'This Is Your Life!'

The Design of a Positive Psychology Intervention Using Metaphor to Motivate

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Abstract. 'This Is Your Life' is a training aimed at personal growth, or 'flourishing', and is based on the science of positive psychology. The objective of this project was to create a design for a digital version of a book with theory and exercises about positive psychology. The target group for the digital version were primary school teachers. A user-centered design approach was used together with persuasive and gameful design frameworks. More specifically, a metaphorical design was used to motivate the target group to start using the training and to continue using and complete the training. Several metaphors were explored and tested with the target group. Finally, a working prototype of the digital training was developed and tested by the target user group. From this final test we found that the chosen metaphorical design indeed motivated people to (1) start working on the training and (2) continue working on the training.

Keywords: persuasion, positive psychology, motivation, adherence, design.

1   Introduction

Positive psychology is the study of the positive functioning and resilience of individuals. Central to this is the research on the influence of psychological flexibility, positive emotions, finding and using personal talents, optimism and hope, compassion, values and goals and positive relationships on the well-being of human beings. The premise is that enhancing these capabilities leads to a better psychological health: a greater capacity to lead a pleasant, successful, social and meaningful life. This can also be named optimal functioning or 'flourishing' (see e.g., Lyubomirsky, 2008; Seligman & Csikszentmihalyi, 2000). A new positive psychology intervention (a training or therapy that participants can execute mostly independently) was recently developed by Ernst Bohlmeijer to improve the 'flourishing' of teachers in primary education (Bohlmeijer & Hulsbergen, 2013).

The content of positive psychology interventions is mostly focused on active participation of the user. The general structure for positive psychology interventions

is a series of themes with different exercises, which aim to teach positive psychology principles and offer guidelines to use them practically in everyday life. These exercises can be divided in at least two major groups: reflective exercises and activity based exercises. Reflective exercises generally contain questions which facilitate a process of self-inquiry by the user. For example an intervention can contain exercises in which the intervention user investigates his or her life to discover what his or her strengths and talents are. These exercises are mostly constructed in multiple sub-questions, which guide the user through the process of searching and discovering.

The other type of exercises are based on activities to which the user should dedicate at least few minutes up to hours per day, week or month. In many interventions the importance of repetition is stressed, to receive the full benefits of the exercise(s). The importance of repetition and of active participation in order for the intervention to be effective illustrates that adherence is an important topic when it comes to this type of interventions. This is even more true for a digital interventions, which is the topic of this project. Adherence or actually the lack thereof, is one of the major challenges when it comes to digital interventions. Non-adherence is defined as 'the fact that not all participants use or keep using the intervention in the desired way'. The problem with non-adherence is that participants may not receive the full benefits of an intervention, or worse, no benefit at all (S. M. Kelders et al., 2012). Therefore, it is of utmost importance for digital interventions that they are motivating to use.

In the field of persuasive technology, motivating techniques have been explored by a variety of researchers. For example, Ham & Midden (2010) have argued that providing feedback through ambient light instead of through numbers could be experienced as more motivating because less cognitive effort is needed. In the field of gamification and serious games, it has been argued that a diverse range of gaming elements could have a motivational effect (Deterding et al., 2011). To some extent, the effect of the use of game elements in innovative products within the (mental) health domain has been shown in case studies (see e.g., Consolvo et al., 2008; Visch et al., 2011). Merry et al found positive effects on adherence with the use of a serious game for adolescents seeking help for depression (Merry et al., 2012). However, empirical experimental research on the motivational effects of specific game elements is often lacking in such case studies. In this paper, we would like to present a case-study that illustrates the motivating effect of using metaphors in the design of online interventions.

The demonstration project that is the topic of this paper was the individual graduation project of the 3rd author at the Faculty of Engineering (master in Industrial Design Engineering) at the University of Twente. The project demonstrates a digital intervention for primary school teachers based on positive psychology. The intervention was designed using persuasive elements and gaming elements. In particular, the intervention makes use of metaphor to motivate. We will describe the user centered design process of the intervention and an evaluation of metaphor as a motivational element with end users based on a first-encounter trial.

