CODEC
New education model(s)
Future of design education
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CODEC'S RESEARCH PROJECTS ARE BASED ON VICTOR PAPANEK'S THOUGHT:

"THE ONLY IMPORTANT THING ABOUT DESIGN IS HOW IT RELATES TO PEOPLE."

CONTENT

01

BRIEF

Whilst examining the field of design in relation to society, the newly established design collaborative CODEC recognised the following topics as an important subject for research: new management models, collaborative networks, new financial and business models, new knowledge exchange models, and new education models.

Section One (the brief) presents the backbone to the study of new *design* education models: background, problem statement, research topics, and methodology.

1.1:

Background

The turn of the millennium witnessed many fresh strides toward a new thinking in design education. In his 2001 text “Rethinking Design Education for the 21st Century: Theoretical, Methodological, and Ethical Discussion” (2001: 13), Alain Findeli specified three priorities for the design field:

- a discussion on the purpose of design,
- the reform of design education, and, as
- there can be no responsible design without a responsible designer, ... the development of an individualistic ethics.

In her text “On care and education”, Susan C. Stewart wrote: “Among these valuable dispositions is the designer’s acquired orientation to the pursuit of attentive and open-ended inquiry into the possibilities latent within the material context. A second promising characteristic of design is its restless dissatisfaction with answers. Expert designers are addicted to iterative projection and critique.” That is why, according to Stewart: “Design will certainly be a key player in our unfolding future. Whether or not it plays to good effect will depend upon the possibilities that blossom within its own practices, carrying it in new directions.” (2015: 275–276)

The report on new educational *design* models challenges both key notions presented above. The report’s primary goal is to inform and provide a guide for future strategies in design education, in order to ensure the beneficial impact of design as a key player in our unfolding future.

1.2:

Problem statement

As we all know, we are living in a rapidly changing society. The world has and will always change and will change without warning. That’s nothing new. Design was and is a vital part of this change. Nevertheless, for some time now, we’ve been reading about predictions and warnings that design is lagging behind. Instead of offering solutions, it is more and more recognized and described as part of the problem: not willing or able to confront the full force of current ecological and humanitarian crises.

Victor Margolin wrote that it is possible to reinvent design, if the will exists among designers. “If it doesn’t, designers will simply remain part of the problem whose solution other professions will need to invent.” (2002: 102)

The imperative is simple: the design profession, with education as its vital part, has to be able to recognize the roles it plays and might play in society and from these roles develop new skills and tools, new knowledge, new educational models. The idea is to help create conditions for better integration of different disciplines and to redefine the competences of the design profession in the construction of a better society and its future.

1.3:

Research topics

Understanding our unfolding future was vital in defining our search. The latter questioned two perspectives on design education:

01. **Design education as a profession**
What skills will a future designer need? Which (new) education models we will have to develop to achieve and master these skills?

02. **Design education as a general “tool”**
What design skills do we all need (not only professional future designers)? Which (new) education models will we have to develop to achieve and master these skills*?
**Disclaimer: We are thinking about skills we all need in order to rebuild our world in a more sustained way.*

1.4:

Objectives and methods

Our objective is defined by the main question, which is not *how*, but *what*. What do we want to achieve with new educational models? Or more importantly: What is our vision of a (preferred) future? What kind of designers/citizens do we *need* in order to develop these better societies? And of course, what type of education do we need in order to achieve this?

After answering that, we can proceed to reconsider how: Which new models do we have to develop in order to achieve the set goals?

1.5:

Definitions

In this text, the term *design* is used as outlined in the chosen definitions of (most inclusive) designers’ activity and, in turn, the field of design.

“[Students] should be trained not only to solve problems – but what is more important, they should be trained to help others solve their own problems. One of the most valuable functions of a good industrial designer today is to ask the right questions of those concerned so that they become freshly involved and seek a solution themselves.”
— Charles and Ray Eames, *The India Report*, 1958

“Everyone designs who devises courses of action aimed at changing existing situations into preferred ones.”
— Herbert A. Simon, *The Sciences of the Artificial*, 1969

“All men are designers. All that we do, almost all the time is design, for design is basic to all human activity. The planning and patterning of any act towards a desired, foreseeable end constitutes the design process. Any attempt to separate design, to make it a thing-by-itself, works counter to the inherent value of design as the primary underlying matrix of life.”
— Victor Papanek, *Design for the Real World: Human Ecology and Social Change*, 1971

02

CONTEXT

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The first part of Section Two is a brief introduction of selected theoretical notions on our current view of education, which is defined by our neoliberal and globalized world.

The second part of Section Two focuses on the current (lack of) understanding of the changes that our society and environment are to undergo in the next 25 years. It is vital to understand the changes that await us, for they will have a profound impact on design education as a profession, as well as design education as a general “tool”. The context provides the relevance and the nature of the research problem.

2.1:

A brief theoretical background

To today's world of identities as opposition, the French philosopher Alain Badiou offers a world of encounters. Here is how Badiou answers the question *What is an encounter?*: "It is a contingent, chance element of existence. Something happens to you that nothing among your existing world's points of reference made likely or necessary. You encounter someone who you do not know and yet who strikes you, attracts you, enters into your life."

in his book *In Praise of Love*, Badiou warns there is no encounter without risk. But, "if you try to reduce this insecurity then you destroy the encounter itself," you destroy the chance of a beginning, the chance of the potentiality of the possible construction, or – according to Badiou – the chance to "rise to shared consequences, shared innovations". (2014)

Power is thus in the potential of the encounter. With that, when we share knowledge on the basis of encounters, we create the possibility of new know-how. Each new know-how then raises the standard of knowledge. Precisely the latter – the standard of knowledge –, is today in a greater extent constantly being put to the test. Just as Slovenian philosopher Mladen Dolar warns, "the massification of the university created a general decline in the standards of knowledge. [...] Dragging along with it the commercialization and instrumentationalization of knowledge. It has become attached to the demand that certain results be produced on the marketplace." (2017)

The demand for results goes hand in hand with the current prevailing social system, capitalism. It seems universally acceptable that capitalism as a system constantly emphasises the need for new knowledge, for critical thinking. Everyone is also aware of the political catchwords, that we are living in a society of knowledge, in an information society. It must be stressed that it is not about the celebration of knowledge in general, but it is about the search only for that knowledge which bears results, that knowledge which is able in the shortest possible time to transfer into the economy. A demand for knowledge that provides the possibility of application, all with the goal of separating so called *useful* knowledge from the *non-useful*.

