Imaginations of future science communication in science centers. Speculations on methods for changing exhibition practices.

Dagny Stuedahl,
Norwegian University of Life Sciences

Introduction

My approach to design takes departure in my background as ethnologist, trained in methodologies such as cultural analysis and cultural studies. These research traditions do focus on how various forms of disruptions, contrasts and conflicts constitute culture. My interest in design lays in how these cultural processes informs the knowledge that is taken into action in design. Understanding design as a performative endeavor that is dependent both on the designer and the user, has paved the way for my interest in design of technologies as deeply dependent on encounters between judgements, negotiations, practices and resistance that has historical, cultural, material and social character (Stuedahl 2002, 2004). This understanding tunes well into current discussions as part of ontological turn in anthropology focusing on performativity and enactments as ways to grasp how people in fact handle multiple, and sometimes contradictory knowledges in practical ways.

This has shaped my interest in the relation between design methods and research methods in processes of change –grappling with the question of how a design intervention differs from an intervention based on ethnographic methods. Also, when working within design projects there is a thin line between interaction and intervention, making it difficult to grasp when interventions do start and when they stop. These questions relate to the doing of ethnography, that represents intervention in one way or the other whether by asking online communities questions or by trying to engage communities of immigrant youth in Oslo city. The forms of interventions take shape by the contexts and breeding grounds, and while the one intervention may

gain a lot of empirical material – would the second gain nothing at all because the intervention is not grounded as meaningful. For interventionist design anthropology to be a process of cultural production and transformation (Smith 2013) it is therefore salient that all participants involved get something out of it.

This is a central point for the concern I would like to rise, related to the theme of this seminar on Interventionist Speculation. As ethnographers in the design field we observe and participate in the performance of various design methods; sketches, mock-ups, scenarios and narratives, visualization techniques etc. that more or less are generic methods that travel from one project to the other, independent of content and aims of the projects they act within. But as ethnologist I also ask how these methods resonates with the people involved in design projects. I have earlier observed how use of design methods may disregard local cultures and practices, and how these methods could have been adapted to make the design process more appropriate for all participants in co-design processes (Stuedahl 2004). Methods and design facilitation do interact influenced by a wider context of participation, ownership and power (Light 2010). This makes it relevant to think about what kind of speculations design interventions in fact represent, who`s speculations these are and for whom the speculation in fact is inventive. Appreciating speculations as filling the space between here and now and the future, or as a method that enable us to think about the future and critique current practices (Auger 2013), makes me think about the different understandings of speculations that in fact may be involved. Speculations can be guessing about how something is going to come out, but they can also be contemplative reflections or thoughtful considerations – and they can be based on hypothesis and a tentative insight into possibilities. Somehow speculations include both aesthetic musings and practical conjectures – and it is a question if one speculative action brings forth the same speculative reactions in a composed group of people. Or, if we have to deal with multiple speculations, each with their own grounding and goal.

I am asking this based on reflections on how it went when I introduced Future Workshop methods as a technique for science educators to use in their efforts to change badly designed installations in their museum or science center. I am asking myself what in fact came out of the session, for them as well as for me as facilitator –

and as researcher. And I cannot agree with myself on whether this introduction was more of a Speculative Intervention rather than Interventionist Speculation. There is a chance that the introduction of method was more about my curiosity on how the method would be understood by science educators – rather than introducing methods that I knew would help them in doing interventions in their institution. I will share my preliminary reflections on the session in this text, which later will be discussed with the participants that performs in the case, and in this way build the next step of understanding the thin line between speculation and intervention.

Design as becoming in science education

Currently, I am involved in a science communication project called EXPAND in Norway 2011-2016 (Stuedahl et al 2014) that collaborates closely with science educators from museums and science centers to create a research based grounding for understanding how these institutions may engage people with science issues. The science educators we collaborate with come from all the 9 science centers in Norway, and are passionately engaged in developing new forms of communicating science. They engage in discussions on how to break old barriers between social and natural science, or how positivist knowledge traditions may be changed by new reflective approaches and may be informed by the fields of Science, Technology, Society and Environment and Socioscientific Issues (Pedretti 1996, Pedretti & Nazir 2011, Solomon & Aikenhead 1994, Zeidler, Sadler, Applebaum, & Callahan, 2009).

