then they could feel that their feelings are being taken into consideration (Fewery, 2014).

For the museum, the costs of allowing the researcher to involve visitors in the study are minimal. All that is needed is some space, some simple signage (that could even be provided by the researcher), and – as with all the examples provided – for the museum to ensure the appropriate research ethics measures are in place (see below).

2. Pilot study or focus group

This involves the museum recruiting a sample of the desired audience from among its visitors to attend a facilitated workshop with a specific research goal in mind. It will often require the group to attend a series of meetings over time, in order to measure change in the attendees' behaviour or understanding. At the end of the project, it is possible that the research could have developed a product that the museum could use as a broader visitor offer.

At the Grant Museum, we worked with an academic (Angeliki Symeonidi) from the UCL Institute of Education, who was studying the pedagogical impact on a child's learning when they were involved in the development of an educational video game, set in a museum. The Museum advertised the opportunity to be involved in developing a Grant Museum-based computer game to its family audiences (through mailing lists). The researcher managed the communications from interested parties, as well as the incentives for attending.

For a series of workshops during which the video game was developed, the museum offered the gallery space to be used out of opening hours, and provided feedback on the zoological and museological content of the game. The researcher interviewed the participants each week, and made observations from recordings of the sessions in order to measure any impact on their learning.

The fact that the museum advertised the opportunity through its mailing lists also meant that the project was visible to a far wider audience than just those few who actually wanted to take part. This contributes to building a museum's reputation for such activity.

There also remains the possibility that the game that was produced by the group could be 'adopted' by the museum (with some investment) to be offered to visitors more generally. This possibility arises regularly with experimental museum projects – in order to test whether a new technology works as part of their research, for example, they may have to build a fully operational product. If the museum likes what it sees, then it can roll it out as part of its standard visitor offer.

In order to do this, it is important to agree in advance who owns the intellectual property of any new innovations, and whether the museum has the right to use them beyond the conclusion of the research (and under what terms). Partners should also agree what happens if other institutions want to adopt the idea – do they have to start from scratch, or does the team want to share the inner workings? What support would the partners be willing to provide other museums interested in the idea, and how would such impact be measured and recorded? These kinds of data can prove very useful if the project does end up being included as a REF case study, or even just to show funders what impact the museum is having through its experimental work.

3. A live test in the gallery

For experiments that rely on testing how museum visitors behave around new digital innovations or models of engagement, or whether a certain innovation is enhanced by being incorporated into a museum environment, researchers could seek to temporarily insert their idea into a gallery. This allows them to see how their innovation works 'in the wild', on the specific audience that it is intended for.

These tests can operate at vastly different scales, ranging from a few days to several years. Small, short tests in a live gallery situation can inform the feasibility of a larger study. In the past year, we have worked on smaller projects with both Augmented Reality (AR) and Virtual Reality (VR).

The former was a post-graduate student project with UCL Computer Sciences. The student's task was to build and test a functional AR app to meet an identified need (so this project could be considered as a pedagogical exercise as much as a research programme). They sought guidance on a real-world need in a natural history museum which could potentially be solved by AR. We suggested that they augment some of the skulls and skeletons that we believed visitors had difficulty interpreting on their own – for example, where do the eyes, trunk, and ears connect on an elephant skull?

The student developed an app that would layer these features onto the object when the camera on a smart device was held up to the specimen. This involved a number of meetings with the student, and access to the specimens on display, as well as guidance on the zoological content of the digital models they created. The plan was then to test this in the gallery with our visitors. This final testing phase did not happen, and this is discussed further in the pitfalls section.

With the VR project, a Professor of Protein Biochemistry (Matilda Katan) approached us to test whether museums were a suitable place for visitors to

use VR technology. The rise of Virtual Reality has been well documented, and its use in museums and other cultural settings is on the rise. However, the sector may need to consider that museums are places that parents and carers might be visiting in order for their children to escape from 'screen time'.

Matilda Katan had been working with a VR software development company to produce a VR tour of an animal cell for use in educational settings, such as schools. Her team was interested in whether visitors to museums – which are full of stimulating *physical* realities – were interested in opportunities to explore virtual content on a topic linked to the museum's collection, or if these experiences are best kept in the home or school, for example.

Figure 1. A visitor taking part in a virtual reality experiment in the Grant Museum. Image © UCL / Matilda Katan.

Museum staff with a background in learning provided feedback on the length and pitching of the content on the VR tour to the museum audience they were targeting, which led to some changes before it was tested in the gallery. The researchers offered the VR experience to visitors during several of our pre-existing family activity days (alongside our own standard activities), and interviewed users about their experience. This is being used to inform the applicability of such products for museum settings (see Katan, 2017).

