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E-LEARNING AND DESIGN PRACTICE. Tools and methods for professional learning of strategic design approach

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Abstract: The aim of this paper is to present a new methodology in teaching the strategic design approach combining e-learning with practice activities in a unique process of learning experience.

Design is moving its domain area close to the management of the innovation and the company strategy. In this new framework strategic design is a mind-set that drives to answer to the social, economic, environmental challenges. Designers can improve their capacity do adopt this mind-set to be able to operate in this complex context also using specific tools and design methods to understand the user experience and to co-design new solutions. These methods are various and can be taught and learned through various education experiences; a wide range of topics in a constantly changing world render designers as lifelong learners.

This new professional framework need a continue learning process that designers need to follow to empower skills, competences, knowledge and abilities. Trough a research activity with a pilot experience, a new teaching methodology has been tested in international high training courses and partially in a training program included in a European project.

Keywords: Strategic Design, learning experience, e-learning, practice based approach, professional learning

1. Learning experience and design

“Learning is experience. Everything else is just information”

A. Einstein

Experiential learning theory proceeds from the assumption that learning is best conceived as process, not in terms of outcomes. Ideas are not fixed and immutable elements of thought but are formed and re-formed through experience. Learning is than a process where concepts are derived from and continuously modified by experience (Kolb, 1984).

Learning is a process where new knowledge, skills and attitudes are achieved through an immersive and concrete learning experience. Such a learning experience works in a boundary:

- Observation and reflection: specific situations and the ability to involve themselves fully, openly and without barriers into real a situation support the capacity to observe and reflect on a concrete experience but with the ability to define general concept adaptable to general framework;
- Theory and practice: transform theoretical framework into answers to problems and to take decisions.

What the experiential learning theory offers is fully close to what professionals in the fields of design and in all the sub-fields in which the discipline is working (strategic design, service design, fashion design, communication design etc.) need. Theory and practice is always a boundary in which design works. Improve skills, knowledge and abilities to manage the complexity of innovation processes design driven is a challenge for any training program addressed to professionals in the design sector.

1.1 Strategic design approach: between learning and practice

Design is becoming a pervasive aspect in different fields and it is also increasing its importance in training programs. A huge range of subfields, such as industrial design, product service system design, communication and interaction design, service design, and strategic design are becoming crucial for the innovation process of companies in different economic fields. Training in design is also changing according to the evolution of design practice. And what are influencing the transformation of design practice? Certainly an increasing attention to approach close to the idea of co-create, co-design end open innovation. The inclusion of users, customers and communities into the whole design process (from inspiration to iteration and prototyping) is moving the traditional user-centred design approach the human-centred design logic (Ideo, 2011).

According to [Sanders & Stappers 2008] we are moving from the design of categories of products to designing for people's purposes. The traditional design disciplines are centred on the product or a technology. Today designers gains the skills needed to expertly conceive of and give shape to products such as brand strategies, landscape, new form of living and work spaces, consumer products and technological devices, services, territorial promotion strategy etc. The emerging design practices centre around people's needs or societal needs, and require a different approach in that they need to take longer views and address larger scopes of inquiry.

The domain of design discipline is moving than from the product innovation to a type of innovation emerged from the translation of users and societal needs into a complex system where the product is only a small part of this complexity. According to [Manzini, 2002] this type of innovation has to be seen as a strategic process, which has resulted in new forms of organization and innovative forms of co-production of value. In other terms, the uniqueness of the innovation does not lie in the area of technology (process or product), but in the way existing technologies can be used. The product service system is than a subject of this so called strategic design approach with this perspective of new type of innovation (design driven innovation). In fact strategic design is a design activity aiming at an integrated system of products, services and communication, based on new forms of organization, based on the roles reconfiguration of different companies, clients and other stakeholders; a design developing a strategy linking long term goals with existing trends and based on new systems of values and new market opportunities.