Useful knowledge also automatically establishes the measurement of knowledge. And that is despite the fact that knowledge requires independent criteria, independent standards. Independent standards raise the demand to reject the *status quo*, when knowledge – as Dolar mentions – is all the more "subjected to an evaluation that happens a bit like the model of credit rating agencies and measures everything except that which is essential: 'the sharp cut of the real', as Lacan said." (2017)

2.2:

Possible future(s)

"This is the most dangerous time for our planet."
— Stephen Hawking

There are a number of reasons why it is high time for the inhabitants of – as Buckminster Fuller called it – Spaceship Earth, to think about the need to collaborate, the need to share and work for the common goals that connect us and, even more importantly, sustain us. Sustain *us*, as a species, and all other living organisms around us. According to Stephen Hawking, we will soon have to "face awesome environmental challenges: climate change, food production, overpopulation, the decimation of other species, epidemic disease, acidification of the oceans". (2016)

Hawking places before us a selection of exceptionally complex problems with which we as a society will be forced to confront and also, according to our own possibilities, solve. This complexity and omnipresence indicate that it will not be possible to solve these problems only with a selected, highly-educated specialised elite (undoubtedly, professional designers also belong among them). But in order to successfully solve the aforementioned problems it will be necessary to empower every single individual with a knowledge of design. In the continuation of this research we will

demonstrate that design is an integral part of each solution (Section Four).

Below follows a short overview of the main concerns that the aforementioned strongly interconnected challenges are raising, or will soon give rise to.

01. CHALLENGES: Climate change, food production, water scarcity and migration

In the forward of the report *Climate Change: A Risk Assessment* (2015) The Rt Hon. Baroness Anelay of St Johns, Minister of State at the UK Foreign and Commonwealth Office made the following observation: "It is remarkable that even in the run-up to a general election, the leaders of the UK's three largest political parties came together to say that 'Climate change is one of the most serious threats facing the world today. It is not just a threat to the environment, but also to our national and global security, to poverty eradication and economic prosperity.'"

According to the report the risks of climate change are non-linear: while average conditions may change gradually, the risks can increase rapidly. Among direct risks aforementioned report acknowledges the following:

- On all but the lowest emissions pathways, a rise of more than 2°C is likely in the latter half of this century.
- In future, climatic conditions could exceed potentially lethal limits of heat stress even for individuals resting in the shade.
- When critical thresholds are exceeded, yields may be drastically reduced. On a high emissions pathway, the incidence of extreme drought affecting cropland could double globally over the course of the century under central estimates.
- The number of people exposed to extreme water shortage is projected to double globally by mid-century due to population growth alone. Also the risk of flooding will increase. With 1m of global sea level rise, the probability of what is now a '100-year flood event' becomes about 40 times more likely in Shanghai, 200 times more likely in New York, and 1000 times more likely in Kolkata.
- Many elements of the climate system are capable of abrupt or irreversible change. Changes to monsoons or to ocean circulation patterns, die-back of tropical forests, and the release of carbon from permafrost or sub-sea methane hydrates could all cause large-scale disruption of the climate. (King et al., 2015)

The direct risks of climate change may induce systemic risks like:

- Migration as a necessity could take place on a historically unprecedented scale.
- The risks of state failure could rise significantly. The expansion of ungoverned territories would in turn increase the risks of terrorism.
- The temptation for states or other actors to take unilateral steps toward climate geoengineering would be significant, and could become a further source of conflict.

02. CHALLENGES: Overpopulation and the decimation of other species

"The massive growth in the human population through the 20th century has had more impact on biodiversity than any other single factor."
— Sir David King, science advisor to the UK government

Population Reference Bureau argues that "for the last 50 years, world population multiplied more rapidly than ever before, and more rapidly than it is projected to grow in the future. In 1950, the world had 2.5 billion people; and in 2005, the world had 6.5 billion people. By 2050, this number could rise to more than 9 billion. [...] The growth of the last 200 years appears explosive on the historical timeline. The overall effects of this growth on living standards, resource use, and the environment will continue to change the world landscape long after." (2005)

Even more – according to the Rewilding Institute (2013) – the human population explosion over the last 200 years is the primary driver of today's mass extinction. Harvard biologist E. O. Wilson even estimates that 30,000 species per year (or three species per hour) are being driven to extinction. Extinction is the most serious, utterly irreversible effect of unsustainable human population. (Center for Biological Diversity, 2012)

Another consequence of the planet's warming with the effect of the decimation

of other species is acidification of the oceans. Species from corals to lobsters and fish are succumbing to pathogenic infection. “A lot of marine bacteria, viruses, and fungi grow better at warmer temperatures,” Drew Harvell, an expert on marine infectious diseases and professor of ecology at Cornell University explains. At the same time, the animals they infect are weakened by the hotter temps. “It’s a perfect storm of trouble.” (Wilcox, 2016)

03. CHALLENGES: Epidemic Disease

Up to today, more than 400 infectious diseases were identified and more than 60% came from animals. Pathogens have transferred from animals to people for as long as we have had contact. Domestication of livestock led to the emergence of measles, expanding trade routes in the 14th century spread the rat-borne Black Death across Europe and smallpox to the Americas in the 16th century. Intensification of farming in recent decades has caused problems such as the brain-wasting Creutzfeldt-Jakob disease, the human form of BSE) and today’s tightly connected world has seen the spread of swine flu, Sars, West Nile virus and H5N1 bird flu with the fastest possible speed. (JHa, 2013)

These diseases resulted in the biggest threats to entire population of humans on the Earth (as example epidemic of Ebola virus disease in West Africa, causing at least 11,000 deaths from 2013-2016) because of the increased mobility and global traveling which enables fast spread of the diseases.

