



DESIGNING FOR ONE; *HOW ADJUSTING VARIABLES INFLUENCED DESIGN STUDENT CREATIVITY*

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Abstract: Since 2011, my colleague and I have been teaching Master’s students about designing together with people with dementia. It is a simple, open-ended assignment brief: to make a person with dementia’s life ‘more pleasant’. Including students from various design disciplines, they often create ‘unexpected’ designs, which are not necessarily linked to their discipline. Each project is driven by a need for the design to suit the individual person they are working with, their preferences, abilities and context. Looking into what might foster these unexpected qualities, this paper reflects on the module, shares its processes, example outcomes, and tries to map the variables within the course that are *extending the design space* as proposed by Gero and Kumar. Finally, the paper suggests that other design educators can use these to initiate creativity within their own teaching practice.

Keywords: *Design Education, Designing for One, Creativity, Participatory Design, Dementia*

1.0 Introduction

Several years ago, my colleague and I began teaching a design course for Masters students on designing together with people with dementia. As part of this module, students were individually paired up with a person with dementia with the brief to make this person’s life ‘more pleasant’. Open to students from various design disciplines, students often create ‘unexpected’ designs; projects that are different from each other, in some cases not linked to their discipline, but driven by the need for the thing designed to suit the person its context of use. As lecturers, we began looking into what was happening in our approach that was different from other modules, analysing the context, and testing if this would also have similar results in other contexts. Through initial analysis, we suggest that this approach is providing an opportunity for the students to be *creative*, perhaps in contrast to other, more prescriptive domain-based modules they have. This paper’s intention is to identify variables within the module that extend the design space as defined by Gero and Kumar and call for other educators to explore this area as well.

2.0 Reflecting on how we teach

2.1 Our research practice

The design educational module that we have created (Dementia Lab Module) is based on principles of Participatory Design (PD) and linked to our own experience as designer/researchers. The purpose of this paper is not to debate the impact, type or level of involvement in co-creation that the person with dementia has, but acknowledges that we prioritise the involvement of the participant: PD's value of working with the marginalised and underprivileged (Carroll & Rosson 2007, p. 243) and empowering "groups of people whose views, opinions and needs might be the most ignored by mainstream society" (Vines et. al. 2013, p. 430). This moral position is at the heart of our research approach. When we design 'together with', we focus our attention on personal interaction, the needs and abilities of one person with dementia instead of a user group. Although the focus of our approach is on the individual, it also places value on the network and context of care/carers surrounding the person with dementia (Hendriks et. al. 2014) and considers how knowing and making something for one person can result in a transferable/generalisable design: designing for many via *designing for one* (Wilkinson et. al. 2017).

2.2 A shift in teaching practice

The first Dementia Lab module began over six years ago as a crossover between researcher and design education. For us, the crossover made sense. We recognised this as a socially relevant theme and believed that the challenges the students would face would make them better, more empathetic designers (Koupric & Visser 2009). When we began, we followed a formal brief structure. Dementia was the topic and students were asked to respond to this based on one-off observations in a care facility, personal knowledge of dementia, and secondary sources (films, articles, graphic novels, etc.). From the second iteration, however, we paralleled our own research: dementia as experienced by an individual, designing for one, shifting the focus from the condition itself to how the condition impacts an individual and their needs, abilities and context of use. It is how this combination of need, ability and context manifests within the resulting design that gives evidence of the importance of this relationship: had the one to one interaction between student and participant not taken place, the design would inherently be different. This proximity between designer and user brings the student closer to an understanding of designs that fail, but also brings the process into the realm of something meaningful.

Years later, the course is run off campus within a care facility. This change in location provides the students time and availability to meet family members, meet regularly with their participant, and continue to familiarise themselves with the environment. The student's stigma about the context or anxiety quickly diminishes. The facility notifies family on the forehand and families are able to opt-out of participation. Although we have taught the module in other countries, with other levels of students, the students in the module referred to in this paper, are Masters-level students. Despite the fact that some students have first-hand experience with dementia, the course begins with an overview of what dementia is and how this can impact a person's life. This is supplemented by role-playing techniques and best practices for interacting with the residents. Next, the care facility presents their 'vision' on caring for people with dementia and their house-rules. Following this, the students begin a 'deep dive' in which they shadow various care teams over the course of a day to better understand the routine of the facility and get to know the carers and residents. During this 9-week module, the students are coached by the lecturers about methodology and process and the students are required to interact with their participant at least once per week. Feedback from carers and family members is ongoing. The following is an overview of the research insights/milestones that the students try to achieve each week:

- **Week 1:** Learn about the care environment, the day-to-day context in which the person is living.
Select an individual to work with based on personal connection, shared interest, etc.
- **Week 2-3:** Get to know the person with dementia as an individual, discover his/her interests and personal history, problem areas, communication abilities and what objects he/she uses.
- **Week 4-5:** The student creates 'design tools' to help him/her better understand issues, interests and use related to the design direction he/she is interested in pursuing.
- **Week 6-8:** Students create prototypes which respond to this 'design direction' and test them in the care facility and context in which they will be used.

- **Week 9:** Students share their results in a ‘Presentation Market’ in which other residents, staff, family members are able to find out about what was created. Students must also incorporate ‘saying goodbye’ to the participant as the project is now over.

2.3 An example of process and outcomes

To provide insight into the students’ experiences and process, what follows is a *thicker* description taken from a student’s first-person reflection and process documentation.

Dorien’s participant was named Fernand. He was unmarried, had no children and had been a high school mathematics teacher. He had always been close to his niece who was his sole surviving relative and, although she lived in another town, she visited him often. His niece recalled him as a ‘joker’ who until recently was able to communicate and interact with her at a level reminiscent of the uncle she had always known. Since losing his ability to verbally communicate, however, she had difficulty recognising him as this person she knew and cared for and was considering no longer visiting. Dorien struggled with this and wanted to create a project that would facilitate interaction between them.

During this project I got to know Fernand by spending time with him, but also by talking to his nurses and speaking with his niece. He used to be a maths teacher and until recently would like to quiz nurses and visitors on their multiplication tables. This made me want to create an activity that would tap into his interest in maths. During the course of this module I made several tests working with numbers and objects. I noticed that instead of focussing on the numbers, he was perhaps tapping into a mathematical sense of organisation and symmetry. He kept small things in order, such as aligning a napkin to the edge of the table. This became a game we played, I would mess up the napkin and he would place it back again; he seemed to enjoy this. I had wanted to do a project with numbers, but through the time spent with him I realised that he was enjoying small interactions in the day. I realised that it was up to me to be aware of these small things, like just being with him, physically touching his arm and small walks in the corridor together. Instead of wanting to design something to stimulate an activity, I decided instead to focus on the little things. I created a toolkit aimed at his niece; through the use of the toolkit she would become aware of Fernand’s appreciation of her presence and the time they spent together. In my ‘Do Nothing Kit’ I placed tools: a shiny pendant, different tactile objects as well as various assignments like sitting in the sun, or holding a hand... The toolkit also asks that the user makes time for reflection after a visit to reflect on these moments: which did they find the most rewarding?; which did they think were the most rewarding for their loved one?

At the final presentation moment, the head nurse was visibly moved. She said the project was ‘great’ and she would have never expected a student to have this level of reflection in such a short time. She said it was a tool she had been needing for years to give people struggling to make connections with their family member the ability to reconnect.

For Dorien, this was not a film animation project. This ‘greatness’ had nothing to do with the aesthetic qualities of the end result (which is also not module’s focus), but rather the design’s ability to facilitate human connectedness. Her project responded to a need presented not only by the niece, but resonated with the care centre staff. For fellow lecturers, they were ‘surprised’ that an animation student would create a physical product, which is not an expected outcome from a film-animation module. Dorien’s project (as well as other student outcomes) are *unexpected* both in terms of the novelty of the idea as well as the fact that these ideas come from students from diverse disciplines. Students create everything from card games for facilitating household tasks (Graphic Design student) to audio cycling tours (Film student) to placemat games (Photography student) to personalised videos (Product Design student) to tactile magazines (Film student) to age-appropriate colouring books (Graphic Design student) to theme-based, in-house walking tours (Interaction Design student) to drinking aids (Digital Design student)...

For us as lecturers, in what may seem tinged with irony to those outside of design education, we do not use the word *creative* in reference to these projects; we may use words like innovative, novel or original or even say things like “I’ve not seen that before” but it is only through this analysis that we are recognising these ‘unexpected’ results as evidence of creativity and suggesting that variables within the module are facilitating this creating. Because of our interest in educational practice, we began investigating the module’s format and process, looking for elements that were different to other modules that were perhaps leading to these *creative* end results.