While the activity days as a whole were advertised widely, we didn't promote the VR experience specifically, in order to manage expectations. This is because we were aware that the number of VR headsets and the length of the tour meant that demand could easily outstrip supply. Also, if people specifically came to the museum in order to experience the VR app, it could bias the study into whether museum visitors in general thought VR was appropriate for museums.

Aside from these shorter projects, which lasted a few months and targeted specific groups of visitors on specific days, we have also run long-term major interventions aimed at accessing ALL of our visitors.

QRator was a project which ran from 2011-2016 and tested models for user-generated content in museums, following the trend for democratising the museum experience for visitors. Ten iPads were mounted on specially developed object-based displays, which asked visitors to share their thoughts on questions around science in society or how museums should operate, through a digital conversation (see Bailey-Ross et al., 2016). At the time, it was only the second time that iPads had been installed in permanent museum displays (and arguably the first that actually relied on the specific features of iPads), and was considered 4-5 years ahead of the 'adoption curve' for the sector (i.e. that the concept was likely to be widely adopted by the sector in 4-5 years) (Johnson et al., 2011).

As well as being a significant visitor offer in the gallery, it was also the centre of two PhDs: one of which studied the behaviour of visitors around 'social interactives' (museum interactives which essentially borrowed conversational models from social media); and one on the technological aspect of how such products are built.

Although the in-gallery phase of the QRator project was only initially anticipated as lasting a year, the overwhelming success it achieved encouraged us to keep it running for five years. Visitors regularly cited it as one of the highlights of their visit, and it garnered significant interest from the museum sector, with fellow professionals coming to see it from around the world on an almost weekly basis. Parallel systems were eventually rolled out to a national and an independent museum as part of the study. In the end,

the success of the project brought to light pitfalls that we had not anticipated (see below).

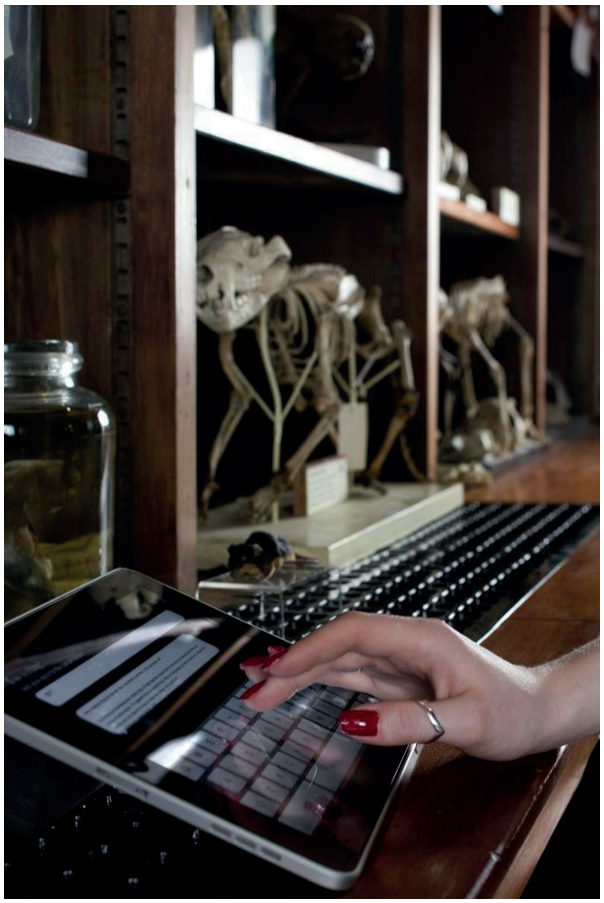

Figure 2. QRator was a major research programme into user-generated content in museums, and how visitors behaved around 'social interactives'. Image © UCL.

Pitfalls

Failure of the product or idea

As has been mentioned, whatever efforts or expertise have been invested in a new idea, failure is a possible outcome of experimental working. The museum must be willing to deal with the consequences of an innovative idea not delivering on its aims. Collaborating on research is an inherently risky undertaking, particularly when technology is involved. Oftentimes, there will be multiple stakeholders driving the project: the museum itself, audience focus groups, the researchers, and the technology developers.

As with any partnership project, objectives may not be completely aligned between the different stakeholders, and lines of responsibility can be complicated. We have worked on projects where the developers reported to the researchers (as they were the ones paying), which left us with limited power to insist on changes to products. This can lead to the museum having to decide whether to allow an idea to be tested on their audiences, when the museum staff are certain it will fail. This is a very difficult situation to plan for, but clear Memoranda of Understanding are vital, and I would advise retaining the option of refusing to allow the idea into the gallery if you feel it will diminish the visitors' experience. Be specific about what resources the museum is willing to contribute, and think carefully about what you are signing up for.

