Design Education at the Cross-Roads of Change

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Abstract. The paper advocates for designer immersion while deploying design research methods and design leadership within teamwork. Design educators need to prepare students to take on these roles with confidence, while working at the crossroads between business, culture, design and ergonomics, as well as other specialties according to the nature of the problem at hand. Are there ways design education can support individuals in valuing their uniqueness and transforming their passion and drive into competitive advantage? By helping them develop the curiosity that is needed to discover and select meaningful problems, preparing them to understand context, human activities and the aspirations of the person and of society, educators can get them posed for transformative and actionable creativity that students will then be more likely to engage in, and therefore enthusiastically generate, create and develop relevant and inspiring solutions.

Keywords: Attitudes · Design stages · Design education · Metaphors

1 Introduction

This paper is based on an invited talk delivered by Denis A. Coelho, Professor at the University of Beira Interior, delivered February 1, 2016, at the School of Design of the Hong Kong Polytechnic University.

This (Fig. 1) is a metaphor to the changing world we live in, and to the cycles it inevitably goes through. With this call-up, we intend to juxtapose the movement that is taking place in our world to phase-out fossil fuels, replacing them with renewable energies and capping over-consumption of resources with an even more radical movement of going back to basics, that advocates for rural renaissance, and for a return to a mostly agrarian subsistence model, closer to self-sufficiency, even though this may be seen as a throwback in terms of human and economic development. We think that it is possible to combine these two perspectives and that somewhere in between there is a middle ground that we should collectively seek and work together to jointly achieve. There is definitely a lot of transformation heading our way, we have a choice to either react to it as it happens or we can honestly try to take the lead on change and position ourselves in the frontline or ahead of the fundamental changes that are bound to occur in our economic and social systems. Many people believe that designers are potentially

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Fig. 1. Undated black and white stock picture taken in Kent, Oregon

well versed in the knowledge and in the skills necessary to become leaders in this transformational process, requiring forward looking, focusing on problems, working across disciplines, participating in teams and leading them by example and inspiration, while also adopting a systems perspective and focusing on people.

In its latest redefinition of industrial design the professional practice committee of the International Council of Societies of Industrial Design stresses that designers must be well versed in acquiring "a deep understanding of user needs through empathy and apply a pragmatic, user centric problem solving process to design products, systems, services and experiences". This is where we have contributed to the discipline of Product Design, leading and offering guidance and support to design students in placing the person at the centre of the design process. However, this focus does not entail a detachment from the context, the activity, or the systems perspectives. On the contrary, we strive to get past the often misleading assurance conferred by design requirement specifications, and get our feet on the ground and carry out fieldwork, such as that which is involved in systemic analysis, making use of ethnographic methods to enrich our systems perspective and to foster the creation of real and shared value. Hence we advocate for designer immersion while deploying design research methods and design leadership within teamwork, hence as educators we need to prepare our students to take on these roles with confidence, while working at the crossroads between business, culture, design and ergonomics, as well as other specialties according to the nature of the problem that is at hand and is being tackled.

This is not an easy task and there are many challenges that we encounter in a design educator role. A few of the questions that we are bound to ask ourselves are: How do we not only show them how to design but also get them on their own path and possibly guide them and especially nurture their own trailing of the meta processes through which as individual design students, they flourish as designers and become independent, resourceful and self confident in their abilities and power to change the world, one design at a time? So are there ways design education can support individuals in valuing their uniqueness and transforming their passion and drive into competitive advantage? By helping them develop the curiosity that is needed to discover and select meaningful problems, preparing them to understand context, human activities and the aspirations of

the person and of society, we can get them posed for transformative and actionable creativity that they will then be more likely to engage in, and therefore enthusiastically generate, create and develop relevant and inspiring solutions.

2 An Internal Design Compass Metaphor

When a design process is driven by love and passion you can see it in the results, and when it's not, or something gets in between, hijacking it from that truthfulness and wholeness, the results tend to give it away. So, a combination of technical skills and abilities and passionate drive to design which we expect in a product and industrial designer must be balanced and placed in an internal and external dialogue throughout the design process. The paper suggests thinking metaphorically of an internal compass that will help to strike the balance in this skilful, artful and technical process of designing. This metaphor is presented in detail in this section.

Each project and each individual designer benefits from developing a tailored approach and a bespoke design method. I see my role as a facilitator helping individuals unleash their creative power, helping them find their uniqueness and establish confidence in their creative abilities and be willing to take risks in an unorthodox creative stance, tapping in to their inner creative fountain and assisting them in structuring the design process. Recognizing the need to adopt different attitudes and engage suitable abilities throughout the process directs their sage power to the actions conducive to success in the stages of the process. So, let me start with tuning in, empathizing.