Design is than moving its domain area close to the management of the innovation and the company strategy. Strategic design is than a mind-set that drives to answer to the social, economic,

environmental challenges. Designers can improve their capacity do adopt this mind-set to be able to operate in this complex context also using specific tools and design methods to understand the user experience and to co-design new solutions. This new professional framework need a continue learning process that designers (but not only) need to follow to empower skills, competences, knowledge and abilities.

1.2 Needs of designers and continue learning

Design discipline, as nature, requires continuous creativity to be addressed at a wide range of issues and problems to be considered. As being a vibrant practice, design is close to adopt a way of thinking, which embraces the addressing users, not only in terms of observing or researching, but also being able to “put yourself into the shoes of that person” (Brown, 2009). The notion of understanding the user experience and creating innovative scenarios to enhance its quality is a broad task which necessitate not only the production of as many ideas possible, but also to analyse them, detect the ones that have potential and implement them in real life. Throughout this synthesis and refinement of ideas into clarity, there is a set of methods that guide the designers through the pathway (Kolko, 2015). These methods are various and can be taught and learned through various education experiences; a wide range of topics in a constantly changing world render designers as lifelong learners.

In pursuance of arriving at the education solutions through the involvement of strategic design, it is essential to understand the needs and skills of designers. In order to be well equipped to seek for solutions into modern world problems, skills of designers are more operative when combined with other abilities such as economic, organizational and social (Murray, J Caulier-Grice, Mulgan, 2010). While designing in a social context, role of the designer is to look at the system in a broader frame seeking for the problem and clarifying the solution.

The role of a creative mind is not limited to the theoretical realm. Considering the implementation of a design solution, a designer goes through several phases, which not only require social but also technical skills and knowledge. Examples to these can be Rapid Prototyping and Visualization tools, which are more technical and concrete (Mulgan, 2014). Since a good idea would not be meaningful without a meaningful execution, designers also need to be aware of and well equipped about these technical aspects (Brown, 2009).

In short, designers are in constant need of knowledge covering numerous disciplines and keep their mind open to the production of ideas in a vibrant manner. Considering these needs, it is possible to interpret the significant need for innovative education platforms. As an essential prerequisite of implementing and testing the innovative technologies for education, it is crucial to understand the needs and skills of designers. With this awareness, it is more beneficial to move to the further step.

1.3 Learning experience close to real-world-contexts

The learning experience, especially in design field, need to be situated in real-world-contexts (Kelly, 2013, Rogoff 1984) and it means that the problems and the questions we ask to learners are relevant for a significant context where they can identify project opportunities and the good environment for a design process (Duffy & Jonassen, 1992).

If the design process is connected to a real situation, to a particular case study and developed in real time, to a specific brief, even in an environment designed for a training experience, the spaces for reflection, knowledge sharing, and the stimulation of creativity will be several.

A learning experience in the design as well as being applied to real contexts must include team-working activities. Design involves human beings using knowledge to create what should be, things that not already exist. Design is the activity of changing existing situations into desires one; than it should be the core competence of all professional activities (Simon, 1996). But for professionals in design the medium for intervention into the reality is a discourse (Argyris et al. 1985). The design process than involve in a dialogue and discourse various disciplines and actors with the logic of team working and co-creation of knowledge.

The process of knowledge construction and the development of reflexive awareness of that process support the empowerment of different soft skills that are crucial in an educational program addressed to designers: the possibility to understand and adopt an alternative sign system, the empowerment of imaginative skills (the use of metaphors and abstractions), the development of self-conscious manipulation in the design and knowledge sharing process (Bednar et al, 1992). Since every learner has a unique perspective, story and way to see and foreseen, in a learning program addressed to the knowledge construction, development and sharing of strategic design the process and the experience of learning should be adaptive and responsive to the learner.

1.4 *Maieutiké or ipse dixit?*

In recent years we increasingly hear the word "maieutiké" when we talk about training; a word that today should be open a discussion. Plato in the "Teeteto", attributed to Socrates, Greek philosopher of 400 BC, the maieutiké method, or the practice of the midwife, who gives birth in the disciple's opinion, the daughter of a critical research approach urged by short, continuous and timely questions from the teacher. This approach was (and still is) converse of classical "ex cathedra" training method, where an influential source, administering "his" knowledge in a unidirectional mode.