In the World Health Organisation report titled *Blueprint for R&D preparedness and response to public health emergencies due to highly infectious pathogens*, we can find an initial list of seven diseases requiring urgent R&D. The list includes: Crimean-Congo haemorrhagic fever; Filovirus diseases (Ebola & Marburg); coronaviruses (MERS CoV & SARS); Lassa fever; Nipah virus; Rift Valley fever. Also listed were three further diseases determined to be serious, necessitating further action as soon as possible: Chikungunya virus, severe fever with thrombocytopenia syndrome, and Zika virus.

Fields such as medicine (Theoretical Biology, Medical Modelling), media, policy planning and technology can contribute directly to improvement of the situation. Better information flow can greatly prevent the spread of the diseases. A good example is *Text to Change* project, sending text messages to provide and collect important information, informing the Sierra Leonean population of ways to prevent the spread of Ebola virus (Beijma, 2017).

04. CHALLENGES: Automatization, Robotization (Decimated jobs, widening economic inequality, Lights-Out Manufacturing)

One story goes that factories all over the world are “applying robotics engineering and other innovative manufacturing technologies to replace repetitive tasks previously done by employees and through training, also enable (human) employees *to focus on higher value-added elements in the manufacturing process, such as research and development, process control and quality control.*” (Wakefield, 2016)

But a starker reality seems to be this: “Nine robots now do the job of 140 full-time workers. [...] The company, which exports 1,500 sinks a day, spent more than $3m on the robots. ‘These machines are cheaper, more precise and more reliable than people,’ says Chen. ‘I’ve never had a whole batch ruined by robots. I look forward to replacing more humans in future,’ he adds, with a wry smile.” (Bland, 2016) or “The Foxconn factory has reduced its employee strength from 110,000 to 50,000, thanks to the introduction of robots. It has tasted success in reduction of labour costs.” (Bolton, 2016)

Many economists and scientists have issued dire warnings about how automation will affect the job market. As mentioned before, in a column written by Stephen Hawking for *The Guardian*, “the automation of factories has already decimated jobs in traditional manufacturing, and the rise of artificial intelligence is likely to extend this job destruction deep into the middle classes, *with only the most caring, creative or supervisory roles remaining*.” The fear is that while artificial intelligence will bring radical increases in efficiency in industry, for ordinary people this will translate into unemployment and uncertainty, as their human jobs are replaced by machines (Hawking, 2016).

2.4:

Between past and future

“Education is the point at which we decide whether we love the world enough to assume responsibility for it and by the same token save it from ruin which, except for renewal, except for the coming of the new and young, would be inevitable. And education, too, is where we decide whether we love our children enough not to expel them from our world and leave them to their own devices, nor to strike their hands, their chance of understanding something new, something unforeseen by us, but to prepare them in advance for the task of renewing a common world.”
— Hannah Arendt, *Between Past and Future*

In addition to universally acknowledged future projections, which are largely based on the assumption that understanding the present situation makes it possible to ponder the future, numerous studies give advice as to the skills that will be considered important for jobs (livelihood) in the years to come. One of the most prominent forecasts of this kind is a list of 10 skills published by the World Economic Forum (Gray, 2016), according to which one will need to acquire (by 2020 at the latest) to thrive in society: 1) Complex Problem Solving; 2) Critical Thinking; 3) Creativity; 4) People Management; 5) Coordinating with Others; 6) Emotional Intelligence; 7) Judgment and Decision Making; 8) Service Orientation; 9) Negotiation; 10) Cognitive Flexibility.

These skills have at least one thing in common: they are (and presumably will remain for at least a few years to come) all skills that the present and emerging automation processes involving robots and artificial intelligence have so far failed to master to the extent people can. In short, these are the skills one will supposedly need to prosper in the coming Fourth Industrial Revolution.

However, all this seems to have come halfway, to have become ensnared in a world where ongoing changes are being acknowledged yet the perception of learning remains the same. In other words, an education system is still in place which only appears to be constantly changing when in fact it remains centred on identifying and acquiring the skills that could be interesting to future employers. Implementing such changes means perpetuating old thinking. Perpetuating an education system which is expected to continually adapt to the demands of the market yet the role of which never changes. Perpetuating an education system the sole purpose of which is to prepare young people for the labour market.

This approach is objectionable for yet another reason. This is an approach that turns schools from educational into vocational institutions. Considering the described complex problems and also all unpredictable challenges that are expected to lie ahead, vocational schools seem all the more unreasonable. What is more, it is precisely due to these premises that learning how to think seems to be the most reasonable thing to do. Accordingly, the purpose of school should be to equip students with knowledge that cannot be *randomly picked up on the street*. This is why the ongoing process of reforming schools into merely practical ways of acquiring knowledge raises doubts. It raises doubts about whether exclusively empirical (practical) learning can truly result in knowledge that is broad enough to allow one to question and change existing situations.