Visitor expectation also needs to be managed: museums should go to lengths to communicate that visitors are being involved in an experiment, and wish to learn from their experiences – both good and bad. We have tested truly awful digital products in the gallery, and could do so without diminishing the visitors' opinion of us by being extremely clear that the purpose of having the product in the gallery was to see if it worked. Them telling us that it didn't work ended up being a positive experience for the visitors, as they could see that their input was contributing to academic research.

Failure of completion

Another risk of partnerships where partner objectives do not completely overlap is that once the academic aims have been completed, the realities of taking the project to the point at which it can actually affect the visitor experience can, in our experience, be deprioritised. This is perhaps particularly true with student projects which focus on the *development* of a technological innovation, rather than the users' experiences.

Research teams may enter a project with every intention of both building and testing a new idea, but the realities of unfolding timescales may mean that they do not reach the final stage. This is bad news for the museum, as it is through the actual live-testing and implementation that the three benefits of profile, advocacy, and visitor experience are likely to bear fruit.

We have engaged in a number of student products where the design and development phases have overrun, and, while their projects suffer from their failure to get a user perspective for their assessments, the reality is that once their submission deadline has passed, they are unlikely to be willing to continue to deliver on putting it in a live gallery environment. We

are yet to find a solution to this, beyond stressing the reasons why the museum is investing in a project and hoping for the best. Museums without a strategic reason to support student research may be best to avoid technology-based student projects with short timescales (e.g. Masters' programmes).

The problem of success

Success can come at a cost – what does a museum do if the experiment far exceeds its expectations? Does it have the resources to continue deploying the technology after the research has finished?

As was mentioned, the QRator project was far more successful than we had anticipated, and we found that its presence in the gallery was a significant contributor to our visitors' experience. This means we had real motivation to keep it running.

With technological experiments, it is important that the partners are clear who is responsible for its maintenance. Depending on the museum's digital expertise, it is likely that the researchers are either directly responsible for the back-end development and maintenance, or have commissioned support for this from an outside company.

All research programmes are time-limited – when the research programme has achieved its academic objectives, or reached the end of its funding, the museum must decide if it can continue to support its deployment. At this point it would stop being an experiment, and simply become a visitor offer.

With QRator, the researchers decided to extend the original remit of their enquiries, as the project was continuing to produce invaluable data, but it did eventually come to an end. We decided to keep it in the gallery only as long as it continued to function. Once it was removed, visitor comments showed that they were disappointed that it was no longer available, and so the museum worked to communicate that the experiment had come to an end, and to share the project's findings.

Ethics

This isn't really a pitfall, but it does need careful attention. Using information gathered from public visitors in academic research requires adherence to ethical guidelines, beyond standard data protection legislation. If partners in a project team belong to a research institution (such as a university), then their research will need to be approved by that institution's ethics boards, as well as the museum's (if it has one). Ethical guidelines for academic research typically make a distinction between 'evaluation' and 'research', and it is important to know whether an experiment is one or the other (evaluation is typically beyond the scope of ethics boards).

Museums undertaking research involving their visitors should have procedures to ensure any experimental projects fall within the ethical standards of their research partner organisations. At the simplest level, this could just be to ask to see the confirmation from that institution's research ethics board that the researchers have had their research proposal approved.

Discussion and Conclusions

The Grant Museum of Zoology at UCL is a small museum with an unremarkable collection, but it has found significant success (for example, winning multiple awards and dramatic increases in visitor numbers) in part due to its efforts to position itself as a venue for experimental working. We are both active in our recruitment of potential academic research partners, and welcoming to those who approach us directly. We have found that the financial costs are low (because we ensure they are covered by the research partners), and we manage staff resourcing by agreeing early on what the museum staff's involvement would be in a project.

Experiments can fail, and museums engaged in experimental practice must be prepared to accept and expect failure. With that said, museums should not be afraid to say no to proposals if they think the experiment *will* fail. The museum professional's role in most museum-based academic research of this kind is to provide expertise in what to expect from visitors in a given setting. As such, they should trust their instincts and reject some proposals before they are tested. There are pitfalls to be aware of and anticipate, but some of those are hard to mitigate for. Clear partnership agreements are vital.

Experimental working is not the exclusive remit of university museums. Museums of all kinds can benefit from these practices, and there are universities and researchers out there looking for places in which to experiment.

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