The Role of Narrative Transportation Experience in Design Communication

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Abstract. User experience design requires communication to share design information and to integrate specialised knowledge to optimise design performance. Personal experience during communication process will influence individual participation, the output of communication and design performance. Defined by absorption into stories, narrative transportation will lead changes in beliefs and attitudes, which is potentially beneficial to design communication. This paper explores the role of narrative transportation in the communication of user experience design through literature review and experiments. The role of narrative transportation is positive proved by the increased effectiveness of design communication. It also provides a support of the importance to use storytelling in user experience design and implies the necessity of tools supporting storytelling.

Keywords: Narrative transportation · User experience · Design communication · Storytelling

1 Introduction

As Hassenzahl proposed that user experience is dynamic, context-dependent, subjective [1], the individual experience during communication will influence their participation and the performance of communication. User experience design usually requires designers and other stakeholders with various backgrounds to communicate together to share information, discuss design ideas and concepts and make decisions, especially in a large and complex project. Communication is the transmission of information [2]. It is a dynamic process in which people, both information senders and receivers [3], consciously and unconsciously interact with and affects by others through different channels [4]. During communication, information is transmitted, but it is not necessarily received or understood [2]. Although most of the design communication is positive, it frequently happens that there are arguments or disagreements from other stakeholders because of limited knowledge in related fields and lack of full understanding and empathy. It results in refusal of giving opportunities to the new ideas and frustrations for designers as well. Narrative, known as stories or testimonials, are a basic model of human interaction [5]. Narrative transportation, defined as absorption into a story [6] and proposed as a

powerful persuasive means [7], can lead to emotional and cognitive changes. It has been mostly applied in psychological assessment but less practiced in design research. How to promote design communication is such an important problem as it requires hold an open mind, which means people should accordingly adjust individual attitudes and beliefs. It is easy in principle but hard in practice. This research proposed a discussion of the role of narrative transportation experience in design communication. In this research, theories of narrative transportation are introduced, experiments for evaluation of both narrative transportation and effectiveness of communication are conducted. It indicates that narrative transported people participate actively in communication, and efficiency of communication increased by less time on communication meetings, practical decision-making and reduced negative cognitive response by self-reported transportation. Since narrative transportation via stories does indicate not only mental imagery, but also physical medium as stories in the transportation, storytelling is theoretically supported in user experience design.

2   Related Theories Review

2.1   Narrative Transportation Theory

Narratives have been assumed and proved to be effective for persuasion in fields like psychology and marketing. Stories are one of the narratives, with a plot consisting of beginning, middle and end, and provides people with a simple way to share information and communication. Narrative transportation is proposed as absorption into a story and an integrated melding of attention, imagery, and feeling by Green and Brock [6]. It can provide people with a vivid experience through narrative transportation via stories. Transported people, who are absorbed into or get lost in a story [6, 15] can image the story, share the emotions presented in the story and easily focus on the story, thus become prone to be engaged in the activities.

Since transportation is a convergent process during which mental activities such as emotion, attention and imagery focus on events occurring in the narrative [6], the Transportation-Imagery Model (TIM) proposed by Green and Brock [6, 9] indicated that the transported people are subjectively distance from reality [10], provoked with strong emotions and motivation, and exhibit greater change in attitude and belief in response to stories [9]. It can foster emotional and empathetic connections with story. Then beliefs and attitudes can be affected by vivid imagery which makes narratives seem like a real experience.

Narrative Transportability Scale including 11 universal items and a varying number of items addressing the experience of the character in a specific story, was developed to measure differences in individual state of being transported into the narrative world [7]. The Transportation Scale-Short Form (TS-SF) was proposed for practice by Appel et al. [10] because the former one turns out to be too long.

Narratives are a promising method to create a shared understanding within design group/team, and the process of narrative transportation can help people to image what will be like of a design idea and make a reference to it. Then it is highly possible to promote communication during design process.