According to Professor of Sociology Frank Furedi, theoretical knowledge matters because, “it can help students to rise above their particular experience and gain insight into the wider world into which they are initiated. This type of formal education has as its premise the understanding that there are real limits to what can be learned from direct experience.” (Furedi, 2016 [2009]: 75) For, “the way the world appears is often not the way it is, we rely on abstract theoretical knowledge to interpret it.” (Ibid.) Or as Michael Young, Professor of Education observed, “because the world is not as we experience it, curriculum knowledge must be discontinuous, not continuous with everyday experience.” (in Ibid.)

2.5:

Education as the “corruption” of youth

In the light of what has been said, attention should be drawn to another aspect or, better still, ability. The ability to question traditions, the ability to question what seems inalterable. The ability to confront universally accepted postulates. This is precisely what the philosopher Alain Badiou underlines when discussing Socrates’ death sentence for corruption of youth. Badiou writes: “Essentially, to corrupt youth means only one thing: to try to ensure that young people don’t go down the paths already mapped out, that they are not just condemned to obey social customs, that they can create something new, propose a different direction as regards the true life.” (Badiou, 2017 [2016]: 8)

How is this relevant to design and the education process? If, as in the previous Section, understanding the present was proposed as a prerequisite for future activity, another approach may be much more interesting in terms of our existence (and this research): an approach where one can envision a future in which coexistence is possible as well as envision the person one wants to become. Only after charting this course, can one start looking for ways to modify the world in such a way that this can be achieved. Design theorist and philosopher Tony Fry shares a similar line of thought. In his book *Becoming Human by Design*, Fry introduces a new way of understanding the objective of design. He writes: “We have always been partly formed by the way we form our world, what we have never done is to make such action a conscious, directed and deliberate transformation of the self.”

In this context, *corruption of youth* by means of education will become increasingly necessary. This will be the only way for young people to be able to interpret the world beyond the existent and the particular. This will be a way for them to play an active role in changing the world instead of merely uncritically maintaining existing (unsustainable) practice. All of the above raises the question, what active role can design knowledge play in the education process, in the process of the *corruption of youth?*

03

CASE STUDIES

To answer the last questions in Section Two, a selection of case studies highlighting relevant findings is presented in Section Three. These are then discussed further in Section Four, Research Results and Section Five, Look Ahead.

3.1:

Institutionalised learning

The first set of case study examples focuses on institutionalised learning programmes whose teaching methods intentionally involve design thinking tools in order to improve students' results and their acquired knowledge. Very importantly, these are not design schools per se.

3.1.A: Kindergarten

Trnovo Kindergarten
Location: Ljubljana, Slovenia
www.vrtectrnovo.si

Vrtec Trnovo (Trnovo Kindergarten) is a nursery school that is part of wide network of pre-school childcare institutions publicly funded in Slovenia. It has, however, one strong characteristic which distinguishes it from the rest. Over the years, management and staff have developed a special method of learning, researching and developing creativity through the involvement of puppetry. Educators of Trnovo Kindergarten calls this method "Pedagogical Puppeteer" (Antič et al., 2015).

Relevant findings

- Methods and tools are exactly defined and were developed through iterations over many years.
- In the learning process, a pedagogical puppeteer uses a pedagogical puppet in a systematic and meaningful way.
- Through pedagogical play, the educator and child gain knowledge based on a research question by: 1. experience, 2. observation, 3. gathering information, 4. communication and 5. experimenting in open and laboratory learning environments.
- Experiences to solve difficult problems with the help of a puppet in a safe environment gives children assurance and stays in the long-term memory as a positive experience for the future.
- Deep emotional engagement with the puppet greatly helps in setting up goals and energy, children are eager to get involved and have steep learning curves not just for facts but are also creative in finding their own methods for solving related problems.
- An innovative form of learning is thus an independent form practiced by children, educators, parents and other experts, who are not scared of change or transformation and have a vision of how to improve the world, their pre-knowledge and enrich formal education.

3.1.B: Primary school

Budapest schools
Location: Budapest, Hungary
www.budapestschool.org

Budapest School was launched in September 2015 and is a network of local and community driven schools with education for around 2000 young adults. The main aim of the school is to create an educational environment in which children become naturally equipped with the mindset and skills needed to lead a happy life.

Relevant findings

- The idea behind the school is to design a school system where collaboration, growth-mindset and cooperation are in the frontier of the education curriculum.
- In order to achieve future-adaptiveness in a competitive environment, they foster critical thinking, creativity and a curious mind.
- They practice learning as a system which is being constantly improved by educators and tech professionals.
- Main characteristics:
  - mixed age classrooms
  - personalized education and focus on the whole child
  - subjects are taught around themes
  - learning environments are managed by teams of teachers
  - school builds emotionally safe environment and is radically inclusive

Urban Montessori Charter School
Location: Oakland, USA
www.urbanmontessori.org

Urban Montessori is a TK-8[1] charter free public school located in Oakland. The school is based on the teachings of Maria Montessori, in combination with design thinking, and arts integration.

Relevant findings

- Classrooms are:
  - mixed age
  - self-directed — children select activities from a prepared environment
  - organized around uninterrupted blocks of work time
  - places where children learn through discovery
- The school defines design thinking as the ability to use a systematic process to understand people and situations, define problems, and come up with innovative solutions.
- "Design Challenges" are integrated learning projects in which students go through the steps of the design thinking process. These can be short, designed to introduce all phases of the process quickly, or long, to allow for in-depth investigation into the curriculum components.
- Students are also engaged in hands-on projects that focus on building empathy, promoting a bias toward action, encouraging ideation and fostering active problem solving. Using one's imagination is central in this process as is building competency in learning-to-learn skills such as working in groups, following a process, defining problems and creating solutions.
- In short: teachers utilize design thinking principles and processes in order to enable students to build creative confidence and enact positive change in the world.