The objectives of the two training methods are different:

- in the first the former tends to form a critical and nonconformist spirit ;
- the second provides pre-encoded content or methodologies to reiterate a particular vision.

Two paths, thought parallel, in the process of knowledge that interact and "converge" (as in the famous oxymoron of Aldo Moro on "parallel convergences"), in creating the cultural background of a person based on knowledge of other people's experiences and the deep traces of the own experiences. The maieutiké does not arise as an alternative to the knowledge transfer itself, but the indoctrination that already contains clear-cut ready-mixed results of the training process.

Another thing is to transfer proven methodologies and create the simultaneously desire, the passion, creativity, invention and experimentation. In the field of design, continue asking questions, especially about the reason why and the design choices, is the best professional practice that drive to innovation addressed to social behaviours.

If it is easy to think of maieutiké thinking to Socrate and his disciple to walk to Athens in a close physical relationship, it is less easy to think applied in a e-learning platform where the virtual space transform time and space in variables that create a distance between the teacher and the student. Four solutions can mitigate this critical element. The first is the use of "live conversations" where the dynamic of continuous maieutiké questions to the disciple is replicable with the advantage of solving the distance limits. Surely a video call does not compete with a walk to Athens between teacher and disciple, but certainly allows teacher to bring out the "genius loci" of the student and take him with questions and suggestions at greater self-knowledge, capacities and real interests.

In teaching experiences of the authors this activity, defined in some cases coaching, is a fundamental element of a less technical and more relational training approach: theory and practice balanced to have a experiential learning with the student at the centre (with desires, beliefs, strengths and weaknesses).

The second is to launch on the e-learning platform a design path constantly stress with questions and "alerts" that encourage the student to answer, first of all to himself, on the senses of his decisions in order to better define contexts and horizons.

The third is "gamification" an exercise that stimulates and verify the degree of critical skills of the student, by engaging in the allocation of "awards", a contest where he/she has to discover, analyse, evaluate, visualize, and deliver various items and particular values, the components of a particular product, service, system, from one object to an event, and "reward or condemn them" with a vote and a brief comment. This playful approach creates attitude in critical observation of the situations in which students are involved and to give them a perceived and reasoned position.

The fourth solution is related to the brainstorming method, space and time for free creativity and the "trial of intentions" in which the teacher produces the doubt as an element to be overcome by the student with new solutions in the creative phase, then project and then again communicative solutions.

All of these methods make the e-learning experience more articulate, interesting and effective for both physical and virtual relationship and from the point of view of experience for the modern disciple (designer) that is urged to provide solutions and not just to assimilate, a contemporary maieutiké approach.

2. E-learning and practice activities in a unique learning experience to teach the strategic design approach

2.1 The e-learning scenario

E-learning has been implemented by several fields of education in various forms since a considerably long time. The combination of in-class education with online pre class assignments, for instance, is a commonly adopted form of learning at different levels of education. Known as blended e-learning, this scenario takes online systems as core activity and the traditional in class education as a complementary medium for maintaining a concrete interaction between students and teachers (Li-Tze an Hung, 2015).

E-learning systems have various advantages such as reduced costs and increased flexibility for institutions and enable students to be independent on their choices of learning patterns (Li-Tze and Hung, 2015). A good e-learning implementation would involve the combination of online and offline materials in sufficient levels. As discussed by Graham (2001), a well-designed platform first of all should promote student faculty interaction as well as the collaboration amongst students.