2.2   Communication in User Experience Design

Communication is a system of transmitting information and interaction of personal beliefs. Communication is necessary because there are possible differences in cognition of information senders and receivers. Information can be transmitted through verbal forms, written words and visual images. Mind reading [11] which is necessary in communication to acquire information and knowledge about other people's beliefs and desires, is easy to achieve through transportation. Communication theory [12] has been studied in various disciplines for different purpose. In design, communication has been got more attention since design has changed from individual activities to collaboration, especially for a complex and large design project. Brilliant ideas, feedback, and suggestions need to be explained in a way that others can read, hear, understand and respond to. As Fig. 1 shows that in the communication of user experience design, it is a dynamic system including people, content, channels or mediums, cognitive process, mental mind etc. People can get to know unknown or new things and ideas during communication. Designers are likely to convey information about details such as functionality, form, shape, colour, technology, value, user needs and creativity etc. to other stakeholders. Meanwhile, others give feedback, advice, and arguments about all the aspects for design. Consultation, negotiation, evaluation, confirmation and decision-making are usually achieved during design communication. The effectiveness of design communication directly affects final decision-making and outputs of user experience design. Previous studies mostly focused on the results and patterns of design communication. Effectiveness of design communication has also been stressed. However, it is common to be addressed from the perspectives of communication methods, tools supporting, and from an organisational view, rarely be concerned of personal experience during communication.
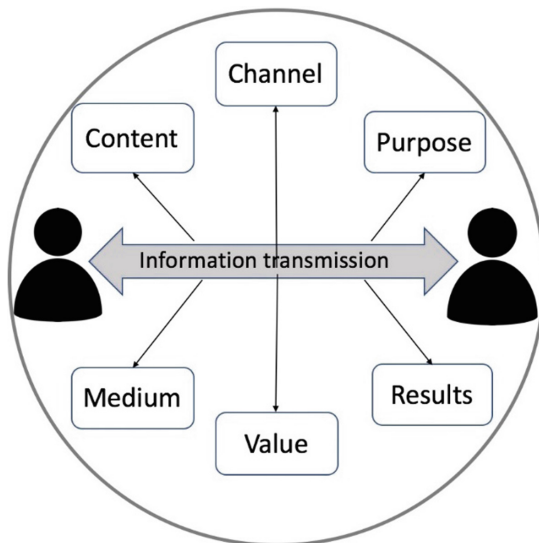

Fig. 1. Design communication

In design communication, empathy is another important aspect which can influence effectiveness. Empathy means seeing with the eyes of another [13]. It can promote communication by understanding or feeling what another person is experiencing. Empathy can be enhanced through narrative transportation because people experience emotional changes in transportation and easily to imagine and understand what the main character experience in the story. In design, empathy is possible promoted by narrative transportation via visual stories, because to visual something is to construct a visual image that resembles the visual experience you would undergo [13].

3 Studies

3.1 Study 1

Introduction. To determine whether people are transported into a narrative and the role of narrative transportation to design communication, an experiment of the evaluation was conducted. The context is designed as a workshop for the early design of user experience with people involved having a communication meeting. A design assignment is given with a written description. It simply describes the problem encountered by a master student, who is from east Asia and just begins his life in Netherlands. Due to the special rainy weather in Netherlands, he/she always has the problem for navigation when he is riding a bike outside. 20 university students from Industrial Design, Psychology, Computer Science as participants took the experiment. They were half-half divided into two groups with 3 small teams respectively. In each small group, 3–4 participants are mixed with different backgrounds. At least one design student is required in a team. All the groups have communication meetings separately in different places with the same design assignment. In order to simplify the research procedure, we try to keep balance in gender and age differences. Hypothesis 1 is that the effectiveness of design communication will be improved with participants' experience of narrative transportation.

Procedure. To get an insight of the differences, two big groups are required differently for comparison. Based on the same design assignment with the same introduction, there is no special requirement for group 1. Participants can collaborate with the design work in their normal styles. Verbal expression, sketches, images, slides are allowed to use freely. In group 2, storytelling is asked to use, no matter what kind of expression for the story. Narrative transportation means people get lost in a story, and it mostly a mental activity. It is required to try to come up with design solutions and no specified procedure to follow for both two groups. All the processes of communication are observed and recorded. All the participants finished the Transportation Scale Form and joined an interview for a deep insight of their feedback.

Adaptation of the Transportation Scale. Transportation Scale [8] referring to cognitive, emotional and imaginative aspects was used to measure narrative transportation (see Table 1). It includes 11 basic items added with 1 item specific to the character used in the design communication. This added one is not necessary if no character or no

Table 1. Transportation scale for measurement

General items	
1	While I was reading/seeing the narrative, I could easily picture the events in it taking place
2	While I was reading/seeing the narrative, activity going on in the room around me was on my mind
3	I could picture myself in the scene of the events described in the narrative
4	I was mentally involved in the narrative while reading it
5	After finishing the narrative, I found it easy to put it out of my mind
6	I wanted to learn how the narrative ended
7	The narrative affected me emotionally
8	I found myself thinking of ways the narrative could have turned out differently
9	I found my mind wandering while reading the narrative
10	The events in the narrative are relevant to my everyday life
11	The events in the narrative have changed my life
Item specific to the character in the story (if necessary)	
12	While reading/seeing the narrative I had a vivid image of XXX (the character's name)

story in their communication. The measurement is evaluated by a 7-point Likert scale ranging from 1 (not at all) to 7 (very much).

