

THE USER-DRIVEN CREATIVE ACADEMY

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ABSTRACT

Users have always been a point of focus in design, but in the beginning of the new millennium user-driven approaches and user-oriented projects were taken to a new level of recognition. As part of this development, the User Driven Creative Academy (U-CrAc) was created at Aalborg University as a cross-faculty platform. Today, the academy is an annual event, where approximately 150 students from different educations come together in a three-week interdisciplinary and user-oriented workshop. The academy is built upon Aalborg University's model for problem-based learning and includes close collaboration with industry partners.

The workshop format has, over the eight years of existence, undergone several changes with integration of different elements. The workshop design itself has been an iterative process in which the associated educators and researchers have explored new workshop structures, user-oriented methods and various design techniques. Elements of success were included in the following workshops, while others were excluded.

This research project shows that U-CrAc has changed dramatically from a methodological strict approach and highly controlled process by the educator team; to almost fully controlled by the project-teams within the overall structure of U-CrAc. This of course implies changes in the pedagogical approach, as well as in the students' type of realization of the subject matter. Moreover, the study shows a general tendency of expanding the instructional lectures, e.g. how to conduct the fieldwork, to also address and facilitate the alignment of the interdisciplinary student teams in both generating new user insights and developing design parameters.

Keywords: User-oriented design, problem-based-learning, design methods, interdisciplinary teams.

1 INTRODUCTION

Design is argued to distinguish themselves from other creative and purposeful activities by its human-centeredness[1]. One could even argue that the great attention and commitment in relation to the user or community for whom the design is intended, has always been there. However, in the new millennium there was a revival of user-driven projects and user-driven attention within the design community. It became a breeding ground for a myriad of methods within design-research, user-research or need finding [2], [3], [4]. The rise in the area of user-driven design in beginning of the new millennium became the basis for developing the User Driven Creative Academy at Aalborg University. But one thing is to have the methods and approached for user-oriented design, another thing is to purposefully unfold these in an educational context. The challenge in developing U-CrAc at Aalborg University was in particular to fit it into the problem-based-learning pedagogy, which is the basis of the university.

1.1 Problem Based Learning

Problem based learning (PBL) is pedagogy, which emphasise on practical application and experimental learning. PBL help students become active learners and become responsible for their own learning, because their learning is situated in self-selected real-world problems [5], [6]. Students learn by solving complex problems with no single correct answer, and by reflecting on their experiences [7]. The goals of PBL is to help students 1) construct an extensive and flexible knowledge base; 2) develop effective problem-solving skills; 3) develop self-directed, lifelong learning skills; 4) become effective collaborators; and 5) become intrinsically motivated to learn [8]

The role of the educator/supervisor is also different in PLB compared to more traditional learning setups. The educator is guiding the students through the learning-process primarily through the use of questioning strategies [9]. The educator is monitoring the students' process, and assures that all students are involved and encouraged to externalize their own thinking as well as commenting on the other students thinking [10].

1.2 PBL and different modes of realization

In order to provide an understanding of how PLB differentiate itself from other modes of learning, it can be beneficial to look at models for realization. According to Kolb [11], there are four types of realization: The first one is *assimilative* realization. Here new insights are applied to already existing cognitive structures. This means that your existing understanding of things is the basis for understanding and applying meaning to new knowledge. And accordingly your knowledge or skills in the particular area is refined and nuanced. The second type of realization is *accommodative* realization, which means that conventional thinking is broken. Here new knowledge is not only applied to what you already know. Instead new cognitive structures are created. Accommodative realization is therefore also the basis for creativity and innovation. The third type of realization is *convergent* realization, which means creating a certain output based on a given input. In order for this to happen, you need to master a certain subject area (i.e. interviewing) and its procedures in order to solve a specific problem. Once you have learned the procedures you are able to do it again and again. The fourth type of realization is *divergent* realization, which means creating different outputs based on the same input. In divergent thinking there is more than one right solution, there is no 'correct answer' and typically you only know the symptoms of what could be wrong. To handle divergent thinking one has to develop problem-solving skills. Based on Kolb's types of realization, Illeris has created a didactic model [12].