The efficient implementation of e-learning in the framework of courses addressed to life long learning experiences for designers has been achieved in this research experience through two ways. Firstly, by increasing the level of interactivity of online platform through the execution of various trends and effective use of media tools. A powerful example is the gamified learning based on several challenges and feedbacks, keeping the learners motivated through its experiential essence. Another compelling trend is the division of a huge content into smaller portions, which is called

Micro learning (Learning Nuggets). This type of learning materials can come into forms as small videos or visual materials which require no longer than five minutes to watch or have a look at. This type of learning is advantageous for teachers and learners: from a literature review the greatest variability in student attention arises from differences between teachers and not from the teaching format itself (Bradbury, 2016), but within an online platform environment the quality of the content and how the materials are provided represent crucial elements for a satisfying lecture experience.

Second, aside from enriching the online content, embracement of tangible elements such as the workshops, laboratories or lectures that take place in classical learning environment is an effective approach in e-learning: this is only one of the reason why the e-learning experience should include stage of “active experimentation” and “concrete experience” as in the traditional learning cycle (Kolb 1984). This approach can provide a concrete environment and rapid interaction, which is challenging to implement by online side of an e-learning scenario. The traditional classroom operates as a medium of tangible realm of learning and opens up many possibilities if it is designed innovatively.

2.2 Teaching strategic design approach with e-learning and practice experiences

In 2015 a research addressed to improve a new methodology in teaching strategic design at professional levels has been developed combining two different didactic methods: an e-learning experience with a web-based platform and a series of practical activities (workshops) focus on concrete company brief. The methodology has been tested in two different international high training programs and in a training program part of a European project. The courses aimed to train, in terms of content and method, a new generation of designers able to manage complex design processes in the world of products and services in different sectors and fields

The general didactic objective would provide methods and tools to coordinate very different skills moving between concrete constraints, such as technology, and abstract goals such as cultural, cognitive, educational and ethical.

The courses have been structured as learning experience balancing abstract conceptualization and reflective observation with a concrete experience and an active experimentation (Kolb 2005).

According to the six propositions of the Kolb theory we identified the specific focus of a strategic design learning purpose in the three learning experiences in which have been tested:

- Learning is best conceived as a process, not in terms of outcomes. In the courses students pass through a process that combines four different ingredients: theory and practice, e-learning and design workshops. In the e-learning the process adopted the maieutiké approach: through lectures, case studies and list of open questions and a selected list of references (with articles, books, videos, websites etc.) the learner has been stimulated to reflect, answer to the questions, make research and also open new questions using the blog area with new topics for the classroom;
- All learning is relearning. In the courses students have been driven to a continue examination, testing, integration and redefinition of ideas and design concepts. The e-learning assessments and exercises stimulated learner in active experimentation, testing the tools in design exercise. During the workshop those experimentation worked in a real- world-context where active experimentation and concrete experience can amplify the learning experience in a real team working session;
- Learning requires the resolution of conflicts. An important part of the learning experience is the teambuilding. Empowerment and resolution of conflicts in the team-

working are the leverage of the workshops. Furthermore, students learn from the resolution of the conflicts when they share topic of discussion and when the teacher propose open questions with the maieutiké approach;

- Learning is a holistic process of adaptation to the world. In the courses personal motivations of students are at the base of the learning process. A continue process of reflection able to combine personal thinking and behaving with relevant needs and problems recognized in the global society is the core of the practice activities (workshops, assessment and exercises);
- Learning results from synergetic transactions between the person and the environment. In the courses students have been stimulated to observe real situation, analyse case studies, sharing questions and opportunities, practice activities; also leisure activities and events have been suggested as opportunities where find connection with methodology, topics, tools and method proposed in the courses;
- Learning is the process of creating knowledge: including dedicated sessions for the knowledge sharing (presentations, open discussions, webinar etc.) between students and teachers and adopting specific tools to collect feedbacks during and after the learning process (surveys, focus groups and interviews) the courses have been the seed of a ground of knowledge that is going on after the closure of the didactic activities.

