

# Using Self-Determination Theory to Support Co-Design Activities

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**Abstract.** Co-design has become increasingly valued within a wide variety of businesses and institutions for its capacity to improve the design of products and services by involving end-users in the design process. Self-determination theory is ultimately a theory of human motivation. It asserts that three basic psychological needs (for autonomy, competence and relatedness) must be met in order to facilitate motivation and wellbeing. This paper links these two concepts and hypothesises that co-design is a successful methodology insofar as it is able to support the satisfaction of these three basic psychological needs.

**Keywords:** Co-Design, Self-Determination theory, Motivation

## 1 Background

Co-design is a participatory design methodology that subverts the traditional division of labour in the creative process. It does this by welcoming end-users and other stakeholders into the design team and giving them creative control over what gets made [8]. This paper posits that the benchmark for success in a co-design process is getting strong, meaningful engagement from participants during the design phase and, ultimately, creating solutions that meet the needs of users. The co-design process generally involves running workshops with a group of users to design a solution to a particular problem. This solution could be a service, a product or a piece of technology. These sessions generally involve the use of tools to facilitate creativity - pens, paper, Post-Its and craft supplies are all used to explore ideas and rapidly create and test prototypes [2]. Co-design workshops also often involve the use of games, brainstorming, roleplaying and creative exercises [2]. These sessions are opportunities for end-users to contribute to the formation and design of something that they will eventually use.

This approach is in contrast to a more traditional paradigm in which design professionals are regarded as the experts and end-users are the objects of their study during the design phase and the passive recipients of their work once it is finished [3]. While participatory design processes have been around in some form or other since the 1970s, they only began to be taken seriously by the business community at the turn of the new millenium and are still by no means the norm [8]. The landscape of participatory design is still very much evolving and terms such as co-design and

co-creation are used in a number of ways and often conflated. This paper concurs with Sanders and Stappers in taking co-creation to refer to any “act of collective creativity” and co-design to be an example of co-creation, applied “across the whole span of a design process” [8, p.6]. This collaboration is between not only different design professionals, but also between designers and those not trained in design. Namely, the actual recipients of the solution being designed. However the process is defined, when products and services are designed by the people who will actually use them, the benefits for organisations can include “improving customers’ loyalty, reducing costs, increasing people’s well-being, and organizing innovation processes more effectively” [9, p.53].

This paper will focus not on the effects this methodology has on businesses and institutions, but the impact that this process has on the users actually involved in the design process. It will use self-determination theory (SDT) to propose an explanation for the apparent effects that the co-design process has on these users. This paper is informed both by reports of co-design work [8, 9, 11] and our own co-design work developing myPAL (My Personalised Adaptive Learning), an application within Leeds Institute of Medical Education. myPAL focuses on aggregating student learning data into one place in order to provide medical students with a view onto their data that puts their learning into context. It does this by presenting learning data in a way that lets medical students see patterns in the way they work and learn and therefore potentially become better at planning their learning activities. Within this project, we have thus-far conducted two iterative phases of co-design with students, clinicians and academic tutors to design and prototype new features within myPAL that focus on workplace learning [10].

Self-determination theory is primarily a theory of motivation. It asserts that humans are “active, growth-oriented organisms” who are naturally inclined to “engage in interesting activities, to exercise capacities [and] pursue connectedness in social groups” [1, p.227]. It refers to ‘intrinsic’ motivation as the inherent human tendency to “seek out novelty and challenges, to extend and exercise one’s capacities, to explore, and to learn” [7, p.70]. People are intrinsically motivated when they engage in an activity for its own sake and these activities “represent a principal source of enjoyment and vitality throughout life” [7, p.70]. Conversely, people are extrinsically motivated when they perform a task for reasons that lie outside of the act itself, such as threats, deadlines or material rewards [7]. SDT asserts that human motivation is inextricably linked with the satisfaction of three innate psychological needs for autonomy, competence and relatedness and that the right environmental conditions must be in place for these needs to be met [5]. This paper will explore these three basic psychological needs as they relate to co-design and posit that co-design is a successful methodology for supporting and engaging users in the design process in as far as it allows these needs to be met.

In our first round of co-design on the myPAL project, we wanted users to create visualisations using their workplace-based assessment data. In order

to help participants play with this dataset, we used the visual metaphor of an empty bowl, into which we placed pieces of paper representing different aspects of workplace assessment data [10]. We then asked students and tutors to draw out potentially interesting patterns from this mass of data and draw how they might be visualised on sheets of A3 paper. In total, participants came up with over 50 visualisations that we collated and refined into paper prototypes for the next phase of co-design. The initial myPAL co-design activities were not designed with self-determination theory in mind - the connection between the two concepts was made later and applied retroactively when the author realised the links between the two. Future myPAL activities will of course be designed with SDT in mind but, as will be explored in this paper, the two concepts seem to naturally coalesce in many important ways.