2.1 Tuning in

To be able to appreciate the uniqueness in our surroundings and the authenticity of those we interact with and appreciate their differences, respect them, understand them, we need to know ourselves fairly well. In a design context this could be fostered by product personality profiling and even individual personality, team building exercises and games such as "visualize the inner child" in the interactions with others, to foster empathy and tuning in to their reality, aspirations and problems. As an example, consider Fig. 2, depicting a project which was actually built on her personal choice to empathize with young children and articulate sustainability in toy design methods.

2.2 Discovering

The next attitude I would like to bring up is the "exploring" and discovery mode. Observing and engaging in fascination for the new findings whether brought up from literature or from explorative field work or even more structured approaches from ethnography in a more external dialoguing and contemplative attitude. This might involve getting immersed and following what is interesting in context. Don't hold back, dive in as much as possible, let the world fascinate you and then map it and pin point problems.

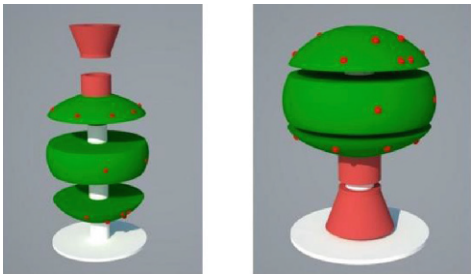

Fig. 2. Toy design concept developed from empathizing (Fernandes & Coelho 2013)

In this project (Fig. 3), the student wanted to work with his original territory. This map is the result of the systemic analysis of a semi-artisanal cheese production process, with inputs, outputs, flows, wastage and those red areas which are critical points. And then a few of those critical points were tackled by different design students – the design of the pens where sheep –big horned ones are milked, a new direction for the logo design (there are many small producers, there is a problem with identifying the certified original authentic product at the point of sale), and a hand tool prototype to improve the quality and the ergonomics of the manual process of excess cheese chip removal at the cheese dairies necessary for homogeneous ripening of the cheese.

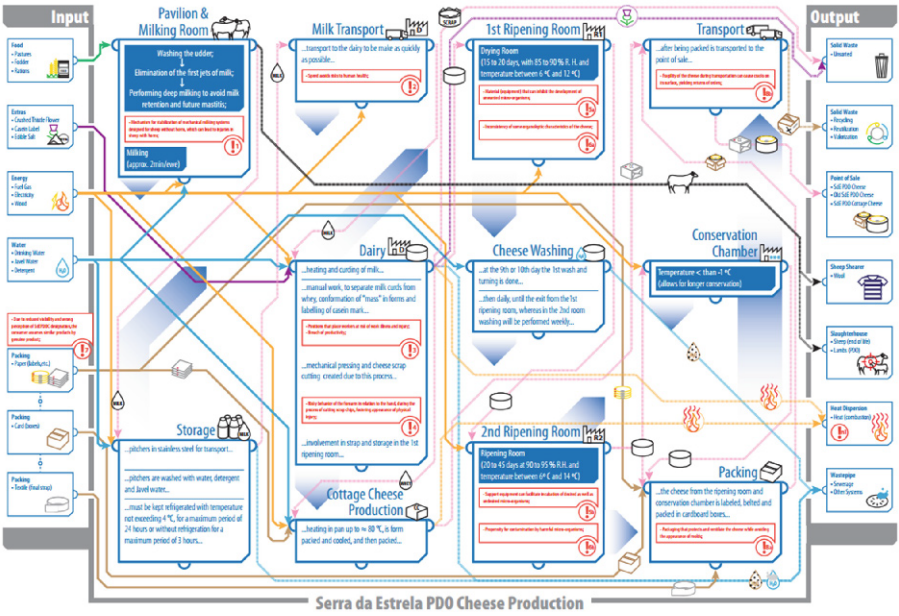

Fig. 3. Systemic design map example (Carrola, Couvinhas & Coelho 2014)

2.3 Flowing

And now we have flowing, sparking innovation, generating alternatives and focusing on positivity to get meaningful results. All the interdisciplinary building blocks at the basis of product design education and the empathic understanding and discoveries previously accomplished really support generating a stream of conceptual solutions embedding positivity and hope, springing from this attitude of flow, tapping into your inner creative fountain and letting the innovative stream boil over, while looking out for the constructive aspects of each idea and adding on and building upon those in succession.

In this project (Fig. 4), the student, a car design aficionado, explored in several iconic roadster models how the drive technology and solution had constrained the design of the car body, and then went on to conceptualize a solution aiming at dealing with the range anxiety problem for electric vehicles (EVs), but keeping a systems perspective, so this concept combines car design, with modular ergonomic batteries and quick exchange stations with some automation (varying degrees conceivable) and a digital network system for booking and capacity management.