2   Using Metaphor to Motivate

One of the key challenges in designing web-based applications is how to give shape in words and visuals to challenges, goals, and feedback provided during interaction. In many traditional applications, emphasis is on concrete textual input (i.e., instructions or numbers signifying scores or tasks left to accomplish) or concrete images (e.g., desktop like wallpapers or avatars). However, in addition to such concrete elements, other design techniques, that are relatively new to the field of online interventions, could improve the experience of using such an intervention. Making use of metaphors is one of those techniques.

Lakoff and Johnson (1980) describe the essence of metaphor as understanding and experiencing one kind of thing (target) in terms of another (source). In her thesis, Nazli Cila (2013) gives an overview of the use of metaphor in design and of how designers communicate with users of products through metaphors. She for example describes that designers can use metaphors as a means to convey meaning in a product. In her definition, a product metaphor is "Any kind of product that is shaped to reference the physical properties (e.g., form, sound, movement, smell, and so on) of another distinct entity for particular expressive purposes." As such, any property of one entity (the source) that is mapped on a design (the target) can be seen as a product metaphor. Indeed, Ludden et al (2012) have shown that product designers can create products incorporating metaphors that people understand by making mind maps that show common associations from source to target. In interface design, metaphors have been used frequently to make items of the interface easier to understand and use. Think for example of the metaphor of the desktop. Since this metaphor was introduced, people have been able to find things on their monitor much as they were used to finding items on their desk. Other examples are the directory (folder), looking like a physical folder and the file, looking like a piece of paper with a folded corner.

The examples above illustrate the use of very simple, direct metaphors. A 'deeper' metaphor, a metaphor for which the distance between target and source is further (implying that the relationship between the two is less easy to see) could also facilitate attribution of the meaning of the source onto the target. This aspect of metaphors could be used to transfer a motivating element from a source onto a target (the design). To illustrate how this works, we will use Figure 1. In this figure, an illustration is presented that describes how the online intervention 'Superbetter' works. Superbetter is an intervention that, much like the intervention that this project describes, is set up to increase flourishing in people's lives; allow them to be a 'superbetter' version of themselves. In the image in figure 1, progress towards end-goals is visualized in terms of a steep road (and hence, not in terms of meaningless numbers or textual elements). In daily life, we commonly talk about tasks we undertake in terms of progress along a path ('I'm almost there', 'We're making progress', and 'I was sidetracked for a while'). Therefore, the metaphor of the steep road makes intuitive sense. When (as in 'Superbetter') coupled to the notion of going upwards and reaching the top (e.g., 'Rising to the occasion', 'I reached the top'), an element of prideful achievement is added upon successful completion. Finally, obstacles are presented along the way such as a bridge to cross and hurdles to overcome, further adding elements of playful challenge and hence as an opportunity for mastery and gaining of self-confidence.

Fig. 1. Illustration describing the online intervention 'Superbetter

Taken together, this suggest that employing metaphors in web-based applications may not just be used for fun or to ensure a usable interface, but that they may actually be used to communicate value and meaning to a user and may contribute to elicitation of positive affect during interaction. As such, making use of a metaphor can be seen as a persuasive and motivational element in an intervention.

3   User Centered Design of a Digital Intervention

The design case discussed here was a re-design of a web-based intervention based on a book training (S.M. Kelders et al., 2013). The training from the book 'This is your life' was adapted for primary school teaching staff into six chapters with different themes, containing both exercises and background information, all on paper. The re-design discussed here was aimed at digitizing the training for primary school teaching staff. The design of the digital intervention was carried out in a user-centered design manner (see e.g., Gould & Lewis, 1985), i.e., in close interaction with the proposed target group. With this aim, two interactive focus group sessions with representatives of the target group were organized.

Next to their interaction with the user group, the designers of the interactive part of the intervention worked in close collaboration with the psychologists who designed the content of the intervention.

3.1   First Focus Group Session and Design of First Concepts

In the first focus group session with the target group, both designers and psychologists participated. Next to this, teachers from several schools were present (n = 8 age 25-45.) This first session was focused on the target groups previous experience with the paper version of the intervention and on their daily habits and use of technology.

From the first focus group session, we found that teachers did not use some of the exercises regularly because they could not motivate themselves to do so. Teachers claimed that more reminders for exercises could help them to make doing the exercises a routine behavior. It was also mentioned that audio or video instructions (more interactivity) would be beneficial. Another finding was that there is a difference between younger teachers and older teachers with respect to their use of technology and willingness to adopt trainings or interventions such as 'This is your life'. Therefore, it was decided to direct the digital intervention at green schools (schools with teachers with an average age of 30).