Analysis and Results. During the communication meetings, participants were organised to discuss the design assignment, express their ideas in various ways. In group 1, all the 3 teams communicated in conventional ways, such as verbal talking and discussion, visual sketches, mind-map drawing. 1 team also used persona and storyboard which are often used in user experience design. In group 2, storytelling is the requirement for communication. Storytelling here is different to simple storyboard with persona and scenario. It consists of a beginning, middle and end, and the plot development as well as a climax. Giving to limitations of visualization, it can be used in verbal language, written words and visual storyboard or images. For narrative transportation measurement, the means of each participant for the 11 items in the scale are analysed (see Fig. 2). 30% of the means is higher than the scale average state of point 4 in group 1, which indicates that the narrative transportation was not experienced a lot in this group. But small percentage does not mean that the other 70% participants did not experience transportation at all. Compared with the former one, 80% means are higher than the average 4 in group 2. We cannot conclude that how much narrative transportation was experienced by participants in group 2 only from the average numbers. However, the different data shows that it is possible to say it is easy to narrative transported because more people get narrative transportation with the help of storytelling. By SPSS analysis, gender and age have no significant influence to individual narrative transportation. For item 3 referring to cognition and 7 referring to emotion, there are significant differences (item 3: $p = 0.037 < \rho$, item 7: $p = 0.029 < \rho$). This means that participants in group 2 experienced changes in cognition and emotion significantly. It can also support the hypothesis that stories can promote narrative transportation by emotional changes.
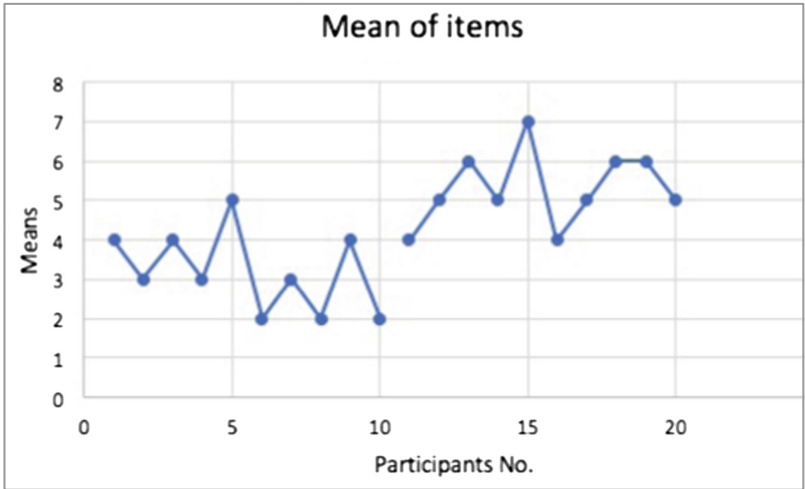
Fig. 2. Means of narrative transportation

As to the evaluation of the effectiveness of communication, data was collected from the following aspects: time for communication meeting, how many design solutions are proposed, whether to make a design decision. Meanwhile, a questionnaire based on literature of assessment of communication [4, 14], was developed to get the feedback of personal opinions. Questions cover the holistic evaluation of the communication and personal feelings in engagement and understanding. The results show that, on the whole, more design solutions were proposed in group 2 with less time spent (see Fig. 3). The workshop was designed to finish within 2 h. The time for communication is little differently in minutes. All the teams in group 2 got their final decision-making, and only one team in group 1 did not make decision. Analysis of the questionnaire indicates that there is no significant difference of personal engagement in the communication ($p = 0.867 > \rho$). However, the difference of personal understanding with

group	team	time spent on communication (hours)	number of design solutions	decision-making (Yes/No)
1	1	2.0	3	Yes
	2	1.67	2	Yes
	3	2.0	2	No
2	4	2.0	4	Yes
	5	1.67	3	Yes
	6	1.83	5	Yes

Fig. 3. Data for communication in each team

others is quite significant (p = 0.316 < ρ) and the same in holistic satisfaction of the whole communication (p = 0.348 < ρ). To some extent, this proves that the effectiveness of communication has been increased.

The data from recorded videos and interviews are translated literally and analysed. It is obvious that in group 2, nearly 80% of the participants reported that they changed their attitudes after constructing stories and they are prone to understand other team members' opinions and to engage themselves in the stories. It is consistent with the result of narrative transportation measurement by the scale, which means they had experienced narrative transportation. There are more interactions among the team members in group 2 by more talking, more eye contacts. A higher percentage of satisfaction of the communication is calculated in group 2 compared with group 1.

3.2 Study 2

Because narrative transportation has a direct relation with stories by its definition, stories are constructed and expressed mentally. Then transported people are influenced by the characters in stories to change their beliefs and attitudes. Studies for narrative transportation mostly try to explain it terms of internal cognition. How about the external medium for stories? The stories can be shown in written words and visual storyboard. In design, we proposed hypothesis 2: Visual storytelling can be used as stimuli to enhance the generation of narrative transportation. In this study, 10 students (6 male and 4 female) participated in two groups with 5 ones randomly distributed in each group. Given to visualization which may need some sketch skills, only industrial design students were recruited in this study. The same design topic used in study 1 was used as well. The difference is that written stories are required for communication in

Fig. 4. Visual storytelling by group 2

group 1, and visual stories in group 2. The Narrative Transportation Scale with a 7-point Likert scale is employed to measure individual transportation immediately after the end of the communication.

The results indicated there is no significant difference in the means of the 12 items ($p = 0.842 > \rho$) in Narrative Transportation Scale. However, all of the participants in group 2 using visual stories get higher points in all the 12 items, and they proposed more design solutions (shown in Fig. 4) both in hand sketches and image storyboard than group 1 within the same time. They also explained that it is easily to engage in the communication and experience empathy through constructing and expressing of the visual stories.

4   Discussion

For narrative transportation, more studies have been made in different fields but less practiced in design research. This paper proposes a research of its role in design communication with the aim to find alternative ways to promote design communication and design performance. However, there is still some space for further discussion.

4.1   Measurement of Narrative Transportation

In this research, Narrative Transportation Scale is used to measure individual narrative transportation according to recommendations from previous studies. However, narrative transportation is a process rather than a statement, we can limitedly get to know there are individual differences in the transportation with the different number assessing experience of each item in the scale. In study 1, we cannot conclude that there is no narrative transportation in teams of group 1 with lower points. The higher points only mean that it is possible for a person to be narrative transported easily. How long they transported and to what extent of their transportation to cannot be deduced only from the scale, which may affect the communication. What we can conclude from the measurement of narrative transportation is that easily transported people play positive role in design communication. But the extent of the positive role to communication cannot be concluded quantitatively.

4.2   Evaluation of Effectiveness of Design Communication

Since limited research of communication theories applied in design, there are no universal standards for evaluation of design communication. In this research, we try to combine the methods of related previous studies and the special characteristics of user experience design to formulate the evaluation for the effectiveness of design communication by recording time and numbers of design solutions and survey of personal feelings. However, the number of solutions has no direct correlation with communication effectiveness and the quality of proposed design solutions cannot be evaluated simply and quickly. All of these decrease the feasibility and reliability of the

evaluation. It is possible to conclude that the effectiveness of communication is influenced by easily transported people and the influence is positive.

4.3 Limitations in Both Two Studies

There are limitations in both two studies. There are no significant differences in some items in Narration Transportation Scale. This can be attributed to the limited number of participants, especially in study 2. The analysis of information from video records and interviews is plain to a certain degree and not enough to provide support for the hypothesises. Narrative transportation is a process which involves complicated mental activities. It is not enough to decide people experience transportation by their self-report neither by their body languages and behaviours.

4.4 Visual Storytelling

It is shown in study 2 that visual storytelling contributes to experience narrative transportation. Narrative transportation is essentially associated with story. Visual storytelling can promote construction of stories in mental processing, then promote narrative transportation. An interesting finding is that participants in study 2 visualize stories by hand-sketches and with the help of tools. Since not everyone involved in user experience design are skilled in sketch, it is necessary and valuable to explore tools supporting visual storytelling which can make storytelling fast and easily.

5 Conclusion

Transportation is a process into a narrative which involves cognitive and emotional investment. In this research, individual narrative transportation in design communication is studied to support the hypothesis that effectiveness of design communication can be improved through narrative transportation. The role of narrative transportation is positive and beneficial. Meanwhile, the visual storytelling in design communication shows its special benefits. It provides an alternative method to promote design communication by experiencing narrative transportation. It also gives us a research direction of tools supporting visual storytelling to promote narrative transportation.

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