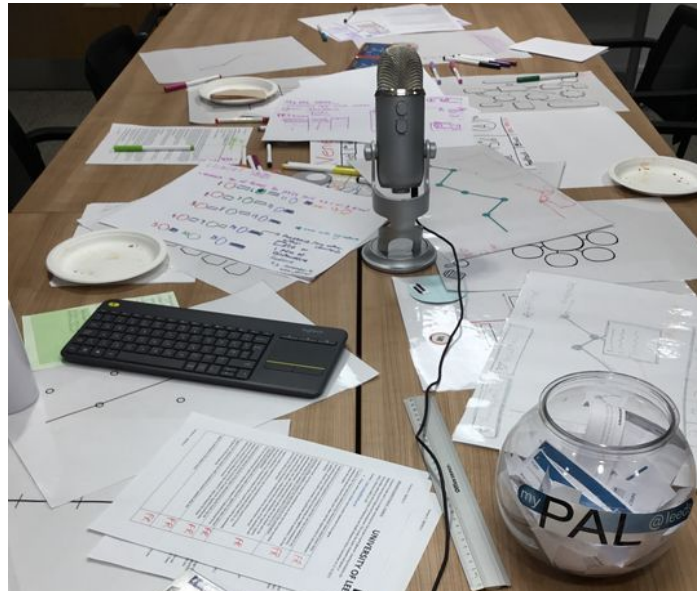
## **2 Linking Self-Determination Theory and Co-Design**

### **2.1 Autonomy**

In the context of SDT, autonomy refers to a person's experience of their behaviour as "volitional and reflectively self-endorsed" [5, p.135]. Situations are autonomy-supportive when they make people feel that they are in control of their own actions and that their participation in an activity happens because they themselves have decided to get involved. It also refers to a feeling of "having a voice" in a given situation and being able to do as they please, free from pressure and coercion [5, p.139]. An emphasis on self-determination can be particularly effective within the co-design process. As a methodology, co-design insists that traditional power structures within the design process be radically reevaluated and that control be partly taken from designers and businesspeople and given to users or consumers [8]. Co-design recognises that modern consumers are more informed than was imaginable ten years ago and increasingly want "a balance between passive consumption and the ability to actively choose what kinds of more creative experiences to engage in and how" [8, p.7]. While Sanders and Stappers refer here to 'consumers', these statements equally apply to users of technology-enhanced learning. Students are, after all, the consumers of such tools and they interact with them as consumers - deciding whether or not to adopt and use TEL tools and exhibiting "emotional, mental and behavioural responses" to these products [6, p.7].

Co-design supports the desire of technology users to become more actively involved by giving workshop participants an opportunity to have a much greater impact in shaping the services and products they use [4]. Contexts that support autonomy provide "choice and meaningful rationales for learning activities, acknowledging [users'] feelings about those topics, and minimizing pressure and control" [5, p.141]. Co-design emphasises to participants that they are in control - sessions are facilitated by a designer but it is made explicit to participants that they can make a real contribution to the work being done. Facilitators may have a plan for the session, but ultimately it is the participants who dictate the direction of both the

conversation and the solution itself. On some projects, it may even be appropriate to have a user-designer facilitate the entire session. At the very least, participants should be made aware that they have the authority to veto ideas and move the conversation along if they feel so inclined. One potential way of doing this would be to give participants voting cards to help them make decisions and make it easier to assert their influence.



*Figure 1. Materials from a co-design session*

Within a co-design process, this sense of control increases participants' "sense of ownership [over] the artefact and the process itself" [11, p.2]. The sense of ownership that the co-design process sparks in its user-designers is one of the key benefits of the approach. Proponents of co-design claim that this increases the chances of the solution being adopted by users, but most importantly, it changes the way that users view the solution. It provides them with a sense of agency with regards to their contributions and increases their intrinsic motivation to return to continue their development work. Indeed, within our own project, the rate at which students chose to return to the co-design process between sessions was 70%, evidencing that students felt a real commitment to the project [10, p.4]. This sense of commitment can be amplified if the results of this work "visibly contain [participants'] expressions, such as their handwriting, quotes, or pictures" [11, p.2]. For this reason, when creating prototypes based on user ideas, we tried as far as possible to retain the visual feel of the original designs. In addition, emphasising user voices in communicating project progress to the wider world underlines their centrality in the process and demonstrates to outsiders that participants are key partners in the work being done. Giving participants the experience of "having a voice" is key in supporting their sense of

autonomy [5, p.139]. Within the myPAL project, we achieved this by recording video testimonials of participants' experiences and presenting alongside them in project meetings and conferences. Other teams might choose to do this by focussing on participant experiences in promotional materials, communications or research outputs, or even involving participants in their creation.