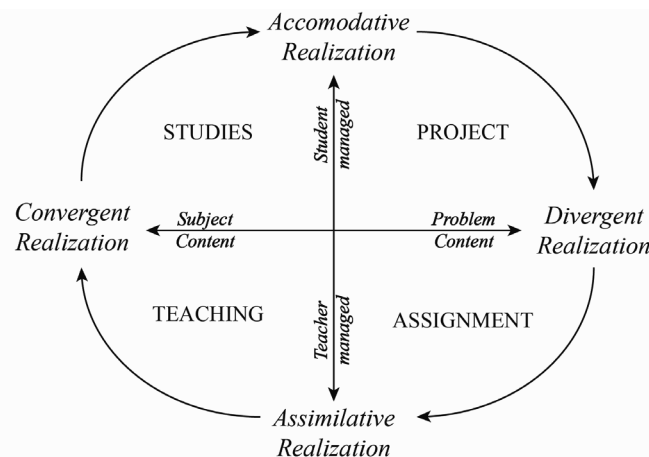


Figure 1. A didactic model [12, p. 269, own translation]

The didactic model has two axes. One spanning from participant/student controlled to teacher controlled and one spanning from subject content to problem content. If the participant/student is in control, it points to accommodative realization, because he reflects on earlier experiences or procedures. Here, the student either work on a project or is absorbed in supplementary literature. If the teacher is in control, it points toward assimilative realization, because the learning that happens is based on the teachers systematic planning of the subject content – either through lectures, assignments or combinations. At the other axis, if the focus is in the subject content, it point to convergent realization, and similarly if the content focus is on a problem it points towards divergent realization. PBL (in its pure form) is positioned in upper right corner of Illieris' model, as it is both problem-oriented and mainly student controlled. In other words PBL point toward accommodative and divergent recognition. However, as the next section will reveal, the degree to which PBL is implemented in a specific course or project module, may influence this position, even at a PBL university.

1.3 The implementation of PBL in the design educations at AAU

In the design educations at Aalborg University, PBL is implemented to various degrees and in various ways. At Aalborg University every semester is divided into a larger project module and smaller course-modules. PBL is particularly well implemented into the project modules, where students work in project-organized teams. Here, they identify complex or ill-defined problems [13] i.e. in a specific user context and unfold the problem through research and ideation on the solution in the form of a product-, service- or experience design. In the project modules in general, it is possible to argue that accommodative and divergent realization takes place. In the course-modules on the other hand PBL is not that rigorously implemented typically because the learning objectives in the courses are to teach the students specific subject content.

The aim of this study is to look at a course-module: User-Driven Creative Academy, with a devoted focus on the application of PBL. This research project map out the changes made in the workshop structure; in the applied user-oriented methods and various design techniques over the 8 years in which the course has been running, and explores how these changes influences the pedagogical approach, as well as the students' type of realization of the subject matter.

2 METHODOLOGY

As mentioned above the empirical basis for this research project is the course: U-CrAc (User-driven Creative Academy). U-CrAc is a result of the research project LUDINNO, which stands for playful innovation [14]. In U-CrAc the students address problems in cases that are provided by clients from industry. Typically, the clients ask the students to work on an open-ended challenge, that they are facing or on a project in its early development. The clients also provide access to the context of use related to the given case; and they meet the students weekly to engage in dialogue with them. The client-meetings have several purposes in relation to the three phases of the U-CrAc workshop being a fluid iterative progression between 1) Field work, 2) Ideation and 3) Concept development. At the first meeting the students are asked to seek the necessary information to carry out the following field study. In second meeting students are to present and discuss their findings from the field study with their clients. In the third meeting this students are to present three to eight video sketches for the clients.

Throughout the workshop we are very concerned about providing the students with methods that are enabling the involved students to participate despite their educational background; that support collaboration and that equalize the power relations among them[15]. Therefore video was chosen as a consistent media throughout the workshop in the first years – this was, however, changed over the years and it is this alternation that we will discuss in the paper.