The learning experience created in each course has been different and balanced on the four learning style (Kolb, 2005):

- abstract conceptualization: lectures, case studies, a list of selected books and articles, a selection of websites and videos and some guidelines to perform an own research of contents to go in depth to the issue but with a strong relationship with personal interests, motivations and passions;
- active experimentation: among test and exercise students can apply tools and methods to real contexts and personal case studies, job opportunities, professional interests;
- concrete experience: the workshops and some exercise in the curricula of the courses included a direct observation of contexts and users in order to apply the rapid ethnography method that is characteristic of the design discipline and extremely important in the strategic design approach.
- reflective observation: final presentation of projects in a sort of pitching session with companies and experts during the workshop, the reflection with the assessment for each online module and the possibility to open topic of discussion with the classroom in the online blog are the most important ways to reflect on the learning experience and the design process performed.

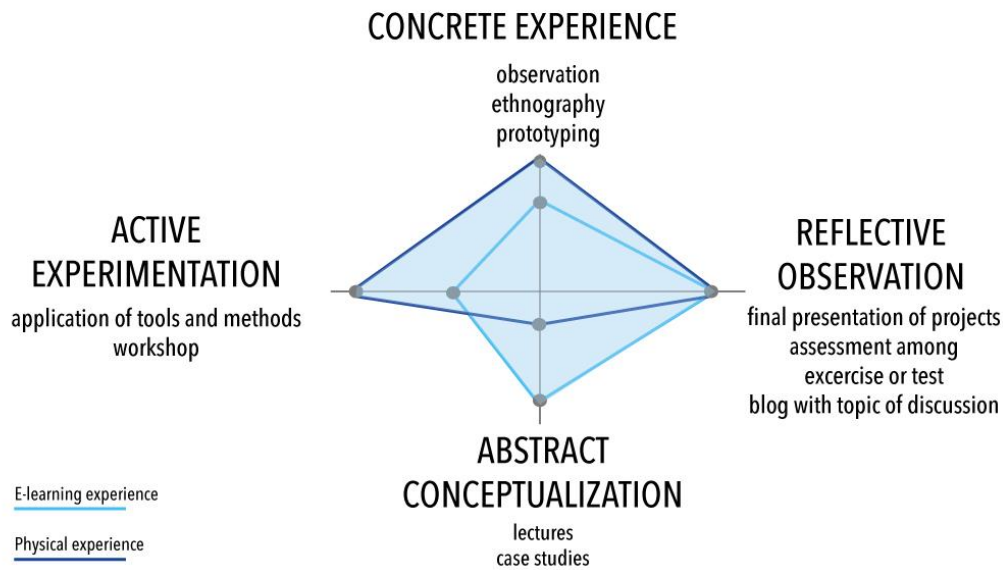


fig. 1 Learning methods and learning experience

The different mix of the learning methods can generate different learning experience for training program in the field of design.

3. A pilot experience

According to the above educational model a pilot experience has been performed with two master programs and a short coaching activity included in a European network of summer academies.

The e-learning experience has been improved with a web-based platform with a customization of the Moodle online open source technology. Among the tool three different training areas have been realized according to the possibilities offered by Moodle.

The students of the master courses (more than 40 students from different nationalities), using the e-learning platform, have attended remotely all the theoretical modules of the basic courses. This allows them to independently manage the time and fruition times of the didactic contents. Starting with the skills and the knowledge improved with the basic e-learning modules students have then been able to develop a project in concrete experiences proposed in workshop sessions (physical experience). Teachers and experts have led the workshops focus on concrete problems and brief proposed by companies in different sectors. In three weeks of intensive team working students pass from the theory of strategic design to the practice of application of tools and method in real company situations.

A coaching activity, included in a network of European Summer Academies, has been instead tested with 80 students from different countries for a consultancy to projects using a web-based tool. In this second pilot experience the process has been opposite: in a real-world context students developed a project with a mix of lectures, workshop activities and exercise. After that they had the possibility to be remotely (with a web platform) supported by experts and professionals in a coaching activity with the aim to develop prototype and feasibility plan of their project.

