OPENNESS IN DESIGN EDUCATION
FROM OPEN SOFTWARE TO OPEN HARDWARE

1. PREMISE

Over the last 20 years, terms such as Free Software and Open Source are populating
our digital experience. Other than small ideological distinctions, both are defined as
the legal freedom to use, study, distribute and modify a piece of software (Stallman,
1985). In the beginning, these terms were attributed exclusively to computer code.
Today, however, the idea of free access is applied to a wide variety of meaning and
contexts. In 2010 Ronen Kadushin coined the term Open Design, inaugurating what
later would be identified as the transfer of this open philosophy from software to
hardware and subsequently to product design. In this new environment, project
sharing is the key to speeding up the innovation process, and promoting a broader
access to products through self-production. Within this panorama, a new typology of
designers is taking shape: the "Remixers". A Remixer is someone, not necessarily a
designer, who is comfortable with a new design process that doesn't start from
scratch but utilizes existing open material, builds upon it, and sets up a mutual
exchange with the global community. The Web became indeed the ideal marketplace
for this new approach, representing the place where resources are stocked and
shared. The Digital Natives, or the Net.Generation (Junco, Reynol; Mastrodicasa,
Jeanna, 2007), are the main users of this huge amount of material available on the
Internet's infinite shelves. So far, great attention has been dedicated to educating
students to surf smoothly between the on-line waves, to conduct appropriate
research, to be able to judge between truth and lies, and to wisely use the full
potential of big data. What has not been taught to them yet, however, is how to deal
with this open and free new context. I'm speaking about growing sharing skills,
helping them to reconsider their idea of property, and to look at the Global arena as
a sustainable advantage. A new paradigm should be added then to the design
education agenda to prepare students to front this openness.

2. UNLOCKING CREATIVITY

Utility patents are generally valid up to 20 years. Design patents go from 15 to 20
years from the date of issue. In Japan, an applicant can request a design to be kept
secret for a period of up to 3 years after the registration has been granted. This
means that some ideas are locked in a strongbox, getting old, dusty and losing
precious development potential. Let's consider the example of open source
software: every single hour, all around the world, millions of developers are
updating and contributing to the improvement of a single string of code; every
single month hundreds of new releases are presented to the masses. Sharing is one
of the main pillars that underpin the open design philosophy and high innovation
speed is its embedded consequence. Now that hardware has become part of the
open game too, it is clear how far the traditional design patent model is from the
present and the future of any design activity. Creative Commons (CC) is a non-profit

organization that provides free legal tools to give the public permission to use creative works introducing a doable alternative to the traditional licensing options. Standard copyright law, so far, denies any possibility to "copy and paste" without proper authorization. If someone wants to share any personal creation, he or she must declare it and, through CC, select between different licensing options: from no commercial (it allows the copy and the alteration of the original Idea but not its commercial use) to no derivates (the copy is allowed but without any alteration of it) to share alike (who gets the material has the limit to pass it under the same licensing mode). Authorship is clearly at the foundation of all this discourse and "be open" shouldn't mean in fact giving away personal creations forgiving credits and intellectual property. Design students should become familiar with "who did what" or "give and take" principles as an essential ethical requisite for running the sharing machine.

3.   LEARNING TO SHARE

Specific exercises could be done to develop some sort of inclination for sharing. The activity illustrated below, titled "design for sharing", wants to demonstrate how an ideas-sharing environment can foster a fast, convenient and rich creative process. The assignment was organized in two major phases. During the first phase, the students individually developed their ideas following a traditional design process. Successively, they were asked to pass their projects to someone else who would be in charge of developing their idea further. This passage of the project from hand to hand is a valid method to highlight the need for clarity when communicating our plans. Moreover, the reciprocal permission to upgrade, modify, implement or simply steal part of the given original proposals, works as a valuable exercise for accepting a new definition of ownership. In this way, students get rid of the archaic constraints of private property and experience a new design approach featuring a game with multiple players and no limitations or boundaries. The quantity of ideas produced during this creative ring-around-the-rosie, in which new contributions are added to pre-existent ideas, and the speed with which ideas evolve and improve, proved to the students the validity of this new way of operating. The learning curve for any collaborative process is always steep but regarding open processes the task could be even steeper; "Are we designers ready to let our own creations free to evolve and change in others' hands?" Every design consists of the time spent on the choice of a specific color, on finding correct proportions, on balancing carefully each element and this is all mixed with personal style, taste, and feelings. Is clear then, that even if the open design system might provide great potential, it requires designers to develop the ability to merge traditional design individualism with altruism and generosity. The majority of students, who dream of being the next design star, could see this new role with a certain skepticism. Two factors could assist educators in the difficult task of getting this message through. First: the endorsement of group-based collaborative projects that are not focused only on a traditional co-creation mode, where different individuals work on the same problem to work out a unique solution, but where students work on a sequence of individual creative acts where the result is the last evolutional step of distinctive solutions. Authorship is the other

fundamental element to address: teaching students the importance to attribute intellectual property or to distinguish original content from derivatives is the key to building responsible and respectful future design professionals.