This sense of ownership supports a participant's sense of autonomy by underlining to them that they are an active agent in this process who has the ability to exercise real influence [5]. Our participants did indeed report feeling a sense of ownership over their contributions, with many making comments such as, "I feel really invested in it and I would really like to know what comes of it" and, "I feel I've actually contributed quite a lot as a student ... that's quite rewarding to have, as a student, knowing that the app is going to include things that I and the majority of the other students would like" [10, p.1]. In addition, the high rate at which participants chose to return for subsequent sessions speaks to this sense of ownership. While it is not possible to directly correlate autonomy with a sense of ownership, our experiences certainly echo the effects that SDT describes about the positive consequences of an autonomy-supportive environment on participant involvement.

## **2.2 Competence**

The second fundamental psychological need in SDT is competence. Competence refers to an experience of one's behaviour as being "effectively enacted" [5, p.135]. This means that a person feels as though they are able to meet a challenge that they have been set [7]. People are more likely to stick at activities they feel good at [7], a fact that is clearly key for a process such as co-design that aims to engage users over a period of time. In order to facilitate a sense of competence, activities must also be challenging enough to allow people to test themselves and expand their capabilities. In addition, people must be given the tools they need to complete an activity, as well as effective feedback on their progress that "downplays evaluation and emphasizes [participants'] effectance" [5, p.139]. Participants in co-design sessions have many chances to receive feedback from the group - each new idea is presented and then discussed by the team and either taken forward or not. This feedback should be received in real-time in a supportive environment where the importance of experimentation is emphasised throughout and 'mistakes' are not chastised and ideas not graded. It is also important to thoroughly explain what is required of participants during the co-design session and provide them with the tools they need to complete each task. For example, in our own work co-designing visualisations, we provided participants with a blank collection of common visualisation types on laminated A3 paper to support them in designing if plain paper alone was too intimidating [10]. Future co-design projects may find it helpful to think about their desired outputs and all the barriers that might stand in the way of participants creating those outputs. These could be factors such as a lack of confidence, time, resources or knowledge.

The team can then consider what kinds of competency supports might be put in place to counteract these factors.

Researchers want to generate as many new ideas as possible in a co-design workshop and so it is key that participants feel supported in making an active contribution. Within the myPAL project, we found that participants often began sessions by warning researchers that they were not creative and may not be able to contribute [10]. However, almost without exception, once the right supports were in place, participants engaged with the process and showed themselves as not only capable of generating new ideas but also adept at shaping the visual representations of these ideas. Not only does this result in more useful ideas, but it also leaves participants with a greater feeling of competence. There is a risk, however, that the fear expressed by participants at the beginning of sessions that they are not creative enough to contribute may lead many potential participants not to enrol in co-design in the first place. This highlights the need for recruitment materials to emphasise that not only are no design skills needed in order to take part, but also that potential participants already possess valuable design expertise by virtue of their experience in working in the area where the tool will be used.

Designers can also bolster a sense of participant competence by incorporating their ideas into the solution being developed - if members of the co-design team can see their ideas being realised, it gives them a sense that their contribution was important to the project. In this way, users can feel that they are “respected for their knowledge” and valued as co-creators in the project [11, p.1]. Within a co-design methodology, the researcher supports the user to creatively develop the project, not the other way around. As mentioned above, within the myPAL project, participants’ ideas were preserved as wholly as possible within prototypes. This had the effect of not only capturing the innovative solutions proposed by participants, but also evidencing the fact that the chosen solutions were user-driven [10].

In addition to incorporating ideas into the solution itself, the JISC, a UK not-for-profit digital resource and technology research company, have created a Co-design Playbook that encourages researchers to publicise participant input in reports, presentations and promotional materials to reflect the importance of their perspective and to attempt to persuade other users to participate [4]. This could involve not only using quotes and testimonials from participants in recruitment materials but actually asking users to co-design research materials that would appeal to them. This is all useful not only in the ways that it helps to recruit further participants, but also in reinforcing participants’ sense of competence in their contributions.