1 K–8 schools, elementary-middle schools, or K–8 centers are schools in the United States that enroll students from kindergarten/pre-K (age 5–6) through 8th grade (up to age 14), combining the typical elementary school (K–6) and junior high or middle school (7–8). https://en.wikipedia.org/wiki/K–8_school (March 20, 2017).

3.1.C: University

Department of Science Education, Faculty of Science, University of Copenhagen
Location: Copenhagen, Denmark
https://innovationenglish.sites.ku.dk

Rikke Kortsen Okholm from Department of Science Education is editor of an innovation toolbox for (university-) teachers. The toolbox was developed by Katapult - entrepreneurial greenhouse and Teach First Denmark, both based at the University of Copenhagen in collaboration with WorkZ (concept development), Stickelback (web development) and Marie Flensborg, UCPH HUM (graphics). In addition, the development happened in collaboration with teachers based at Copenhagen Business School (CBS), the Technical University of Denmark (DTU) and the University of Copenhagen (UCPH). (Innovation and entrepreneurship in education)

Relevant findings

- Toolbox – created for teachers – covers various design-related models and approaches: design thinking, business model canvas, double diamond... It deliberately gives tools to cover all the areas of a typical design project: team dynamic, field work, problem definition, idea generation, idea selection, concept development, testing, prototyping and realization, but are to be implemented and use in all the courses at the University of Copenhagen.
- Most models and methods in the toolbox have been tested within the context of previous and current efforts to integrate innovation and entrepreneurship into courses at the University of Copenhagen.
- The aim of the innovation toolbox is to provide (university-) teachers with a clear means of planning and implementing courses that incorporate innovative elements.

3.2:

Informal forms of learning

The second set of case study examples focuses on informal and unconventional (open source) forms of learning, those that deliberately challenge the present state. Additionally, the focus is on projects and individuals who lack formal training as designers yet practice design professionally or use professional design tools in their jobs in a professional way. The term “professional design tools” primarily denotes the ability to understand complex situations (the ability to recognize and solve complex problems) with the explicit purpose of changing existing situations into preferred ones.

3.2.A: Open Source School

La Scuola Open Source
Location: Bari, Italy
http://lascuolaopensource.xyz/en

Educational Institute, Centre for Research and Consultancy – in Art and Technology – for Industry, Trade and Handicraft (digital or not). They believe and practice open source because, in its incremental logic, it represents the blueprint for a collaborative, adaptive and recursive cultural system. They believe that such an approach needs to be used in all fields of knowledge, so to enable possibilities for everyone.

Relevant findings

- What do they believe in?
  - Non-linearity
  - Co-design
  - Open work
  - Multiverse
  - Antifragility
  - Do it yourself
  - Opensource
  - Hacker ethics
  - Sharing
  - Osmosis
- How do they *contradict* formal education? By:
  - non-linear learning paths
  - learning by doing
  - new professions and skills
  - a sharing space to grow up
- Their value proposition is:
  - Access to a future, a better one: consult with others, cooperate, work on projects with a tangible impact on the real world
  - Curiosity being the engine of progress
  - Promoting a transversal and peer-to-peer approach to the learning topic
  - Spaces for social aggregation to learn in a cooperative context: the necessity to restore sharing spaces and practices
  - New professional figures: things change, therefore we need to change things

3.2.B: Science

Visual Strategies. A Practical Guide to Graphics for Scientists and Engineers
Felice C. Frankel and Angela H. DePace
Yale University Press, 2012
http://yalebooks.com/book/9780300176445/visual-strategies

A research scientist at MIT’s Center for Materials Science and Engineering, Felice Frankel, and systems biologist Angela DePace (with others experts from the fields) wrote a very practical and enlightening book about the importance of science communication. The book is based on the notion that scientists are not trained in design and visual language and their concepts and outcomes of research are often poorly presented. The book is a tool to educate scientists and engineers in how to visually present their findings in clearer and more comprehensible ways.

Relevant findings

- The aim of the book is to help scientists and engineers improve the way they portray their research through visual communication design (photos, diagrams and graphs). Different media (journal submissions, grant proposals, conference posters and presentations) urges them to apply different methods in which they are not skilled and this book gives them a rich base from which to learn about successful visual language.

- Although tools and technics on how to visualise are very important, the publication’s vital contribution is also clear communication about the design process: how to define a problem (what do you want to communicate), and what tools can be used at what point (organisation of elements, abstraction and simplifying of material, use of colour, use of space, the importance of editing and iterations...).

3.2.C: Self-educated designers

Design professionals are not always educated at design and architectural schools or academies. Some of the most prominent figures in the design field can serve as good examples of self-taught designers. Here we present few examples from diverse fields and backgrounds:

Giulio Gianturco
www.giuliogianturco.com
Gianturco represents an example of a doctor/surgeon turned designer. He graduated in medicine and surgery but gained his knowledge of materials and problem solving know-how from his hobbies, such as sailing. He applied design skills first to his own private environment, but soon developed production runs for the products and left medicine to establish his design studio.

David Goodsell and Sabina Radeva
http://mgl.scripps.edu/people/goodsell
www.sabinaradeva.com
Natural scientists often became interested in visualisation and in visual explanations of the material they are researching. Two of them are successful illustrators: David Goodsell – as a practicing molecular biologist turned artist-illustrator he merges his interests in cells, pathogens, molecules and art. A second example is molecular biologist Sabina Radeva, who also became an illustrator without formal education and recently published a picture book based on Darwin’s *On The Origin Of Species* in order to communicate his breakthrough ideas in understandable and accessible way.