After this focus group, the project team (of designers and psychologists) decided that using metaphors in the design of the concepts of the digital intervention could be a way to motivate teachers to make the intervention easier to understand and more fun to use. Three concept directions were developed in which metaphors were used on different levels. Figure 2, 3, and 4   show the three concepts; in each of these figures, an overview screen of the training (image on the left) as well as a view of a chapter / lesson (image on the right) can be seen. The first concept (Figure 2) uses a 'library' as a metaphor for the training. In this concept, 'opening a book in a library' is used as a metaphor for opening a new chapter of the training. The lesson view looks like a book while still holding reference to the library. This can be seen as a very direct, almost literal metaphor: target (the online training with different chapters) and source (the library) are from the same domain, it is very easy to see the relationship between the two.

Fig. 2. Concept using 'library' as a metaphor

The second concept (see Figure 3) uses a tree as a metaphor for the training. For this metaphor, the distance from target to source is larger; the relationship between a tree and a training is less easy to understand. Here, the metaphor of 'picking apples from a tree' is used for the concept of using different lessons (chapters) from the training. With this metaphor, the *meaning* and motivating element of picking apples as something that is beneficial for someone is also visualized by the basket (the more apples I have collected in my basket, the better). This might motivate users of this concept to open the different chapters of the training and perform the exercises in order to fill their basket.

Fig. 3. Concept using 'tree' as a metaphor

The last concept (Figure 4) shows the intervention presented as a journey on a map. Here, the concept of a journey and the 'discovery' of different places on a map along the way is again used to transfer the motivating aspect of a journey of 'wanting to discover new things' and 'wanting to complete a journey'. Again, this is an example of a 'deeper' metaphor; target and source are not from the same domain. However, in this case, the relationship between target and source may still be quite easy to understand because of the conventionality of the metaphor. The intervention is about improving people's lives and it is not uncommon to look upon life as a journey. In fact, in English, there are many words and phrases connected to life that use the metaphor of a journey. Someone might for example say "After university I was *at a crossroads*, and I didn't know *which way to go*." Or "You have to *move on* and forget about what has happened."

Fig. 4. Concept using 'journey' as a metaphor

3.2   Second Focus Group Session; Evaluation and Co-creation

The three concepts as presented in Figure 2, 3, and 4 were used in a second focus group. In this focus group, potential end users of the concept (N=5, ages between 25-35) offered feedback on the concepts and they gave suggestions for improvements. To facilitate this, several co-creation exercises were used (Stickdorn & Schneider, 2010).

The participants were handed a booklet of A3 posters with the concepts and separate elements that required feedback. The participants were first allowed to browse through their booklet and explore what was there. Next, several elements of the concepts were systematically reviewed. Each concept was marked with several points of

interests (POI) which would serve as a guide for the evaluation. Each POI was introduced with some information what it resembled and what it would do in a live interface. After that, the participants were asked to stick a post-it to the corresponding POI number with their comments for that POI. The participants were encouraged to write down anything that would come to mind. At some of the POI's a short discussion sparked and participants generated input such as possible improvements. The discussions were moderated by the designer to stay within time limits and after a few minutes participants were asked to write down all their input on the discussed element, without forcing a group decision on the discussed ideas or improvements. After all POI's had been discussed, participants were encouraged to clearly mark their favorite concept. Finally, participants created a collage of their ideal concept. They were allowed to cut and paste anything from the concept booklet or to draw their own ideas if they so desired. The last A3 poster (of the A3 booklet) showed a template they could use.

From this focus group, there was a clear winner amongst the concepts. All participants listed the concept that used the metaphor of a journey on a map as their favorite. One of the participants elaborated that it would feel like a journey to make yourself happy, which he imagined to fit the training perfectly. The other participants agreed and gave similar comments. This implies that the participants of the focus group recognized and understood the metaphor of the journey that was presented in this concept very well. Next to this, gaming elements that were represented in this and other concepts were recognized and appreciated. Further, the colorfulness of the journey concept was found to be most closely related to the overarching subject of the training (positive psychology). Furthermore, participants of the focus group mentioned that they would like to see as little text as possible and a clear interface with subtle elements that give insights in what is coming next or what is left for them to do.

