
Flying Things on Strings

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Abstract

The workshop seeks to explore the possibility of advancing Maker Culture through creating a maker learning experience for novices. Maker Culture is driven by and driving a process of emancipation from a consumerist attitude and of users' self-empowerment

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that the digital medium affords. This process is about play and a playful perspective, a way of seeing, explaining and changing the world. Becoming a maker is the decision to dare to create, and the process is not primarily about skills – it is an attitude towards technology, media and the world. It requires an experiential learning mindset, this is not a new concept: 'For the things we have to learn before we can do them, we learn by doing them' (Aristotle). In relation to maker culture and digital mastery experiential learning and play allows media consumers to become producers, artists and players.

Author Keywords

Maker culture, making, play, learning, experiential learning.

ACM Classification Keywords

B.m. Miscellaneous: Design Methods.

Who are makers and what do they do?

Making is about the freedom to create that comes from having a wide range of options available; asking the right questions; needing and wanting to make informed decisions, because we (as creators) know best what is happening (cf. [2]). It lets people make fundamental decisions, and forces them to make them; not just 'choose one of three products available in an interactive shopping experience or [...] decide when and how to kill the simulated enemy in a game.' [6] In becoming

makers people take part in the deliberate and conscious construction and deconstruction of both the digital and analogue world around us.

The process of self-empowerment is a collective process of a community of people who share common interests. The consumer turns into a producer when he demands and takes control over the digital medium, when he starts to (mis-) use it for his own goals, producing, contributing, extending, changing and creating reality.

For this to happen an interested party invested in the result of a project is required to sustain motivation. It appears easy and most rewarding when people learn what they are interested in, what is relevant for them and what benefits them. 'Learning occurs best when there is a desire to attain specific knowledge.' [4] It is hardly possible to keep somebody from learning when he wants to learn something. For Papert, '[t]he cycle of self-directed learning is an iterative process by which learners invent for themselves the tools and mediations that best support the exploration of what they most care about.' [1]

The investment is applied to a meaningful maker process through diverse iterative action. Experiential learning relies on the student's ability to create and reflect through available tools and critical insight. Kolb defines learning as 'the process whereby knowledge is created through the transformation of experience' [3]. Making is not producing. It is not a finished product that is manufactured, but an ongoing process of building, using and modifying that is maintained.

Why should maker culture be advanced?

We argue that maker culture develops a mindset that allows users to navigate in a digital world by knowing what to look for in tools and libraries, to understand and appreciate tools, as well as being able to create them. It is about developing the common sense ability to identify not only the right question, but the right tools to address that questions and the ability to evaluate when a meaningful answer has been reached. The play and learning mindset of making turns a failed experiment into just another iteration and insight gained on the road to success.

Makers transcend the limitations of the user, who relies and depends on commercial tools. 'One of my personal goals for this project is to facilitate designers' taking control of their own tools. [...] As designers have become fed up with available tools, coding and scripting have begun to fill the widening gap between what's in the designer's mind and the capability of the software they've purchased.' (Ben Fry in [5]) People can be critical of media and the possibilities they afford, and question them: What is made easy to do, and what is made impossible?

How to become a maker?

When enthusiasts built their own computers in the 1970s, they were a few freaks and experts, and there were not many applications these computers could be used for. Today a critical mass of people is involved with digital media, have skills, or skills are acquired easily enough (e.g. Lego, Arduino, Processing, Java). There are real-world applications in everyday settings and situations for ordinary people.

But becoming a maker can be hard because people are not used to the process of dealing with problems, break downs, perceived failure, uncertainty and doubts. This demands effort and commitment, and not being blinded or seduced by pre-fabricated material, just a button click or a link away.

People need to realize that missing skills and resources are part of the game, and its motor. It is naïve to wait for (future) skills, e.g. programming skills. In Kolb's Experiential Learning Model active experimentation is mediated through concrete experience and learning is facilitated by reflecting on the experience and subsequently creating meaning through abstract conceptualization.

Project: Flight

We propose to build contraptions that fly by technical means and are tethered by strings. We anticipate three possible realisations: Putting a kite or hot-air balloon on top of something and lifting it up ('chopper model'), putting a stationary fan under something and pushing it up ('surf model') and putting a propeller on a plane on a string which then circles around a center point ('dog model', Figure 1). We are open and hope for other interpretations and realisations. The project includes a competitive angle, but the criteria of success are emerging, and are not prescribed.

The practical workshop frames experiential learning as a challenge, a struggle and a competition. A play where learners empower themselves and each other.

The project utilizes digital and analog fabrication, and maintains low entry barriers. Participants are asked to make flying apparati from everyday and fablab

materials that are actuated through sensor equipped arduino boards. Through this workshop we hope to gain insights into what motivates makers. We provide the basic elements and the opportunity for people to create flight. However, it is not dominated by a technical or engineering focus, but open, explorative, inviting experimentation. The project engages multiple senses, and can be done just for the sake of it.

But the main point we like to demonstrate with the project is, how making supports learning: Participants are self-motivated, taking control, empower themselves, collaborate and play against nature. Flight is one of the great dreams of man (together with fire and x-ray vision), and they decide to accept the challenge.

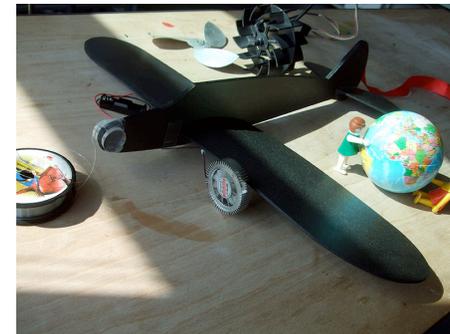


Figure 1. Pre-workshop experimentation.

The idea of every user being also a producer can only aim for a continuing iterative process of use and change and further use, collaboratively shared between people and 'stretched out in time' [2].

The workshop is intended for 10 to 20 people. A construction space with tables or benches and an indoor space to fly the constructions are helpful (adapting to local settings is perfectly possible). We supply Depron, Balsa wood, silkpaper, muselin cloth, card board, thin and thick metal wire, wooden sticks of different sizes, straws, profiled sheets of plastic, some hair dryers, a vacuum cleaner, some fans, electric motors, propellers, power sources (lab power supplies, batteries), tape, glue, scissors, cutter knives, rulers, cutting mats, string, pencils, pins, pliers and a saw. Participants are invited to bring material they want to work with, or they find inspiring in relation to fly things on strings.

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