Don Norman
www.jnd.org
A university professor, co-founder and consultant with the Nielsen Norman Group. He graduated in Electrical Engineering and Computer Science (EECS) from MIT and was awarded a Doctorate of Philosophy in Mathematical Psychology from the University of Pennsylvania. He is best known for his books on design, especially *The Design of Everyday Things*. He is widely regarded for his expertise in the fields of design, usability engineering, and cognitive science and his advocating of user-centered design.

Johannes Torpe
http://johannestorpestudios.com
A self-educated designer, the former Creative Director of Bang & Olufsen, and now founder and creative director of Johannes Torpe Studios. He was raised by parents on a hippy commune in Denmark and taught to think freely and in unorthodox ways. In his studio they work across a multitude of creative industries with interdisciplinarity at the heart of the studio, they are advocates for an unrestrained and fearless approach to design. “From a musician, lighting designer and club owner to furniture designer, restaurant owner and interior designer, Johannes Torpe has proven that formal training isn’t a necessary prerequisite to success in the design industry.” (Tucker, 2016)

Elizabeth (Dori) Tunstall
http://dori3.typepad.com/my_weblog/
Tunstall holds a PhD and an MA in Anthropology from Stanford University [1994–1999] and a BA in Anthropology from Bryn Mawr College [1990–1994]. She is Dean of the Faculty of Design at Ontario College of Art and Design (OCAD) in Toronto, Canada and the first black Dean of a Faculty of Design anywhere. She is interested in human values and design as a manifestation of those values. She works as a design anthropologist, researcher, academic leader, writer, and educator. Tunstall has described the teaching of design anthropology as a hybrid praxis of: critical anthropological and design theory; anthropological and participatory design research methods; design studio and social systems making. She also suggests a shift in design education to focus on how students and staff exist ontologically, or ‘be,’ in the world rather than solely how they see the world. (Tunstall, 2011 and 2012)

3.3:

Learning “after the end of the world”

The third set of good practice examples focuses on projects and considerations that extend to learning “after the end of the world”, at the time when the scenarios under Section Two (context) may start to become a reality. Possible learning trajectories were examined, with an analysis as to which aspects are already closely associated with design (and in what way).

3.3.A: Intentional learners

Supporting students to self-direct intentional learning projects
Terje Väljataga and Sebastian Fiedler
www.academia.edu/2875068/Supporting_students_to_self-direct_intentional_learning_projects_with_social_media

Already in 2009, Väljataga and Fiedler published an article advocating “self-directing intentional learning projects”, which would be helpful in coping with “many authentic challenges in increasingly networked and technologically mediated life”.

Similarly, the Association of American Colleges and Universities (AAC&U) is working on identifying the hallmarks of the 21st Century graduate: “new emphasis will be placed on educating students to be purposeful and self-directed in multiple ways—on becoming intentional learners”. The report *Greater Expectations: A New Vision for Learning as a Nation Goes to College* (2002), states:
“Becoming such an intentional learner means developing self-awareness about the reason for study, the learning process itself, and how education is used. Intentional learners are integrative thinkers who can see connections in seemingly disparate information and draw on a wide range of knowledge to make decisions. They adapt the skills learned in one situation to new problems encountered in another—in a classroom, the workplace, their communities, and their personal lives. As a result, intentional learners succeed even when instability is the only constant.” (Clayton-Pedersen and O’Neill)

Relevant findings

- A vital combination of empowerment through intellectual and practical skills, which is informed by knowledge and ways of knowing; and responsible for personal actions and civic values.
- Mastery of a range of abilities and capacities empowers intentional learners as they manoeuvre in and shape a world in flux.
- Intentional learners possess a core of knowledge, both broad and deep, derived from many fields. Through discussion, critical analysis, and introspection, intentional learners come to understand their roles in society and accept active participation.
- In short: students are expected to draw on various knowledge bases, integrate them, conduct increasingly more sophisticated analyses as they progress through college, and use their integrated knowledge to solve complex problems. (Clayton-Pedersen and O’Neill)

3.3.B: The Studio at the Edge of the World

Location: Tasmania, the Island State of Australia
www.thestudioattheedgeoftheworld.com

The Studio has an interdisciplinary and international focus. It is a new kind of venture and centres on two areas of activity: the creation of learning events; and the development of a design think-tank in partnership with education institutions, government, NGOs and associates.

The name of the Studio is based on the recognition that we, human beings, all now live on the edge of a disaster wherein environment, social, geopolitical and economic unsustainability will fuse. Thus humanity is in danger of going over this edge. Behind the Studio is Tony Fry, an internationally recognised design theorist, educator, and author. Fry, by working with other distinguished authors, pushes the envelope by addressing emerging areas.

Relevant findings

- The studio is to grow a cadre of interdisciplinary ‘designers’ able to globally proliferate transformative inspirational ‘trigger’ projects that, over time, will advance cultures, economies and politics of ‘The Sustainment’.
- The studio practices learning that is by its very nature interdisciplinary and necessarily intercultural.
- The studio attracts those architects, designers and other professionals who are unsettled by ‘the state of the world’ as seen in its environmental, geopolitical, socio-cultural and inequity problems. Such people are frustrated by the limits of their practice, and recognise the insufficiency of the ways that ‘sustainability’ – as theory and practice - is currently applied to the unsustainable human condition and to world making, and who want an intense and grounded learning experience that will advance their knowledge, practice and transformative capability. (The Studio at the Edge of the World)

04

RESEARCH RESULTS

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In Section Four, we discuss our findings, conclusions and posed questions about the state of new education models. After a brief introductory overview, we follow Fry’s suggestions and search for new education models that would help reshape the world in a way that enables humanity to consciously and deliberately transform the self. We conclude with a challenging notion – the need to reflect on how design might enter all educational programs.