3.3   Final Design

Because the results of the focus group clearly indicated that the target group showed a preference for the concept of the intervention presented as a journey on a map, this concept was further developed into a working prototype.

The main storyline for the final design is that of the user following a journey towards a flourishing life, guided by a Professor. Two screens (the home or overview screen and a view of a lesson/chapter) of the final working prototype are presented in Figure 5 and 6. The journey leads through eight locations (chapters) where knowledge (lessons) can be found to teach the user the 'secrets' (theory) to flourishing. In the final design, the typical terminology from trainings or school-like activities (i.e. lessons, exercises, chapters, etc.) was changed into terminology that was more relevant to the metaphor of the journey that was used. For instance: 'chapters' are 'locations' on the map and each location has 'challenges' which are the 'exercises' of the training. When a user completes the challenges for a specific location, he or she can get the 'key' to a next location. Locations also have names that are related to the 'life is a journey' metaphor, such as 'The island of broken dreams' and 'The river of flow'. The image at the top of the screen with the puzzle icons shows a user's progress within the current location.
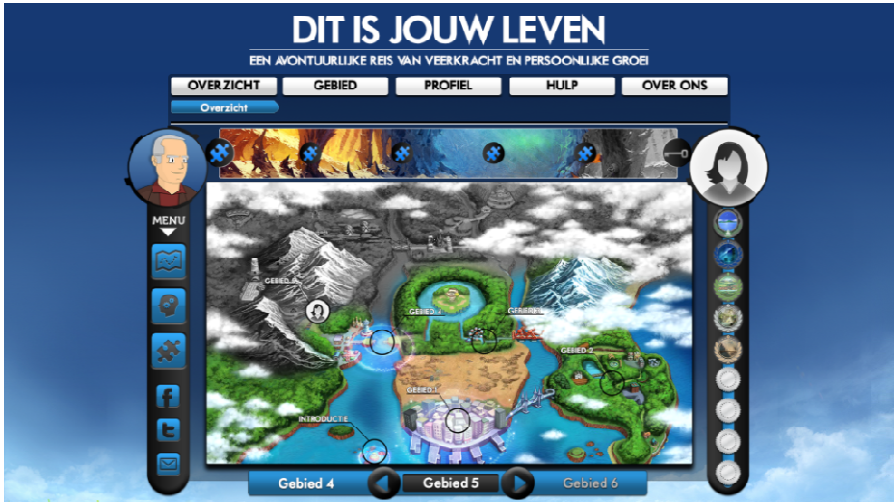
Fig. 5. The final prototype – overview map

Fig. 6. The final prototype – lesson view

4   User Test with Prototype

In order to test and evaluate the final prototype, individual test sessions with primary school teachers (n=13, 3 male, mean age=38) were organized. The test was designed to measure both the ability of the intervention to motivate as well as several usability factors. Next to this, we collected feedback on the visualizations, the training structure and general remarks. For this paper, we will report on the questions that measured the ability of the design to motivate only.

4.1   Method

The sessions were structured in two parts: a pre-evaluation and post-evaluation.[1] Sitting in front of a computer, the participant would first look at the training website. The participant was asked a set of pre-evaluation questions by the researcher. These questions were about their first impressions on the motivational factor of the training (e.g., 'Can you tell to what extent the design of the website motivates you to start with the training, 1 being completely unmotivated and 9 being completely motivated?' and 'Can you tell to what extent the design of the website excites you, on a similar scale as the previous question?')

Next, the participant was asked to complete the prototype of the training. This took about 10 minutes. The introduction core exercise, which was to read the introduction theory, was completed. After that, a key was presented that unlocked location two (The City of Positive Emotions). In this location participants could again read the theory and complete the core exercise. After finishing the training in location two the prototype ended and a next set of questions was asked through a digital form. Questions that tested the motivational aspect of the training were the following: 'After this introduction I would like to continue with the full   training' , 'I am motivated to continue the training', 'The design of the training is challenging' and 'The design of the training is playful.'

During the entire session observations were made of (unexpected) user behavior, for example, the preferred usage of navigation elements (i.e. top, side or bottom navigation),   exploration of menus and content and moments during the usage in which the participants required help (i.e. when they asked the observer for explanations).