3.0 Identifying creativity

3.1 Defining creativity

When we began looking more closely into texts on the idea of creativity, we needed to understand it relating to design. We found it to be linked to originality; a newness or unexpected nature but discovered it was also tethered to effectiveness (Runco & Jaeger, 2012). In some texts it was described as deviating from the “traditional or status quo” but, much like effectiveness, also needed to address a problem (Stein, 1953 as cited by Runco & Jaeger, 2012). Not intended to debate the distinction between artist and designer, it was also important for us to understand how creative people, such as designers, defined creativity. Glück et. al suggest that they fall under the title of *constrained artists*; working within the “reality of professional creative work”, with “various constraints, such as limited financial resources, technical possibilities, and even external demands regarding the style of the creative product” (2002). Making a link with design education, these constraints are possibly the same, at times limiting creativity in the classroom as coursework can be prescriptive, with predefined outcomes and documentation requirements. In their study, Glück et. al.’s real-world designers prioritised function over originality, valuing instead “creative ideas within a framework of constraints, and the value that creative work has for others” (2002). These findings resonated with what we are seeing in the classroom.

3.2 Opportunities for creativity in the design process

The analysis into the module also looked to the design process as a source of difference. The design process (how designs come to be) is specifically made to generate multiple options, and it is this plenitude of options that causes the design process to be rife with potential missteps. We considered that there were perhaps key variables in the process that were enabling these results; maybe it was particular processes we were adding or modifying. In his seminal text on Design Process, Lawson proposes that design involves compromise: there are “no optimal solutions to design problems but rather a whole range of acceptable solutions (if only the designers can think of them), each likely to prove more or less satisfactory in different ways and to different clients or users” (2014). Unlike a math equation, which leads to one particular result, or a science experiment which leads to an expected result, even the most ‘beautiful’ and ‘perfectly designed thing’ is merely the end-point of a long list of choices that all indirectly/directly or insignificantly/significantly impact the end result.

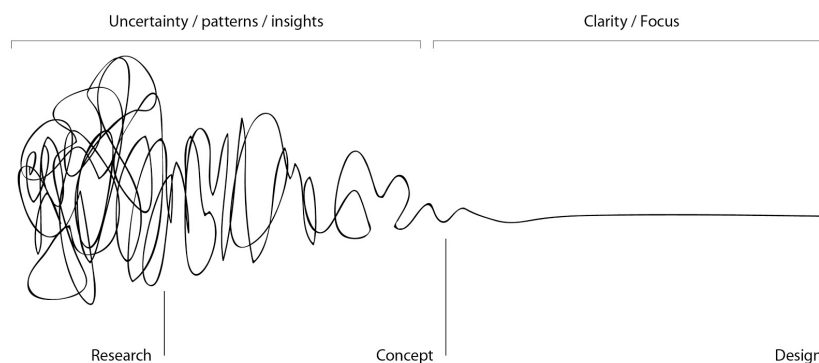


Figure 1. The Design Squiggle (Newman 2007)

One visualisation of the design process, which brings these possibilities and decisions into view, is Newman's *Design Squiggle* (2007). Beginning seemingly out of nothing, its chaotic initial design line highlights the messiness and chance related to designing (fig. 1). This messiness is what many refer to as 'the fuzzy front end' of design where "it is often not known whether the deliverable of the design process will be a product, a service, an interface, a building, etc... The goal of the explorations in the front end is to determine what is to be designed, and sometimes what should not be designed" (Sanders & Stappers, 2008). For our way of working, and this designing for one approach, this fuzziness is important; it leaves questions without answers, gaps which need to be addressed, contact with others for feedback and critique... It was this insight which began our process of articulating points of difference.

3.3 Extending the design space

The design squiggle alludes to the inherent 'possibility' that exists within the design process; the possibility for different influences to lead to alternative directions and therefore other designs. It is precisely these alternatives and new influences (illustrated in the Design Squiggle with lines intersecting and looping back upon themselves) that are central to the *surprise* and *unexpectedness* which creativity requires (Boden, 2007). However we were aware that squiggles and possibility don't always lead to a *creative* design. They may lead to suitable and beautiful solutions, but not necessarily *unexpected* or *creative* ones. For students and designers alike, the challenge is nearly always how to maintain creativity, staving off falling victim to *normality*, where design becomes so routine that all of the variables in the decision-making process "are known *a priori*" or already known (Gero & Kumar 1993, p. 220). Illustrating this concept, Gero and Kumar suggest that by *extending a design space*, the action of designing moves beyond that which is familiar. This is what Boden also refers to as *exploratory creativity*; extending the design space beyond simple *unfamiliar combinations of familiar ideas* (2007, p. 85). Following on from this logic, these unfamiliar variables can call into question the limitations of disciplines, and may even generate new areas of practice; they enable "someone to see possibilities they hadn't glimpsed before. They may even start to ask just what limits, and just what potential, this style of thinking has" (Boden 2007, p. 87).