4.1:

The state of research

Here we present an overview of the main concerns regarding new *design* educational models and the opportunities that lie ahead.

01.

The research shows that in some places doubt is rising about the established (political, economic and social) criteria for the necessity of a constantly changing and adapting of education. It seems more important to seek the answer to the question: What are the basic types of knowledge that an individual should acquire (or at least know), regardless of the time in which one is becoming educated? In the context of the current study, the key question is thus: What are the basic aspects of design knowledge that one* must acquire during the education process?

** Here we are thinking about each one of us, since we are following the aforementioned definitions recognizing all of us as designers*

02.

The demand for the separation between knowledge that ensures the possibility of direct application (often this knowledge is characterised by the term “useful knowledge”), and that which does not reveal a direct application, is today substantially interfering in the field of education. But, as we’ve tried to stress: Is not the formation of a curriculum with merely “useful knowledge” rather insufficient? Would we not instead be more successful in gaining *applicable* knowledge through working in practice**? Or does *useful, applicable knowledge* actually apply to exercising skills?

The latter leads us to the next question. If applicable knowledge is regularly acquired through practice, does that not mean that classical education should be dedicated to the transfer of knowledge from general knowledge to an understanding of the complexity of situations (an ability to recognise problems), to empathy? Thus to the knowledge that is already necessary for professional designers today as well as for all people who are changing an existing situation into a preferred one?

*** With a supplementary question, how long can we still debate human labour? See more under point 3.*

03.

The third question, which is becoming increasingly relevant for the field of education: What will happen with education in the event of the end of human labour? Will the focus on education be even greater? Or will the possession of knowledge become entirely pointless? Will we search with even greater intensity for new knowledge that will help us reach even further, since we will finally no longer waste time working just to survive? Or will we simply lose the desire to learn, since robots will do all the thinking for us?

The continuing degradation of the environment – another completely possible scenario –, would also dramatically affect our focus on education. It seems that certain skills would greatly benefit us in such a situation, skills such as: how to find drinking water, how to raise food, how to take care of one’s safety... With a shift of focus, the question arises: in such a case what would happen to all of philosophy, art, culture, all the learning from general knowledge we have piled up through millennia?

It is interesting that mastering the basics of design remains relevant in both of the described potential futures – for confronting all the types of recognisable, more or less complex problems. We can once again confirm the fact that design has always been an important part of what makes us human.

04.

The common denominator of all three concerns is the problem of the existing condition, or rather, the fact that design is separated from other professions, from other knowledge. It seems all the more logical to abolish design as an independent, separate education discipline and introduce it into all the pores of education as a mandatory component. The fact that everything is designed and simultaneously only a small part *of everything* has been designed by trained designers, clearly demonstrates that the existing system is not working. Actually, it is becoming clearer that it would be more reasonable to empower everyone who daily changes an existing situation into a preferred one with a knowledge of design. In a similar way, just as the majority of us learn to read today, that same majority can learn the basics of design (that is – to simplify – an ability to recognise a problem and find an empathetic, functional solution to it). Only in this way will we finally begin to pay attention to our skills, knowledge and also to the effects we cause with our doings. Comprehending this might give us (human designers) the opportunity to be (in the future) part of the solution and not the problem.

05.

The one question that remains is: Where is the place for professional designers in the future? Here we are following the notion of Italian designer and theorist Andrea Branzi. Branzi perceives design no longer “as a positive response to a functional requirement, but as creation of the demand itself, i.e. as active intervention in the modification of behaviour, creating new functions and new freedoms. As early as 1954 Ettore Sottsass Jr. wrote: ‘When Charles Eames designed his chair, he was not designing a chair, but a way of sitting; that is to say he was not designing for a function, but designing a function.’” (Branzi 1984, 49)

According to Branzi, design no longer responds by proposing a solution to an identified problem, but rather – as the quote above implies – by creating the demand itself. This means that instead of a solution to a problem, one designs a problem itself. In the light of this, one may understand what Branzi means by referring to the necessity of creating the demand itself. It is about redesigning the identified problem, where the result of the redesign creates conditions for new functions.

By enabling new functions, one paves the way – in the words of Branzi – for new freedoms and the capacity for active intervention in the modification of our behaviour. To achieve this, design needs thinking individuals. It needs all those whose everyday actions are overlooked, but freed of the domination of the market. So, the role of design is both to recognize these individuals and empower each and every one of us. Even more, the role of design (as one of the key elements that shape the environment we live in) is therefore not only to transform our environment in such a way that it enables the described empowering of individuals; but also, design is in a position to create the right conditions for devising and encouraging new functions. As the essence of emancipatory learning, the latter constitutes a solution to the challenge described under point 4 of this Section.

05

LOOK AHEAD

31 If we concur that it would be reasonable to empower everyone who changes an existing situation into a preferred one with a knowledge of design on a daily basis; and if we concur that there would still be a place for professional designers in a world where everyone had a basic knowledge of design, the question arises: What now? If we establish that the role of designers today is to create the conditions that make possible what has been proposed, perhaps the first step is to specify the type of designers that we should start discussing. The answer to this question begins and concludes Section Five of this research.

5.1:

Design as critical consciousness

In 1969, renowned American visionary, inventor, designer, architect, lecturer and prolific writer Richard Buckminster Fuller published his *Operating Manual for Spaceship Earth*. As the title suggests, this is a manual. A manual for life: not in terms of today's self-help newspeak, but in terms of reflection about the ways of teaching and acting that pursue the principles of sustainable coexistence of all who share life on Spaceship Earth at any given time.