Figure 2. Example of student project on remote interaction for televisions (see ucrac.dk/concept)

More concretely we will focus on how the students are guided and methodologically equipped in the teaching situation for the second meeting where the students are to present their insights from the fieldwork. We will not focus on the instructions given for how to conduct fieldwork, nor how their further design process unfolded.

U-CrAc serves several purposes – it's a pedagogical activity directed towards teaching user-centred design, agile development and interdisciplinary collaboration to students, but it also serves the purpose of being a context for exploring and testing new methods and techniques. Throughout the years U-CrAc has been the context for exploring animation-based sketching[16], the interpretation and articulation of field observation through material storytelling [17] and the Service Ouroborus [18].

U-CrAc should not be considered as a test bed (a platform for rigorous, transparent, and replicable testing to deepening the knowledge within a certain defined area), but rather as a platform for exploration. In this sense U-CrAc can be useful in expansive research projects, which strive towards broadening a domain rather than deepening. The research activities within U-CrAc are therefore typically research *on* design [19] in which a new method or technique is applied. In this research project we, however, have chosen as different research methodology as it it's the evolvement of U-CrAc, which is under investigation. We have mapped out the deployed methods with the given student instructions to generate a coherent representation of the progression and in order depict the pedagogical notion behind. The mapping supports us in analyzing the progression with a professional distance, which was required as we were part of the progression ourselves. Finally, the mapping is discussed in relation to the Illeris' didactic model [12] to elaborate on the methodological progression and the pedagogical transformation.

3 ANALYSIS AND FINDINGS

In the following we will present a framework where the purpose of mapping out the applied methods throughout the years. The framework will not only include the applied methods but also illustrate their relation to the pedagogical approach. In the sense the framework will illustrate the progression of the U-CrAc workshop in regards to the Applied methods as well as the behind laying pedagogical thoughts, which will be discussed later.

Year:	Duration and phases:	Involved educations:	Introduced methods in the fieldwork phase:	Workshop structure and Pedagogical approach:
2008	4 weeks Fieldwork Analysis Ideation Concept development	Industrial design Interactive Digital Media Experience design	Video Card Game	Detailed instructions and strict timetables
2009	3 weeks Fieldwork/Analysis Ideation Concept development	Industrial design Interactive Digital Media Experience design Occupational therapy	Video Card Game	Detailed instructions and strict timetables
2010	3 weeks Fieldwork/Analysis Ideation Concept development	Industrial design Interactive Digital Media Experience design Occupational therapy	Video Card Game	Instructions and guiding timetables
2011	3 weeks Fieldwork/Analysis Ideation Concept development	Industrial design Interactive Digital Media Experience design Occupational therapy	Video Card Game	Instructions and guiding timetables
2012	3 weeks Fieldwork/Analysis Ideation Concept development	Industrial design Interactive Digital Media Experience design Occupational therapy Product development and technical intervention	Video Poker Material Storytelling	Guidelines and goals of achievement
2013	3 weeks Fieldwork/Analysis Ideation Concept development	Industrial design Interactive Digital Media Experience design Entrepreneurial Engineering Nursing Occupational therapy Natural and Cultural Heritage Management	Innovation tracks Material Storytelling The Service Ouroboros Video Poker	Guidelines and goals of achievement
2014	3 weeks Fieldwork/Analysis Ideation Concept development	Industrial design Interactive Digital Media Experience design Entrepreneurial Engineering Natural and Cultural Heritage Management	Material Storytelling The Service Ouroboros Video Poker	Guidelines and goals of achievement
2015	3 weeks Fieldwork/Analysis Ideation Concept development	Industrial design Interactive Digital Media Experience design Entrepreneurial Engineering Natural and Cultural Heritage Management	Innovation tracks Material Storytelling The Service Ouroboros Video Poker	Guidelines and goals of achievement

