

FABSCHOOLS - Maker Education from Home

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COVID-19 Poses Educational Challenges for Designers

The COVID-19 crisis couldn't be more devastating to the educational field. Learners, families and other caregivers were negatively affected by school closures. UNESCO estimates that around March 2020, at the peak of the pandemic crisis, 1.5 billion learners were affected by more than ninety percent of schools being closed worldwide (www.unesco.org). More than ever, educational strategies need to be adapted and evolved. The Maker community reaction in terms of the PPE Crisis in Hospitals proved the concept and importance of the Distributed Design (DD) proposal. But what about the implications on other areas? How will education be affected and change?

This extraordinary situation led to the adaptation of the Fabschools first activities, now focused on addressing the following questions:

- How can we create more resilient Educational Resources, beyond the digital content and tools exclusively aimed at screens?
- How can Maker Education, and other materiality-based learning activities adapt to these circumstances?

Fab Labs and Makerspaces are cumulative spaces of openness and education that empower a distributed model of design. Fabschools contribution was to come up with strategies that bridge the gap between the design community and the technologies, mechanisms and contents of Maker Education. On the other hand, designers can contribute to enriching the strategies and diversity of approaches used for education in such spaces. Designers are by far one of the best-trained professionals to make the most out of complexity.

Fabschools Project— Distributed Design for Education

Fabschools is in its essence, aimed at testing the robustness of the Distributed Design proposal and its values while addressing the COVID-19

home education context, by exploring diverse contexts where Maker Education can thrive and be useful.

Fabschools is also set on the premise that designers can become key actors in the educational field. These very same creative minds who work hard to tackle problems are now convened to address the application of Distributed Design to a Home Education setting.



Fabschools Deck - CC, Fablab Benfica.

By following its values, they should be able to propose a physical product or lesson, that addresses one or more Sustainable Development Goals (SDGs). Designing Open Educational Products and lessons that are supported by the Fab Labs (Makerspaces) and Schools ecosystem, but at the same time deployed and used at home is also part of the game. This challenge is posed to the design community in general through an open call (fabschools.pt) but also to our research team when scouting for projects, applications and best practices.

A Deck of Cards

As we kept identifying suitable characteristics from projects and initiatives that fit into the Fabschools call, it became evident that we needed to develop an evaluation system that would also rely on an open process and consequently on distributed design. The first tool being developed is a playing cards deck divided into four main sets: Openness, Ecosystem, Education, Sustainability.

The deck serves two purposes:

- The assessment of projects at any point of its development;
- As a co-creation tool, allowing interdisciplinary design teams to gather around a table and brainstorm their way to a solid set of design premises.

The entire deck rehearses a gamification strategy where points are attributed or taken if some characteristics are identified. The best score is meant to recognise the best Fabschools “Making Education Makers at Home” fit.

Openness assessment is based on a pool of intellectual property restrictions:

Firstly, by clearly setting the main objective of sharing from complete appropriation, allowing full flexibility of use to a simple non-restricted usage but not allowing any change or contextual adaptation. After that, our designer/player is invited to reflect on the way the work is being shared. Under what conditions? Highly inspired by the modularity of Creative Commons licensing, we transformed each restriction into a subtraction card (www.creativecommons.org). So, if a designer intends to impose a non-commercial or a share-alike limitation, the level of openness will decrease, and that restriction will lower the overall score. Lastly, we incentivised a reflection about how the work is being shared. The documentation media is essential, and there is no point in sharing a fully open work if no one will know how to proceed, how to adapt or if no information or source files are sufficiently available.

Education is an area where openness can play a crucial role. The success of many examples of Open Educational Resources (OER)²¹ shared, translated, adapted and remixed throughout the world is the best example of its importance (www.hewlett.org).

Describing the Ecosystem is about mapping the stakeholders in the project. For the COVID-19 crisis context and the “Maker Education at Home” challenge, this stage will allow us to perceive how to get the product or lesson home, and even to figure out if it is a product aimed at “all homes” or whether just a few will be able to access it. Understanding who does what and through which channel that works or where resources are delivered is essential. Our proposal is to map the dissemination, and the commons or business model behind the implementation of the project.

Educational potential is addressed by looking at three main dimensions: context, educational output, and goals. Regarding context,



Fabschools Cards, CC, Fablab Benfica.

we expect to value products or lessons used both in formal education (e.g. kindergarten, an elementary or middle school, in person or remote situations) or informal contexts (e.g. community activities, workshop, free play, games or learning applications). Concerning the educational output, we are looking at how the product or lesson promotes explicit or implicit learning. With the third dimension— goals— we are looking to see if the product or lesson promotes learning of contents, subjects or techniques and/or development of skills.