Currently several initiatives keep science centre educators updated through associations and networks, sharing guidelines and thematic discussions etc. These initiatives gives examples of how the science education field involves in organized, in-depth, long-term initiatives to change educational practices in schools and science centres. Meanwhile does these initiative little to prepare science educators on how to apply educational theories and approaches in re-designing and changing the physical installations or exhibits in their museum or science centre. The overall aim of applying a design approach in this project was therefore to involve curators and educators in active and practical re-design of badly functioning installations and to expand established methods and procedures for exhibition development. Many installations in these institutions do communicate science very badly. A co-design

approach was chosen to emphasize approaches to exhibition design that goes beyond established methods of visitor studies and formative evaluation that dominantly informs exhibition design in the field. To achieve this, the project focused on sharing tools and methods and ideas of how to critique existing installation designs. The design focus in the project was therefore on both the product, the process as well as facilitating science educators in using open ended experiments to explore possible configurations and potential use.

This is processes of learning in doing, where concepts and ideas for re-design are born and developed in collaboration. Design is therefore defined as mutual experience of becoming, that brings attention to how encounters in design processes may form knowledgeable participants in possession of agency to enter emerging landscapes (Binder et al 2011, Binder 2014). This focus on becoming is relevant for my concern I would like to raise here on how design methods, tools and techniques relate to the social and cultural practices (Sanders & Stappers 2008) that design intervenes with – or not. Considering design as becoming is therefore central for the discussion on interventionist speculation that I would like to raise since the design project is as much about supporting science educators to do design and re-design of exhibitions as it is about understanding installation artifacts as products of design.

Introducing design approaches to science educators

The science education field with which science center and museum are affiliated, have a longer tradition of collaboration between practice and research. We find that action research methods are used to combine practice and research in museum professional development of new learning activities (Ash & Rahm 2012). Also, methodological traditions of design-based research (Brown 1992, Collins 1992, Sandoval & Bell 2004) are used to conduct formative and test-based research in real educational settings. More recently, new approaches introduce 'design experiments' with less focus on formative interventions and testing, and in which the process of designing possible future solutions and visions is framed as a component of investigation (Boling 2010). This emerging re-structuring or re-thinking of design based research and experimental methods are related to the range of challenges that

meet educational research today, and the need for methodologies and strategies that address these. Science centres need to focus on the social and cultural aspects that supports new directions of educational thinking that that meet with the belief systems that visitors bring with them and that constitute their learning in science centres (Ash & Rahm 2012). This meanwhile needs to be approached with methodologies that support social and cultural explorations of how engagement in science may possibly look like in the future.

This is a focus of the national research program EXPAND, aiming at exploring possible future educational activities in science centers. The situation of speculative interventions that I reflect upon is obtained from a Continuing Professional Development (CPD) course that involves science educators in explorations of how installations may be re-configured to support engagements in science. The CPD course is based on science center educators learning by implementing methods and theories presented in the course in re-designing an installation at their center as part of course tasks. They conducted qualitative observations and video recording of visitors interacting with an installation, transcribing these video-recording and identifying problems of interactions on transcriptions and presented possible solutions to the problem by suggesting changes, configurations or re-design of the installations. Also, the participants wrote logs from their ongoing work, and participated in Skype meetings with course teachers. The course lasted for a period of 9 months, and included 4 workshops and connects to ongoing movements among science center educators to develop a shared language and shared practice (Tran 2007), specifically related to focus on learning with exhibition objects and installations. The CPD modules gives 15 ECTS credits and participants in the CPD modules are automatically participants in the research activities of EXPAND.

Getting design methods to work

The situation of speculative interventions - or interventionist speculations that I reflect on, is taken from the second session in the CPD course. Future workshop (FW) was here introduced as a method for change that takes departure in collective actions of first defining a problem and then a solution. The origins of the method, as well as the

five phases of preparation, critique, fantasy, implementation and follow-up phase of the FW method was introduced. And the session was defined to perform the critique phase, the fantasy phase and the implementation phase in a condensed format within 2 hours. The course space was divided into three zones, one for each phase and the science educators moved in groups of five persons from each zone, where a facilitator lead the collaborative explorations of the problems, visions and possible solutions with their installation. The short time span, and the movement between the three zones, resulted in that some installations got more attention in the groups than other. The session ended with a plenary presentation where each educator presented the process and the resulting ideas for re-designs of their installation. After the FW session, the science educators wrote micro-texts about their experience. These texts were collected and constitute empirical material for research together with video recordings of the discussions in the zones.