Figure 3. Framework of the U-CrAc changes

In the framework provided above the methodological progression is reviewed and here it is shown how the methods were the same in the first years workshop. In these years the students were asked to follow a strict methodological guideline with an equally strict time schedule to ensure a proper progression within the short time span. This was especially evident in the methodological introduction to the Video Card Game[20]. Here the students were instructed to select and prepare a certain amount of the video cards for the following workshop. For the workshop a detailed time schedule were provided that to the minute defined what the student had to carry out in their interaction with the clients. In the sense the students were given a certain assignment that they had to fulfil in order to follow the progression of the workshop. This educational approach leaves limited space for the students to adjust the method for their given case, which we found to be limiting the design work as they sometimes were not able to collect primer video material to facilitate a video card game workshop. In order to meet this challenge of the students we decided to provide them with a variation of methods to choose from. First we expanded the methodological toolkit with a method, which we named Video Poker. In Video Poker the students should not follow a certain time schedule nor should they have a certain amount of video cards. Instead, the students were asked to utilize the collected video material for the field study to the degree that the material afforded. In addition the students should now facilitate a dialogue with the clients in which the video cards with the associated video snippets [21] were employed to support the ongoing dialogue rather than providing the frames for discussion. This didn't solve the problem for the students without having any or proper video material from their field study. To face this challenge we introduced the method was Material Storytelling [22], which prior had proven valuable to facilitate rich discussions among its participants. The methodological toolbox was later further expanded with the Service Ouroboros [18] was introduced to facilitate the service related cases.

4 CONCLUSION AND DISCUSSION

Over the years U-CrAc has changed from a workshop, which was planned in detail down to 30 minutes timeslot in order to ensure the teams' progression to a workshop, where the student teams are in charge of structuring the projects by selecting between a variation of methods and approaches. Exchanging detailed instructions with suggestive guidelines did not only support the design process better, it also affected the students in various ways, including their type of realization.

When the students are in charge of the method selection, it requires them to have a critical reflection upon the afforded methods in relation to their case and the ethnographic material at hand. Prior, the students were just required to consider and reflect upon *how* a given method was carried out – now in addition they had to reflect upon which of the provided methods were best suited. As part of the free selection of methods, the students were further motivated to modify and adjust the provided methods to fit the given case better. This triggered another level of reflection in respect to the methods. The students were no longer just concerned with which method to apply, but also how to apply and adjust it.

This level of reflection and the type of activity that the students here engage in can be understood as a movement within Illris's didactic model from assimilative/deductive realization (assignment) to accommodative/deductive realization (project), due to the fact that the students are more actively engaged in the selection and application of methods; and hereby new cognitive structures for handling this process is created. We argue that prior the students gained good practical method skills within the selected methods, while they now in the new workshop set up gains another type of knowledge. We believe that the students here initiate the process of becoming competent to select appropriated methods in relation to the given circumstances in the on-going project. We would like to argue that the students here are required to consider issues such as goal, means, time and available competences etc., which raises the level of reflection and provides them with a way of thinking that can be applied to future projects instead of learning a certain method, which might/might not prove useful later on.

Initially, the changes made in U-CrAc structure were a matter of practicalities. As educators we changed the structure to accommodate different challenges the students teams had (i.e. not having sufficient video-material) in order to improve the workshop. The indirect effect, these changes had on the didactic model were not intended, but in hindsight it has been very valuable for the workshop as well as for our own realization of, what it takes to implement PBL into course modules.