A learning experience with two different way of teaching (e-learning + physical experience) have demonstrate that the use of technology to enable a design discourse is possible and it can today better support the long life learning of design professionals. They have also demonstrated there is a certain freedom in the design of a learning experience combining remotely and physical experience: different mix of learning methods can be joining to different tools. Different tools can be accordingly designed based to the way of teaching. And the combination of the methods and tools is the core of the design of the learning experience foreseen.

3.1 Evaluation process with surveys, focus group and interviews

A plan of evaluation with surveys, focus groups and interviews has been adopt in order to collect feedbacks from learners and re-design and re-define the educational model and the tools and methods used. In particular a dedicated survey have been used to understand the learning experience trough the web platform, in order to have feedback about strengths and weakness of the web tool. This survey included four different questions:

- the interaction with the platform;
- the accessibility with different devices;
- the learning experience of contents;
- the interaction with the extra-contents proposed: video, articles, websites, case studies etc.;
- the assessment proposed for the modules (exercise or test);
- the use of functionalities like news, sharing materials, topic of discussion, Q&A etc.

For each question the learners answered with four level of evaluation from low to high. The overall evaluation of the learning experience was good both for the interaction and the experience of learning contents, interact with the classroom and access to several contents suggested by the teachers and also with concrete experience among exercises.

The focus group and the interviews held during the workshop activities, after the closure of the e-learning modules of the basic courses, underlined the importance of the maieutiké approach in the design learning experience. Using web functionalities like posting news, making questions as topic of discussion, sharing opportunities and case studies learners can easily open design discourses. Those discourses worked in a boundary between real-context and the web arena of contents and information. Sometimes the learners have started form discussions or opportunities suggested on the web-tool to self-organize concrete classroom experiences (attend a conference together, apply to a Contest in team, etc.). Other times the experience of abstract conceptualization and reflective observation has been developed through a research of contents and insights on the web. The maieutiké approach assume the possibility to offer a compass to learners that they can use to drive a *serendipity* pathway of selection, collection, analysis and evaluation of contents addressed to a design discourse.

References

- Amabile, T. M. (1996). Creativity and innovation in organizations. *Harvard Business School*, 5, 1–15.
- Bradbury, N. A. (2016). Attention span during lectures: 8 seconds, 10 minutes, or more? *Advances in Physiology Education*, 40(4), 509–513. <http://doi.org/10.1152/advan.00109.2016>
- Brown, T. (2009). Tim Brown urges designers to think big. *TED Talk*. Accessed on. Retrieved from http://www.ted.com/talks/tim_brown_urges_designers_to_think_big.html\n<http://www.ted.com>

/talks/lang/en/tim_brown_urges_designers_to_think_big.html\nhttp://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Tim+Brown+urges+designers+to+think+big#0