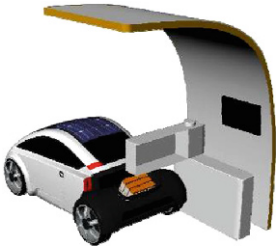

Fig. 4. System design: EV, batteries and infrastructure design (Camboa & Coelho 2010)

2.4 Choosing

And now we have "choosing", since multiple paths or concepts are available, navigating them from an inner perspective keeping an eye out for those choices that inspire and arouse emotion, of course refining towards satisfying any other applicable requirements which might involve validation efforts, e.g. usability evaluation of functional prototypes, or focus groups on scenarios, or other feasibility studies, but those aren't really the only important ones, not if something truly novel is to emerge from this process.

These are two streams of the same culturally inspired design project (Fig. 5), the top half was created by one student who worked from literature, making a survey of Portuguese culture and Portuguese speaking countries culture, and then she used the product personality assignment technique to transfer the more flattering cultural attributes into product features. Another student made a collection of existing iconic designs in the same cultural areas and compared these with established design icons from other cultures (Italy, Scandinavia, Germany), and she went on to isolate the differentiating unique aspects of Portuguese and Lusophone design and these are some of the design concepts springing from this other stream in the project.

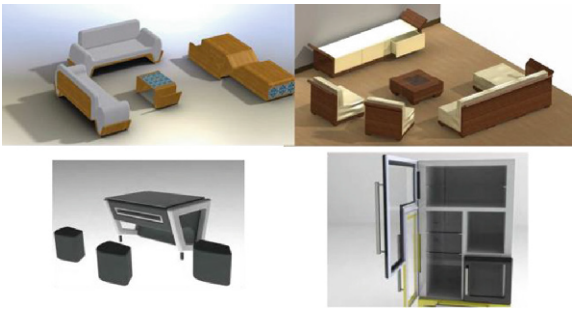

Fig. 5. Culturally inspired design (top images: Cunha Silva & Coelho 2011; bottom images: Simão & Coelho 2011)

2.5 Developing

And now we get to the stage of "developing", which is something typically associated with the work of a product designer, bringing in additional human factors and ergonomics knowledge, drawing, detailing, prototyping, building mock ups, conducting user trials, modelling, presenting, more design research, protecting and communicating the results of the design process, working like busy bees going on from task to task, giving it all and bringing others on board to share a vision and tap into their specific skills complementing your own skill set (Fig. 6). So this is I dare to say the most active and energetic attitude in the whole array of design stages. You summon your abilities,

Fig. 6. A representation of the plethora of development activities in product design (patchwork illustration by Denis A. Coelho & Tiago E. P. Carrola, based on stock images)

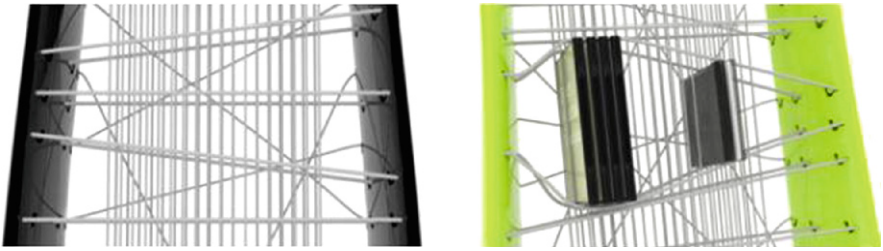

Fig. 7. A bionic design project example (based on the method presented by Versos & Coelho 2011)

Fig. 8. Representation of the internal design compass metaphor: from top centre and clockwise: Tune In, Discover, Flow, Choose and Develop (patchwork illustration and artwork by Denis A. Coelho & Tiago E. P. Carrola)

setup support, activate your execution and leadership skills, get to work developing your design, coordinating everybody else, but checking back regularly on your context and potential users to assure your detailed solution remains faithful to its inspiring essence and then work harder to bring it to the world, whether as entrepreneur or with the support of crowd-funding or other solutions.

This is a biomimmicry design project (Fig. 7). We tackled bionics from the methods at first and then developed a two pronged approach and took it to the application level. One stream flowed as a process going from a problem (stacking of books and discs) to a solution sought with inspiration from nature (spider web). In the lower stream (depicted in Fig. 7), we worked in the opposite direction, starting from the natural structures in bones and trees and looking for an application where the combination of strength with elasticity and resilience would be relevant, and this design, is only achievable through additive manufacturing, like 3D printing of suitable polymers (it is designed for a corn based natural polymer that is biodegradable).

3 Conclusion

Naturally, reiterations, moving back and forth, shifting attitude according to the advances and setbacks in the design project are contingent to this compass metaphor (Fig. 8), hence the central checker board that represents the possibility of any kind of moves.

To wrap-up, everything I said so far about the design process is easier said than done. That is why design students and young designers need advisers to help them sort the complexity out, focus on what they are good at and help them to bootstrap their passion placing it at their service so that it may self-sustainingly pull themselves farther.

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