### 2.3 Relatedness

Human beings first experience the need for relatedness in infancy. The level and quality of their attachment to a caregiver influences the degree to which children exhibit both confidence and exploratory behaviour [7]. Babies' worlds are shaped by their sense of belonging, or, relatedness, with others. In order for optimal levels of wellbeing to occur, they must feel that they are cared for and supported. In SDT, relatedness, in addition to autonomy and competence, must be in place for a person to thrive in a given environment. A sense of relatedness can be cultivated when a person feels that others in their group value, like and respect them [5]. Persons who feel disconnected from and unvalued by group members and people in a position of authority are more likely to "move away from internalization and thus respond only to external contingencies and controls" [5, p.140]. Those who do experience a sense of relatedness are more likely to experience a more intrinsic level of motivation for the tasks associated with a particular environment [5]. This means that a person will experience greater levels of wellbeing when they perform those tasks and that they are more likely to actively seek them out. This has massive implications for the co-design process, in which we aim to cultivate high levels of participant engagement and wellbeing. As such, co-design researchers need to be particularly cognisant of the ways they relate to participants, creating a warm, relaxed atmosphere where participants feel that their views are important and their contributions are valued. During myPAL co-design sessions, we also attempted to create a relaxed atmosphere by speaking informally, playing music and games and providing refreshments to participants.

One of the fundamental concepts in co-design is that users are not objects of study but essential members of the design team. This principle is underlined by facilitators not being removed, impartial observers but actively getting involved and expressing their opinions on new ideas as they emerge. Co-design sessions are designed to feel more like team meetings than research experiments. If settings that are more controlling result in participants losing initiative and becoming less able to process creatively [7], co-design workshops are intended to be the antithesis of this. In addition, co-design methodology also places an emphasis on understanding and "acknowledging [users'] feelings" [5, p.141] in relation to the proposed solution being created. In our work on the myPAL project, we spent a great deal of the first phase of co-design trying to understand as thoroughly as possible the feelings and issues that students experience on work placements [10]. By devoting a large amount of time at the beginning of the process to deepening our knowledge of the contexts in which our application would be used, we gained a useful understanding of the needs our solution needed to meet. When designing potential visualisations, we discussed how participants might feel when using the application and how it might be used in a way that would help reduce their stress levels. In addition, these conversations supported participants' sense of relatedness by demonstrating to them that we cared deeply about the issues they face. As a consequence, we sent a clear message that we were

keen to listen to what they had to say and to build any potential solutions around their needs.

As touched on above, relatedness is necessary for enabling exploratory and experimental behaviour [7]. As a result, it is clearly much-needed in a co-design session, where participants are explicitly told that they are in a place of experimentation. The activities that participants are expected to undertake in a co-design session are often new to them and perhaps very different from tasks they usually complete. For example, in our work on myPAL we tasked clinicians, medical students and academics with not only coming up with new ideas for data visualisations but physically drawing them out on paper [10]. These skills were new to our participants and many of them initially expressed trepidation when the task was explained to them. If they had not felt able to stretch themselves and step out of their comfort zones, we would not have been able to collect the volume or quality of data we did. As a result, it is key that the co-design workshop is an environment that supports relatedness. In doing so, we can support participants in demonstrating the experimental, creative behaviours needed during a co-design session.

### **3 Conclusion**

Self-determination theory posits that humans are intrinsically motivated to “play, explore, and engage in activities for the inherent fun, challenge, and excitement of doing so” [5, p.134]. The level of intrinsic motivation people feel is determined by the level of satisfaction of three basic psychological needs for autonomy, competence and relatedness. The co-design process is one situation in which these needs can be met to the benefit of all parties. The environment within which co-design takes place is important - the way users are treated and the tools and support they are given are key in enabling all parties to engage creatively with a given problem. SDT demonstrates to us that, if their basic psychological needs for autonomy, competence and relatedness are met, participants often experience the motivation to contribute to the co-design process, even when working outside of their comfort zone. This higher level of volition leads to participants demonstrating greater levels of creative engagement, enhanced wellness while participating and placing a higher value on the solution they are helping to design.

The motivation users feel to be involved in co-design is evidenced by their willingness to make a creative contribution during sessions and their desire to return to undertake further co-design sessions. In addition, participants involved in co-design feel a sense of ownership over the contributions they make to the co-design process. They are proud of the results of their work and they feel responsible for the impact they have made. The co-design methodology gives participants the tools to express themselves creatively and to feel that they have been listened to and understood. This results in participants feeling that they are a part of the design team and provides them



with the right environment in which to take control of things they had previously only been able to passively consume.

As set out above, the marks of a successful co-design process could be considered both as getting strong, meaningful engagement from participants during the design phase and creating solutions that meet users' needs. It is not yet possible to assess our co-design work on myPAL by the latter parameter, as the developments made during these phases of co-design are still being implemented. If however we evaluate the co-design process through the lens of user engagement, the myPAL case study is one example of how the factors laid out in self-determination theory can be utilised to motivate participants to not only get involved but to excel. It is our hope that the experience we gained in running these sessions may prove useful to other designers and researchers intending to use a co-design methodology.

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