REFERENCES

- [1] K. Krippendorff, *The semantic turn - a new foundation for design*. New York: CRC Press/ Taylor and Francis Group, 2006.
- [2] M. P., W. T, S. B, and V. D, *Subject to change: Great products and services for an uncertain world*. Sebastopol: O'Reilly Media, 2008.
- [3] L. B, *Design Research Methods and Perspectives*. London: The MIT Press, 2003.
- [4] E. B. Sanders, E. Corte-real, D. Durling, R. Luck, E. Arnould, and K. Friedman, "Design Research in 2006 From the Communications Secretary :," *Res. Q.*, no. September, pp. 1–8, 2006.
- [5] A. Collins, J. S. Brown, and S. E. Newman, "Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics," in *Knowing, Learning, and Instruction: Essays in Honor of Robert Glaser*, L. B. Resnick, Ed. Hillsdale, NJ: Erlbaum, 1989, pp. 453–494.
- [6] E. C. Hmelo and M. Ferrari, "The problem-based learning tutorial: Cultivating higher- order thinking skills," *J. Educ. Gift.*, vol. 20, pp. 401–422, 1997.
- [7] H. S. Barrows and R. Tamblyn, *Problem-Based Learning: An Approach to Medical Education*. New York: Springer, 1980.
- [8] C. E. Hmelo-Silver, "Problem-Based Learning: What and How Do Students Learn?," *Educ. Psychol. Rev.*, vol. 16, no. 3, pp. 235–266, 2004.
- [9] C. E. Hmelo-Silver and H. S. Barrows, "Goals and strategies of a constructivist teacher," New Orleans, 2002.
- [10] T. D. Koschmann, A. C. Myers, P. J. Feltovich, and H. S. Barrows, "Using Technology to Assist in Realizing Effective Learning and Instruction: A Principled Approach to the Use of Computers in Collaborative Learning," *J. Learn. Sci.*, vol. 3, no. 3, pp. 227–264, 1994.
- [11] D. A. Kolb, *Experiential Learning*. Englewood Cliffs: Prentice-Hall, 1984.
- [12] K. Illeris, "Læring, Udvikling og Uddannelse - udarbejdelse af en Piaget-inspireret pædagogisk forståelsesramme," in *Voksenliv og læreprocesser i det moderne samfund*, B. G. Hansen, B. Jacobsen, C. N. Jensen, and A. Tams, Eds. København: Munksgaard, 1997.
- [13] J. C. Thomas and C. J. M, "The Psychological Study of Design," *Des. Stud.*, vol. 1, no. 1, pp. 5–11, 1979.
- [14] T. Edman, M. Keitsch, T. Vavik, N. Morelli, S. B. Poulsen, I. Koskinen, and S. Holmlid, "LUDINNO - Learning Labs for User-Driven Innovation," Oslo, Norway, 2010.
- [15] S. B. Poulsen and C. Rosenstand, "Reflekterende innovativ workshop," in *Prakiselementet i iværksætter- og innovationsundervisningen*, J. Slot and C. Vintergaard, Eds. Holbæk: Copenhagen Business School Press, 2009, pp. 27–40.
- [16] P. Vistisen, T. Jensen, and S. B. Poulsen, "Animating the Ethical Demand: Exploring user dispositions in industry innovation cases through animation-based sketching," *Comput. Soc. (Online Ed.)*, vol. 45, no. 3, pp. 318–326, 2015.
- [17] S. B. Poulsen and A. M. C. Strand, "A creative designerly touch: Nurturing transformation through creativity in the meaning-mattering of design processes," *Akad. kvarter*, vol. 9, pp. 277–290, 2015.
- [18] S. Gudiksen and E. Brandt, "The service Ouroboros: Designing persona service cycles," in *ServDes. 2014: Service Futures.*, 2014, p. journal no. 99.
- [19] C. Frayling, "Research in Art and Design," *Royal College of Art Research Papers*, vol. 1. pp. 1–5, 1993.
- [20] J. Buur and A. Soendergaard, "Video card game: an augmented environment for user centred design discussions," *Proc. DARE 2000 Des. Augment. Real. Environ.*, pp. 63–69, 2000.
- [21] M. Johansson, "Participatory Inquiry - Collaborative design," Malmö University, 2005.
- [22] A. M. C. Strand, "Enacting the Between: On dis/continuous intra-active becoming of/through an Apparatus of Material Storytelling. Book 1: Posing (an Apparatus of) Material Storytelling as discontinuous intra-active rework of organizational practices," Aalborg University, 2012.