4.2   Results

To the question about their first impression of the website, all participants reacted that the website looked good and professional. Also, they reported that their curiosity was sparked or that they were excited about discovering the landscape of the map overview. Eight participants found the interface unclear or cluttered on first experiencing it. Responses to the question that asked participants to rate to what extent the design of the website motivated them showed that generally, the design motivated participants to a reasonable extent (m = 7.3, sd = 0.6). Comments were that the first impression made them curious, and that it invited or challenged them to continue on the supposed 'journey' or 'adventure'. Four participants found the website playful or 'like a game' and two participants explicitly mentioned they did not fancy games. Respondents reported to be excited about the design of the website (m = 7.5, sd = 1.1). Comments resembled those for the first two questions: the site looks good, and was perceived as a professional website. Some participants repeated that they would like some more color or a different style altogether.

Responses to questions after finishing the prototype showed similar results; Participants reported that they would like to continue the training after having finished the

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[1] Before the start of the test, participants were informed of the purpose of the test and signed a consent form.

prototype (m = 6.9, sd = 1.2) and that the training motivated them to continue (m = 6.2, sd = 2.2), the design of the training was found challenging (m = 7.3, sd = 1.0) and playful (m = 7.2, sd = 1.0).

5   Discussion

From the user evaluation of the prototype we found that the final design of the intervention that was the topic of this study was seen as motivating and stimulating by users. Moreover, the metaphorical element of the design (the presentation of the intervention as a journey on a map) was seen as motivating. However, in this study we only let users use a prototype of the intervention for a short time. To determine whether (the motivating aspect of) this design will indeed lead to better adherence to the intervention we are planning a Randomized Controlled Trial that will compare effects on adherence of this design to that of the (more traditional) design of 'Voluit Leven' online.

Participants in the second focus group showed a clear preference for the concept that used a journey on a map as a metaphor. In our explanation of the concepts, we have stated that this is an example of a deep metaphor that is conventional. We would like to argue that these elements together (the depth of the metaphor and its conventionality) have led to this choice. While a deeper metaphor is often found more interesting (Cila, 2012), a deep metaphor that people do not understand will never work. In this case, where a (training about) life is seen as a journey, the metaphor will be easy to understand because of its conventionality. Therefore, the metaphor works and is still interesting, it fits the purpose (this training about life) very well.

In this paper, our main argument is on metaphor working as a motivational element in the design of an online intervention. As can been seen in Figure 5 and 6, the eventual design of this training used other motivating elements (mostly inspired on gaming) as well. For example, during the training, pieces of a puzzle can be 'earned' to reach new locations (levels). Also, completing the exercises in a particular area will result in that area being presented as more colorful. Eventually, all these elements will work together to motivate a user of such an intervention. Using too many motivating elements would not be an advisable strategy, rather, a sensible and balanced selection has to be made. Therefore, further research into the capacities to motivate that different elements have in separation and in combination is in order.

As a motivating element, it was also mentioned by participants that a walkthrough at the start of the training could very well serve for setting goals. Indeed, if participants know from the start what the map will look like after they have finished all elements of the training, this may motivate them to reach this goal.

The differences in scores on motivation before and after completing the prototype were small; however it is worth noticing that the score for motivation seems to be somewhat lower in the post-evaluation questions. An explanation for this may be the interest in this type of intervention in itself, rather than the design of the training. Upon first viewing the design of the intervention, respondents were not aware of the aim of the training. Whereas after completing the prototype they were. During the

post-evaluation some of the participants mentioned they actually did not have interest in the subject of the training, although if they would have had an interest in it, they would be motivated by the design. Remarks of respondents after the individual sessions seem to reveal that especially the male participants (relatively few men participated in our evaluation sessions) lack affinity with the theme of the training. This concurs with findings that most web-based interventions are mainly used by women (S. M. Kelders et al., 2011). Apparently, the appealing design of this intervention did not overcome the lack of interest in the subject of the training.

Making use of metaphors is not necessarily a gamification technique. In the case study presented here, we have used both a metaphor and gamification elements. Recently, there has been some debate about using gamification because elements of gaming would only extrinsically motivate people and are in many cases not meaningfully designed (Gartner, 2012). Using metaphors to motivate may be a good way to create meaningful design, resulting in enduring involvement with the intervention. However, controlled studies comparing metaphor based interventions with standard interventions and/or with gamified interventions are necessary to support this claim.

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