Finally, the Sustainability set plays a double role in the overall assessment. If we look at it from the fabschools call perspective, as it serves both as the theme/content and also as a central value to any distributed design. To enable this, we designed a set of cards that invites the user to choose one or more SDGs that are recognised or perceived by the learner when following a lesson or interacting with a product. Parallely, the designer needs to perform a sustainability evaluation of the project, mainly by looking at the life cycle of the product.

Talking to the Community

The first iteration of this “Creation Deck” led us to a set of workshops aimed at onboarding the community in the development of this tool, by calling various actors to contribute to its development. The first workshop was led by our core team at the last FabX conference. The tool was very well received and perceived, as well as the remote workshop format, based on the Miro App whiteboard. We believe that the format of the cards workshop can incentivise the generation of new DD for Education proposals. We also started a series of interviews with designers that we believe developed products or lessons which are sufficiently deployed and successful to test the efficiency of this tool.

The self-assessment component was particularly impressive with two projects: Alquimetricos (www.alquimetricos.com), a project we have been using as reference, and that inspired many of the premises we are associating with the “Making Education Makers at Home” call. Fernando Daguanno, the leading designer and activist behind Alquimetricos, got a maximum score. Besides that, his remarks and comments will be precious for the development of our next iteration. In his opinion, a strong point about Alquimetricos is the development ecosystem and the openness of this very same ecosystem. Fernando believes that the economic sustainability model is also a matter of design, which in their case is also documented and published under a Creative Commons License, allowing others to be inspired by it and apply or adapt it to their proposals. Of course, we are talking of a highly mature project that pinpoints most (if not all) of the Fabschools main goals.

Another interesting interview was the Mariana Costa e Silva one. Her project— “Faz com as tuas mãos (Do it with your hands)” derives from her designs to a workshop setting (www.marianacostaesilva.com/faz/). An informal group of community members and their children are invited to collaborate on the manual fabrication of her models. These models are precisely thought to apply the most basic methods of production, yet unfamiliar for most of the children. The educator and the under-12 learner are invited to experiment with the usage of manual saws, nails and hammers. This is particularly interesting from several perspectives: from the acknowledgement of the work behind an object, to confidence-building by using the tools that safety restrictions took away from the traditional school system.

But Mariana’s interview was particularly interesting for the openness debate and all the questions that she raised. Mariana’s anxiety about opening up her design source is similar to most of the traditional design education perspective, mostly based on the conventional intellectual property valorisation and economic model. In any case, she acknowledges the importance and impact of opening her work. Yet, some unsolved questions about the model remain.



Alquimetricos, CC, Fernando Daguanno.

The interesting aspect from a research point of view is that we might immediately find an answer by relating both interviews. In any case, it is very premature to extract any conclusions since the interviews and workshops will proceed to a more systematic phase. On the other hand, we find consistency and potential in the model we are developing, as well as the capacity of integrating other’s contributions. In any case, the Fabschools deck is a potentially Distributed Design²².



"Faz com as tuas mãos" Chair, CC by nc nd Mariana Costa e Silva.

Next Steps and Goals

Fabschools is just starting. We believe to be following the dream of many others who like us promote Maker Education as a natural complement for the traditional school setting. Also, like many others, we were surprised by the crisis. It interrupted our everyday living and consequently, our way of educating and learning.

Incentivising and promoting DD for Education can't just be based on a static catalogue. Fabschools needs to support communities and platforms by supplying them with tools such as the Creation Deck or by disseminating the initiatives within partner schools and creating the ground for more successful project development. Fabschools should assume the role of field test facilitator by incentivising the creation of Fablabs or analogous structures inside schools where the impact of these projects in the educational contexts can be tested, observed and perceived.

It is also essential to acknowledge all the partners who are supporting the project. More specifically, Wikifactory²³ and the Fab Foundation, through Scopes-DF²⁴ who have been crucial to the success of the call. Their importance is infrastructural. We can't have Fablabs nor Fabschools without them. Our goal is to keep looking and partnering up with existing platforms, contributing to their growth. We still can't clearly define specific quality standards, nor best-practices in terms of OER in the field of Maker Education. Nevertheless, we are sure that this can't be studied without the collaboration of these platforms.

We believe that by iterating curation, dissemination and gathering data from local implementations and field tests, we will be able to produce recommendations and contribute to setting up best-practices in terms of Maker Education projects. Fabschools will want to promote more research and look at how educators or a community can make the best out of all resources available.

Finally, we expect to look at all this from a more profound research perspective establishing more international partnerships aiming at sharing knowledge and practices that articulate education and design.