It is an irrefutable fact that if only a few of the guidelines from the manual had been adhered to when it was first published, today's world would be a different place to live in. I dare say it would be a better place to live in. A world without hunger, a world with underlying "more with less" logic, a world that would have realized long ago the short-sightedness and exhaustibility of the use of fossil fuels and nuclear energy. This would be a world where wealth and peoples' attitudes towards knowledge and learning were fundamentally re-defined. It would be a world where decision-making were not in the hands of a handful of individuals. What is more, fair distribution of resources and means would have become self-evident rather than still being a matter of mere initiatives proposed by individuals such as the aforementioned British astrophysicist, mathematician and cosmologist Stephen Hawking.

Nearly fifty years since the publication of the book, our attitude towards technology is probably where we most relate to Fuller's thinking, but only in that despite the climate change we are causing with our own insatiability, we still firmly believe technology is what will ultimately save us. Thanks to our firm faith in technology, we still belive we can safely avoid addressing the urgency of changing individuals' behaviour. Philosopher Peter Klepec refers to this as the inability to imagine what is "real", for "the Real always comes as a surprise, as a traumatic incursion. Today, we find it easier to imagine building rings around the planet to fight pollution than contemplating real social change." (Klepec, 2015)

In other words, according to Klepec, if life threatening pollution forced us to choose between proposal (1) – building a ring around the planet – and proposal (2) – making changes to our behaviour in order to stop pollution – we would find the first proposal more acceptable. Despite the technological complexity of building rings, such a process is more easily conceivable than a world in which – as Fuller proposes – the accumulated knowledge would be invested, rather than in the development of ever new weapons and warfare, in a better life for everyone. This and all Fuller's previously listed proposals seem in their very essence to be impracticably fictitious. As something that is simply not real. This is why, even if the decision for a better life for everybody may appear to be self-evident, this seems an impossible choice each and every time that society is faced with it. Regardless of how enforced we may find the alternative, this option still seems to be utterly unfathomable as it envisages social change. It seems that time and again, we lack what it takes to make a conscious, critical and responsible choice and decision, and accept its long-term implications.

Needless to say, such choices and decisions are not easy to make. Yet it is the accumulated knowledge and the range of available thinking tools that no longer allow one to evade thinking and using these tools to change our behaviour. In his *Letters Upon the Aesthetic Education of Man*, Friedrich Schiller wrote: "Man is not better treated by nature in his first start than her other works are; so long as he is unable to act for himself as an independent intelligence, she acts for him. But the very fact that constitutes him a man is that he does not remain stationary, where nature has placed him, that he can pass with his reason, retracing the steps nature had made him anticipate, that he can convert the work of necessity into one of free solution, and elevate physical necessity into a moral law." (1794)

Nearly two centuries later, Paulo Freire followed a similar line of thought. In his *Education as the Practice of Freedom*, he wrote: "Human relationships with the world are plural in nature. Whether facing widely different challenges of the environment or the same challenge, men are not limited to a single reaction pattern. They organize themselves, choose the best response, test themselves, act, and change in the very act of responding. They do all this consciously, as one uses a tool to deal with a problem. Men relate to their world in a critical way." (2011, 3)

What matters is reason, the ability to make independent and conscious decisions, choices. Acting this way means being active, critical. Or, in the words of Freire, developing a critical consciousness. One is capable of rising to the situations and challenges they are faced with, and changing them, through their action. One is capable of intervening with the context that first seems unalterable. And this is essential in understanding conscious critical behaviour, for, as Freire explains: "The integrated person is person as *Subject*. In contrast, the adaptive person is person as *object*, adaptation representing at most a weak form of self-defense. If man is incapable of changing reality, he adjusts himself instead." (Ibid., 4)

The latter – uncritical adjustment – is far too often also seen in the field of design. Each time it manifests itself, the designer becomes a negation of what he or she should be. This is a negation of the premise of an all-round individual capable of anticipatory thinking, of an individual who can see the big picture, of a thinking individual. By acceding to uncritical adjustment, individuals are objectivised, along with their thoughts, actions, roles, and, as a result, the position of design in society.

The role of the disempowered assumed by today's designers and their uncritical stance on the present situation are reminiscent of the state of tutelage as defined by the philosopher Immanuel Kant. This is a state self-incurred by an individual due to his "inability to make use of his understanding without direction from another". Kant offers a seemingly simple piece of advice on how to emerge from this state: "Have courage to use your own reason!" (1784) As the first step towards using one's own reason to find a way out of the state of tutelage, philosopher Ivan Urbančič emphasizes the necessity of acknowledging one's true state, the necessity of finally realizing the truth about oneself. It is only after one realizes that no man is free that one can start asking questions such as: What now? What chances have we got? (2009) Or in the words of philosopher Rado Riha: "Freedom starts by asking ourselves: What do we really want?" (2009)

This research confronts us with the necessity of the critical education of designers. Here, it should be noted that "designers" refers to trained professionals as well as those without formal training. Rather than a reason to succumb to the role of a compliant *Object*, this interdependence is precisely the reason why a critical stance should be an indispensable premise of all our actions. By fighting the nihilistic notion that all is already lost (and by providing a wake-up call from the pleasant dream that technology can provide a last-minute rescue), this research should be used for re-establishing the working ground. It is only by developing a critical consciousness that designers can once again become integral persons and finally assume the role of *Subject* in today's society. What is more, by educating ourselves, we will grasp that we possess the power and means – namely intercultural and interdisciplinary action – to undertake real social change.

06

APPENDIX

6.1:

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6.2:

Research team

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6.3:

About CODEC

CODEC, the Co-Design Collaborative is a design driven interdisciplinary network of highly skilled and experienced individuals, companies, associations and research institutes in Europe. We co-innovate with our users by combining rigorous research, vast practical experience and in-depth know-how. We are driven by a common social purpose: to not only do things right, but do the right things.

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