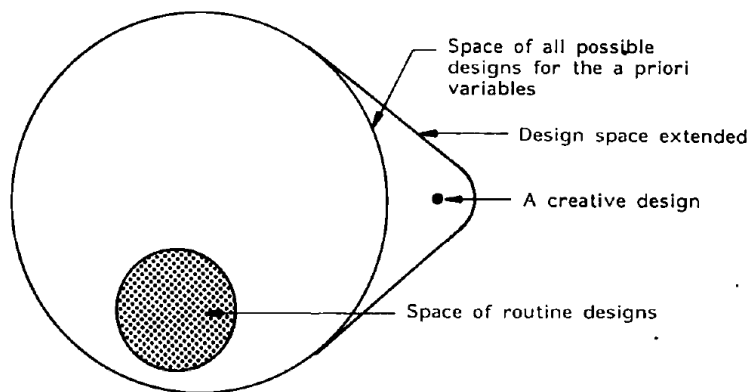


Figure 2. Space of routine and creative designs (Gero & Kumar 1993)

Using the graphic design discipline as an example, the standard design problems presented from clients or in student briefs fit within Boden's *unfamiliar combinations of familiar ideas*. Although responding to a standard graphic communication problem satisfies a design process, the process falls prey to the *routine*. It is limited by known and familiar variables: medium, layout, format, colour palettes, type of imagery, use of language, etc., which can be used in unlimited combinations to produce every possible graphical outcome. Whilst experimentation within these familiar variables is still important to the design discipline, critics refer back to one of the trademarks of creativity: function. As we discovered, designs must be judged by their "relevance and effectiveness" (Buchanan 1992, p.12) or what Boden describes as "coming up with a surprising, valuable idea" (2007, p.85).

What is specifically interesting about Gero and Kumar’s work, is that they suggest that new influences (or what we are calling variables) can be harnessed to produce “solutions where feasible solutions do not exist in the current solution space... improve on solutions already found” (Gero & Kumar 1993, p. 219). They go so far to even propose guidelines for when it might be beneficial to introduce new influences into the design process:

- “When routine design procedures do not yield any design solution
- When optimization procedures indicate there are no feasible solutions
- When the designer or user desires better or different designs” (Gero & Kumar 1993 p. 211)

What then are some influences we have identified (changes of variables in the design process or how a course is structured) that design educators can use?

3.4 The variables which extend the space

Although my colleague and I didn’t set out initially to push the boundaries, or indeed know that we were extending the design space within our teaching practice, the values we held as design researchers necessitated it. Our own research had gone through this transformation process; precisely in fact due to circumstances Gero and Kumar call attention to. Referring back to the course with Master’s students, evidence of Gero and Kumar’s *extended design* space or Boden’s *territory of the unfamiliar* are evidenced when our Master’s module is contrasted against a similar course (in length, specialised student skill level, within a specific discipline, ie. graphic design..., with a similar lecture structure and a similar level of interaction between lecturers and students). The comparison reflects on how a topic is handled, with the Dementia Lab focussing on dementia and the other focussing, in this example, on the creation of the annual publication of a cultural centre’s events. It is important to note that this paper finds no fault in the process/timing/content of a *Standard Discipline Module*. As Schön suggests, a module such as this enables an emerging designer to specialise within their discipline by creating a “repertoire of expectations, images and techniques” that they can draw upon when working in similar cases in the future (2008). In contrast, the Dementia Lab Module causes friction within these, tapping into Boden’s *unfamiliar* (2007) and Shklovsky’s idea of *defamiliarization* (2015). A technique often referred to within literature, defamiliarization “compels the reader to examine their automated perceptions of that which is so familiar that it seems natural and so unquestionable” (Shklovsky, 2015). Each of the following variables (Table 1.) are precisely that: little shake-ups of our students’ expectations of design; what they are familiar with, the methods they use, etc.