4. LEARNING TO COPY

The panorama of on-line free resources is enormous and the first important concept to address is the semiotic difference between free and for free. Ethics plays an important role in this kind of environment; it is true that everyone can legally download a lot of material for free, but is equally true that each individual must actively participate in giving back to the system. Instruction on how to build a radiation sensor, how to assemble a kite or how to design and 3d print an engagement ring, all of this is nowadays possible and available on different design sharing platforms. There are websites, DIY movement outposts such as instructibles.com or howto.com where a student can find instructions to build or fix almost anything, both digitally and analogically, from code to nails. Other websites focus on 3d printing and digital fabrication where you can share, produce and even sell your own creations (e.g. ponoko.com, thingiverse.com, shapeways.com); Thomas Friedman recently wrote in the New York Times "Today because knowledge is available on every internet-connected device, what you know matters far less than what you can do with what you know" or as Jean-Luc Godard affirmed "It's not where you take things from- it's where you take them to". These two quotes highlight the need for students to embrace another way to design: not only designing from scratch and following the fantasy of a truly pure originality but also not feeling guilty to copy and mix fresh ideas with existing material. An open process differs from a traditional process mainly because projects don't stop with a polished outcome but are considered done only after the editing of the instructions and the handling of the source material by the entire community. In this way, students shift the emotional phase of the project's conclusion from individual achievement to collective joy.

5. THE GLOBAL CRITIQUE

Blogs, social networks, and web communities represent easy and incredibly fast ways to reach a massive audience, exposing ideas and thoughts to global feedback. Even if Internet participation inequity is still close to the one percent rule (Ben McConnell and Jackie Huba, 2006), meaning that for one percent of creators, there are nine percent of contributors and ninety percent of "lurkers", the potential for feedback and critique is still much larger than any traditional in-person debate. Everyone is at ease with the net crowd, very familiar with "like" and "share", and very comfortable in commenting, suggesting and expressing themselves in front of thousand of "friends"; but speaking about design and professionalism is clearly different. The following example could help to better understand the importance of feedback and the meaning of responsibility in open design processes. One exercise related to the teaching of open practices is to invite students to upload their creation on-line and share it within open design communities. The project, part of this case

study, was a desktop stand for an IPhone. During the class presentation, one of the students provided a 3d printed prototype, but the dimensions were a couple of millimeters off and the phone wouldn't fit properly. At that point, the project had been on Thingiverse.com for nearly two hours. Within that brief period, two hundred people viewed the object and a dozen downloaded it. When the student realized the consequences of uploading a flawed file and the possible flow of bad feedback and comments from the informal, and often not clement, Internet community, she started trembling behind her computer screen. A few seconds later a message appeared beside the project: "WARNING: cover is flipped, and a little bit smaller than the phone - the actual file will be updated soon". Unlike a personal blog or Facebook interaction, where the only risks are related to self-reputation, the sharing of a design project, files and instructions have entirely different consequences. Even if the real and ultimate responsibility belongs to the one who decides to download the material or follow the instructions, even if the projects can be modified and customized, when the person who "uploads things" is a designer, a proper ethic and a sort of social responsibility is absolutely necessary. The community itself is the organism in charge of judging an idea, verifying the correctness of the data and contributing to the idea's development. A good method to teach students how to deal with a global critique is to invite them to have their own blogs where they can upload their creations and receive comments from classmates and professors. In addition it would be useful to set up a blog-based review system to enhance critical awareness and personal opinions.

6.   SPACE AND TIME

Openness means overall collaboration - with classmates, with the web community, or with people on the other side of the world working on the same design problem. Openness also means creating and designing with the goal in mind to speed up innovation and to improve both the quality and the quantity of the shared knowledge. The following example will illustrate a research project based on a global collaborative design process. The exercise involved three different Universities: Virginia Commonwealth University Qatar, VCU School of the Arts Richmond US and RMIT Melbourne Australia. The brief was to develop a topic for 48 hours that, taking advantage of the different time zones of each institution, allowing six sessions of eight full working hours. The three teams, working sequentially on the topic, passed the project to each other, uploading their outcomes at the end of each daily session. "How fast could an idea grow and improve if left running freely around the world for 48 hours?". This was the question we answered during the 2-day worldwide design workshop. From Doha to Richmond, from Richmond to Melbourne and from Melbourne back to Doha, the idea traveled across different continents, cultures, skills and behaviors. Everyone in this design cycle was allowed to modify, upgrade or refine the last design release. When working with people thousands of miles away, the need to provide understandable material and clear information are paramount. This is especially true if, due to different time zones, the one with the ability to provide an explanation is blissfully sleeping. The project was very engaging and the early morning excitement in seeing what had been done

during the night by the other two teams was unexpectedly thrilling. One of the main features of "The Time Machine", the name given to the workshop, was the continuous switching between global and local. Customization is one of the fundamental components of Open Design projects and the understanding of how to valorize globalization, cleaning up the term from its bad reputation, and match it with responsible personal solutions, is another key factor in empowering the next generation designers.

7. CONCLUSIONS

Here are a few crucial points, extrapolated from the different experiments and case studies mentioned in this paper, for the introduction of the idea of "Openness" in design education.

Learn to Share.
Designing for our selves is very different from designing for sharing. Especially in the creative field, where part of the creation process is often interiorized and personal, it becomes crucial to learn a common design language and become familiar with acting in a collaborative environment.

Let it go.
Accepting the fact that our own ideas run away, as young adult sons, is not easy or painless. To renounce a genuine self-celebration takes time. Watching others building on our initial ideas and taking advantage of our intuitions can be very frustrating if the meaning of the bigger picture is not loud and clear.

Take and give.
Within the Open environment and the universe of free resources, there is an indispensable and strong ethical self-responsibility. The Open System is based on mutual contribution and the quantities of inputs and outputs should be even. Moreover, the recognition of authorship is the system's entrance fee.

Global plus Local.
Using global knowledge and global resources to escape from the one size fits all model means being able to filter, criticize and digest the Internet magma and transfer it to local issues. Virtuality has to be wisely mixed with reality. Every developing model, from agriculture to economy to education, shows us that the "just copying mode" does not work. Proper analysis and interpretation are always needed.

Being Open is a journey that takes much longer than merely claiming it, and the introduction of this topic into design education is an essential step to grow in future designers a deeper sense of awareness and responsibility.

8. REFERENCES

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