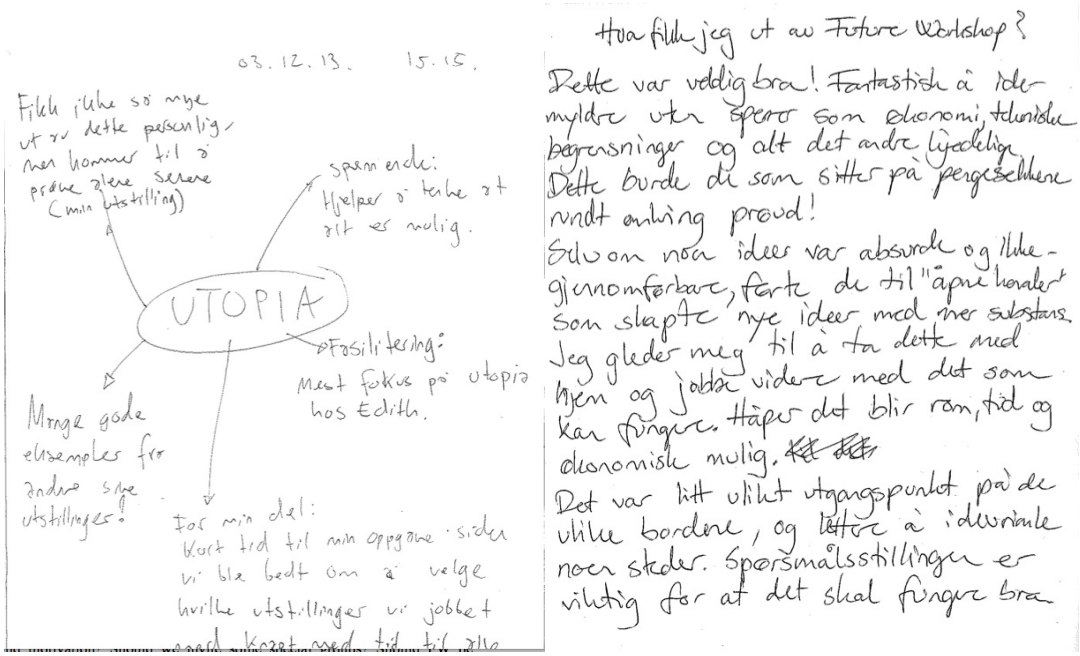

Fig.1 Science educators micro-writing reflecting on the relevance of Future Workshop for their re-design of exhibition installations

And it is also these texts that make me reflect upon the thin line between speculation and intervention; The educators found the FW method exciting and found that the method helped to start thinking from the point ‘that everything is possible’, that this

‘opened channels’ and helped going from absurd ideas to ideas with ‘more substance’, and that it was exiting to use brainstorming methods without taking notice of economic or technical restrictions. Meanwhile, the point where I think the introduction of FW-method rested in merely speculations, and not interventions, relates to that few reflected upon how they could use the FW method in their on-going re-design work.

If speculative design would be the bridge by which designs engages participants, it seemed that the participants considered the FW method as interesting but not relevant for their work in the course. They understood the method as a way to bring more people in to creative processes in exhibition design, and did also discuss how this method may be suitable for involving departments and people in their science centre that they normally do not work with. This is totally correct, and I was happy to observe this. But why did they not see the method as relevant for their on-going work in the course? Why was this method not understood as an aid for finding possible solutions for their installation with their colleagues? It seemed as if the method represented a different approach, that was interesting but not in confluence with the more traditional and systematic research methods they had used to work out proposals for re-design.

This questions what is the desired result of design speculations arises, as they may take different shape and have a different meaning to people. The FW was understood as a creative process, that would support involving people and that gave capacity to think out of the boxes of the everyday routines in the museum. But, the method seemed not to be understood as to give information relevant for developing a firm re-design of the installations. Without tripping in discussions of dichotomy of two cultures, the situation points to how the design methods we use may be understood in multiple ways and how this may conflict with the desired speculations that designs proposes.