- Candi, M. (2007). The role of design in the development of technology-based services. *Design Studies*, 28(6), 559–583. <http://doi.org/10.1016/j.destud.2007.04.004>
- Caulier-grice, J., Mulgan, G., & Murray, R. (2010). The open book of social innovations. Social innovator series: ways to design, develop and grow social innovations. *The Young Foundation*, 30(8), 224. <http://doi.org/10.1371/journal.pcbi.0030166>
- Chandler, G., DeTienne, D.R., McKelvie, A., Mumford, T. (2011). Causation and effectuation processes: A validation study. *Journal of Business Venturing*, 26(3): 375-390.
- De Dreu, C. K. W., Bechtoldt, M. N., & Nijstad, B. A. (2007). Team personality diversity, group creativity, and innovativeness in organizational teams. *Sustainable Development*, (1), 1–32.
- Dewey, J. (1938). *Education and experience*. New York: Simon and Schuster.
- Duffy, T. M., & Jonassen, D. H. (1992). Constructivism: New implications for instructional technology. *Constructivism and the Technology of Instruction: A Conversation*, 1–16. Retrieved from https://books.google.com/books?hl=en&lr=&id=yS310A35FCOC&oi=fnd&pg=PA1&dq=duffy+and+jonassen&ots=1w0RrAiBtk&sig=FCJFH9TvyEQxzEY_XbQ0cwue93M\n<https://books.google.com/books?hl=en&lr=&id=yS310A35FCOC&oi=fnd&pg=PA1&dq=duffy+and+jonassen&ots=1w0RrAiBtk&sig=FCJ>
- E-learning Industry's Website, 2016. [Online] (Updated 2015) <https://elearningindustry.com/top-5-tips-innovative-elearning-development>, <https://elearningindustry.com/microlearning-solution-right>
- Forlizzi, J. (2012). The Product Service Ecology: Using a Systems Approach in Design. Proceedings of the 2nd Conference on Relating System Thinking and Design (RSD2). Oslo, Norway, 1–27.
- Graham, C., et al. (2001). Seven principles of effective teaching: A practical lens for evaluating online courses. *The Technology Source* 30.5: 50.
- Herrmann, A., Huber, F., & Braunstein, C. (2000). Market-driven product and service design: Bridging the gap between customer needs, quality management, and customer satisfaction. *International Journal of Production Economics*, 66(1), 77–96. [http://doi.org/10.1016/S0925-5273\(99\)00114-0](http://doi.org/10.1016/S0925-5273(99)00114-0)
- Ideo. (2011). Human centered design toolkit. Available Online at: <Http://www.ideo.com/work/human-Centered-Design-Toolkit/> [Accessed 12.07.2013], 200. <http://doi.org/9780984645701>
- Kelley, D. (2013). The Ideo Design Framework. *Rotman Management*, 31–31.
- Kolb, A., & Kolb D. A., Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education, *Academy of Management Learning & Education*. 2005, Vol. 4, No. 2, 193-212.
- Kolb, D. A. (1984). Experiential learning: Experience as the source of learning and development, David A. Kolb, Prentice-Hall International, Hemel Hempstead, Herts., 1984. No. of pages: xiii + 256. *Journal of Organizational Behavior*, 8, 359–360. <http://doi.org/10.1002/job.4030080408>
- Kolko, J. (2015). Design Thinking Comes of Age. *Harvard Business Review*, (September 2015). Retrieved from <https://hbr.org/2015/09/design-thinking-comes-of-age>
- Krippendorff, K. (1989). On the essential contexts of artifacts or on the proposition that design is making sense (of things), *Design Issues*, 5(2), 9-39
- Li-Tze, L., & Hung, J. (2015). Effects of blended e-Learning: a case study in higher education tax learning setting. *Human-centric Computing and Information Sciences* 5.1: 1-15.
- Manimala M. J., Creativity and Entrepreneurship (May 6, 2009). *Routledge companion to creativity*, Chapter 11, pp. 119-131, Rickards, T., Runco, M. A. and Moger, S., eds., London and New York: Routledge, Taylor & Francis Group, 2009.

- Manzini, E., & Vezzoli, C. (2003). A strategic design approach to develop sustainable product service systems: Examples taken from the “environmentally friendly innovation” Italian prize. *Journal of Cleaner Production*, 11(8 SPEC.), 851–857. [http://doi.org/10.1016/S0959-6526\(02\)00153-1](http://doi.org/10.1016/S0959-6526(02)00153-1)
- Maslow, A. H. (1955). Motivation and Personality. *Motivation and Personality*, 62–27. <http://doi.org/10.1037/h0039764>
- Morelli, N. (2003). DESIGN STUDIES: Product-service systems, a perspective shift for designers: A case study: the design of a telecentre. *Elsevier*, 24, 73–99.
- Mulgan, G. (2014). Design in public and social innovation: what works and what could work better. *NESTA*, nesta.org.uk.
- Rogoff, B., & Gardner, W. (1984). Adult guidance of cognitive development. In *Everyday cognition: Its development in social context*. (pp. 95–116).
- Sanders, E. B.-N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *CoDesign*, 4(1), 5–18. <http://doi.org/10.1080/15710880701875068>
- Snacking on “Learning Nuggets”, 2016. [Online] (Updated 2015) <http://www.mednetstudy.com/snacking-on-learning-nuggets>

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