Table 1. Differences between Dementia Lab Module and a Typical Discipline Module

Variable	The Dementia Lab Module	Standard Discipline Module
Location	The course is in a care facility	The course is run on campus.
Environment	On location within a care facility: with all its smells, sounds, experiences is part of the design context	In a classroom which may or may not have specific relevancy to the design problem
Interaction	Students are paired with an individual with dementia	Students interact with the client (a representative of the cultural centre)
Involvement	The family/carers of the person with dementia are involved in the student project and make relevant information available (personal history, imagery, additional contact details, objects, time) to support the student’s project.	Students may visit the cultural centre. Students collect imagery/content related to the client’s wishes. Students become familiar with existing communication material (website, previous annual publications, etc.).
Methodology	Students must adapt research methods to suit the situation as no method can be used ‘off the shelf’.	Students can draw from an extensive list of design research methodologies and match need with outcome.
Real-world Context:	The design created must fit into the real care context and be sensitive to time	The context of the design is understood by student and supplemented by

	involved, hygiene, privacy, physical limitations etc.	potential persona creation, demographics supplied by the client or generated through research.
Communication	Communication can be challenging as the participant may have limited verbal communication. Communication with those involved (lecturers, the family, care staff, etc.) is verbal/written but can conflict with each other.	Communication between those giving feedback (lecturers, classmates, client) is via presentations that are based on verbal/written communication.
Unknown end-result	The brief for the students is open, they don't know on the first day what they will make, only what process they are beginning.	Well-defined outcomes in terms of medium or use-context: publication, website, and style to be potentially used across media.
Importance of Failing	In the care setting, if a prototype doesn't work, the impact is tangible: the design fails to engage the person as required or does not fit into the context of care and will not be used. The design is unsuccessful and caregivers or family members will not use the design.	All prototypes which respond to the call of the brief within the given timeframe and with the delivered content are 'successful'. Failing is defined by not supplying a design that meets the requirements set about in the brief. Client judges design heavily on aesthetic appeal for intended audience as related to brief.
Unfamiliar context	For most students, the subject of dementia is new. It brings challenges they have not yet had to think about in relation to their discipline. The methods they use within their discipline in relation to discovering more about their users must be adapted.	Although the students may not have created a publication for a cultural centre or visit cultural events, they are familiar with design attributes as related to publication and website design. They may see themselves as part of the intended audience.
Meaningfulness	The projects that the students create actually offer real impact by enabling conversations between family members, initiating activities between staff and the person with dementia, etc.	The project is a clear client-designer relationship although a student can have a particular affinity for or place particular importance on the value of the cultural centre, the Arts, etc.

4.0 In Conclusion: reflecting on a way forward

Acknowledging that we are not authorities in the field of design creativity, this paper is the beginning of continued research and reflection into this space. From our own experience as design educators, shifting coursework into this unknown territory comes with additional risk and requires additional planning, logistical support, enthusiasm and the room to fail or deliver unexpected results. The unknown qualities lead to uncertainty for both the student as well as the lecturer and can be frustrating for both parties. One such frustration is that these variables cause us to not always know the answer. We use this as an opportunity to be open with our students about the process and together we plan a way forward. Another situation we have seen is that our students struggle with sharing the work made in our course with lecturers in their own disciplines, who in some cases have called projects *ugly* or *irrelevant* in relationship to their discipline. The expectations some disciplines have around medium or end-result are different to others who place more value on process. What we propose to students is that they have something equally important; a great story about a person with dementia and how they created a project that catered to his/her specific needs, abilities, wants. They have learned soft-skills, about being good listeners or better communicators as well as the importance of testing prototypes. In contrast, these unknown variables make teaching a *Standard Discipline Module* feel safe.

With this paper, we propose that for design educators looking to move away from *routine* design and provide opportunities for *creative* end results, shifting variables from the expected to the unexpected within the design process can help facilitate this challenge. Next to this, whether or not one sees the audience or potential audience as users, user-groups or individuals, creating space for their participation in the design process can extend the design space as it creates *an understanding of users and their situations or contexts* and these situations and contexts will inevitably be different than a student's own experience (Redström 2006). Finally, if this way of working is seen to be a template or road-map (off-site, marginalised user group, designing for one, open-ended design brief) then additional research needs to be done into what contexts or disciplines can best utilise this approach and further analysis should go into the experience of students and how they describe this phenomenon.

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