The anthropological encounter of design has been expressed as a mutual experience of becoming (Binder et al 2011), that needs to be staged so that the performative moments – or actuals of asking the ‘what if’ question touches upon the real (Binder 2014). How do we relate to this, when the ‘what if’ question is posed to another problem than the one focused upon in the project? Does design then not

further than to become loose speculations – or should we blind trust that the intervention has occurred?

Bibliography (font: Century Gothic Regular, size: 12)

Ash, D., Rahm, J., and Melber, L. (Eds.) (2012). Putting theory into Practice. Tools for Research in Informal Settings. New Directions in Mathematics and Science Education vol 25. SensePublishers Rotterdam/Boston/Taipei

Auger, J. (2013). Speculative design: crafting the speculation, Digital Creativity,

Binder, T., De Michelis, G., Ehn, P., Jacucci, G., Linde P. & Wagner, I. (2011). Design things. Cambridge, MIT Press .

Binder, T. (2014). Design Laboratories as Everyday Theater. Encountering the possible. Paper for the seminar "Ethnographies of the Possible", April 10th, 2014, Aarhus, DK, The Research Network for Design Anthropology.

Boling, E. (2010). The Need for Design Cases: Disseminating Design Knowledge. *International Journal of Designs for Learning* 1:1. pp.1-9. Retrieved from http://scholarworks.iu.edu/journals/index.php/ijdl/article/view/919/978

Brown, A. 1992. Design Experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. Journal of learning sciences 2:2, pp.141-178, Lawrence Erlbaum Ass.

Collins, A. 1992. Toward a design science of education. In E. Scanlon & T. O'Shea (Eds.), New directions in educational technology (pp. 15-22). New York: Springer-Verlag

Light, A. Democratising Technology: A Method, in Designing for the 21st Century: Interdisciplinary Methods and Findings (ed T. Inns), Gower, Ashgate Publishing, 132-145.

Sanders, Elizabeth B. -N., Stappers, P. J. (2008). Co-creation and the new landscapes of design. CoDesign, 4: 1, 5 -18

Smith, R. 2013. Designing heritage for a digital culture. Gunn, W., Otto, T., Smith, R. Design anthropology. A different style of knowing. London, Bloomsbury,117-139

Stuedahl, D. 2002. The performativity of design. Participatory design of new practices. In Binder, T.; Gregory, J.; Wagner, I. (ed.): Proceeding of the Participatory Design Conference 2002 (ISBN 0-9667818-2-1). Malmø. June 23.- 25. pp 254-260

Dagny Stuedahl 2004. Negotiations and persuasions. Knowlegebuilding crossing boundaries of knowledge traditions in participatory design of new ICT [Forhandlinger og overtalelser. Kunnskapsbygging på tvers av kunnskapstradisjoner i brukermedvirkende design av ny IKT.] Dr. Polit- thesis. UniPub, Faculty of Education. University of Oslo

Stuedahl, D., Frøyland, M., Eikeland, I. (2014).EXPAND – Research in Norwegian science centers. Nordisk Museologi, 85-95

Pedretti, E. 1996. Facilitating Action Research in Science, Technology and Society (STS) Education: an experience in reflective practice. *Educational Action Research*, *4*(3), 307–327. doi:10.1080/0965079960040303

Pedretti, E. ,Nazir, J. 2011. Currents in STSE Education: Mapping a Complex Field, 40 Years On. *Science Education* 95:4, 601-626. Whiley

Sandoval, W. A., & Bell, P. 2004. Design-based research methods for studying learning in context: Introduction. Educational Psychologist, 39:4, 199-201.

Solomon, J. & Aikenhead, G. (eds.) (1994) *STS Education: International Perspectives in Reform*. New York: Teacher's College Press.

Zeidler, D. L., Sadler, T. D., Applebaum, S., & Callahan, B. E. (2009). Advancing Reflective Judgment through Socioscientific Issues. *Journal of Research in Science Teaching, 46*:1, 74-101.

Tran, L. (2007). The Professionalization of Museum Educators: The Case in Science Museums. Museum Man & Curatorship 22:2,131-149

Surname of author, capital letter of author. (year of publishing). Title of Chapter. Title of Book or Article. Affiliation, Publisher, page-page. (Font: Times New Roman Regular, size: 12)

Surname of author, capital letter of author. (year of publishing). Title of Chapter. Title of Book or Article. Affiliation, Publisher, page-page. (Font: Times New Roman Regular, size: 12)
References: