Significance of Physical and Virtual Places – The Case of Teams Meetings

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Abstract. During the last years telemeetings have become an important communication channel. Participants can select the physical place in which they participate to meetings, and also the background image of their camera video, which is virtual place of the participant. This paper focuses on what effect the alternative places has on the concentration to the discussion topic.

The research method of this paper is autoethnography in academic context. Test uses consist on Microsoft Teams meeting in two alternative physical places, i.e., an office and leisure place, and in two alternative virtual places, i.e., the background images of the office and leisure places. The topics of discussion were work, i.e., writing a paper, and leisure, i.e., planning a trip. The test users evaluated and described their feelings after the telemeetings.

The result presents that both physical and virtual place matters. When the physical and virtual places are in line to the topic is discussion, it supports the concentration to the topic. Furthermore, when the physical and virtual places are in contradiction to the topic, it complicates the concentration to the topic.

Keywords: Physical place · Virtual place · Sense of place · Telemeeting · Microsoft Teams

1 Introduction

Due to Covid-19 pandemic, people have used to teleworked and participated to telemeetings with different computer-based tools. Instead of offices, people have been working from their homes. In small meetings all participants have cameras on and in bigger meetings at least the presenter has camera on. Different people use various background effects. That can be the actual background of their working place, but that can also be their university or office image, or something related to their hobbies.

The physical place matters. It has been recognized that situational variables are essential for explaining and understanding people's acts [1], since the place relates to experiences, memories, and emotional attachment [2]. Besides of place matters in general, it also matters in the case of virtual environment and products [3], the background image can be seen as a virtual place. The studies of place are opened more at the Sect. 2. This paper discusses what kind of the feelings the actual physical place and the images of other partner's physical places give to the participants.

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The research methodology of this paper is autoethnography. For achieving research data two researchers make alternative trials and analyze their own feelings of different places. The researchers have long experience of studying the effect of physical place within using computers-based tools. Their publications of this subject start from 2013 [3]. Besides of place studies, they have studied the feeling which virtual prototypes give to the users [e.g., 4, 5]. In this study the test users are in different physical places. The test uses have been done in offices and in leisure time places, e.g., in a boat and in garden. Furthermore, the background images varied between office picture and leisure time picture. The research methodology is outlined more deeply at the Sect. 3.

The results of this study outlines participants' places effect on the feeling of the meeting and focusing on the topic of discussion. Participants own physical place make an effect: It can support or complicate concentration to the topic of discussion. Besides, the other partner's virtual place – that is presented in the background image - can support or complicate concentration to the topic of discussion. The research results are opened more deeply at the Sect. 4 and discussed at the Sect. 5.

2 Studying Sense of Place

There is a long tradition of studying people's sense of place, which presents that the places are important to people. The assumption that physical place matters is acknowledged, as it has been recognized that situational variables are essential for explaining and understanding people's behavioral acts [1]. The place in which the person is situated is important, as it relates to experiences, memories, and emotional attachment [2]. These place-related memories, conceptions, interpretations, and feelings are referred to as place-identity [6].

However, the focus of the studies has been changed during decades. The traditional way to study the sense of place is to focus on the emigrants' feelings of a new place. This way focuses on the physical place and people's feelings about it [e.g., 7]. The same physical place connected tradition is followed by studies of tourism, place, and ICT. Although computers and the internet are added to the context, the idea is focusing on the actual physical place, the place to which tourists travel [e.g., 8].

However, the other end of studying the sense of place is to focus on the feeling of place in immersive virtual environment (VE). In this context it is used the concept of presence, which means that the user feels to being somewhere else than in the actual physical place. In the case of VE the place is virtual and the sense of (non-physical or imagined) place is created with computer system and immersive technological environment. In the VE studies is assumed that VE visitors immerse themselves into a computer-created world in VE so that the ambient physical world becomes irrelevant to them [2]. In those VE studies the physical place used to be a 3D VE laboratory, but nowadays head-mounted displays are an option for this.

The third way to study the sense of place is mixing the above two: how the physical place effects on the expectations users have on virtual images and how users interpret them. The authors of this paper have studied that by focusing on virtual furniture prototypes by presenting them at a VE laboratory and a furniture fair [3]. At the VE laboratory the virtual prototypes were shown at high-fidelity, but still users mainly focused

on the technology and its possible problems instead of virtual prototypes. The test use at the furniture fair utilized a low-fidelity VE technology, as the portable technology was needed. In the furniture fair the test users focused on the products, their features, and their possible development ideas. The study proves that the physical place effects on which issues the users focus on when observing virtual prototypes. The VE laboratory is a place of science and technology, so the users mainly focused on the technology, whereas a furniture fair is a place of new products and that is what the users focused on[3].

This study follows the idea that physical place matters for users' interpretations. Telemeetings give alternative possibilities for physical and virtual places. In that case the physical place is, where the participants are actually situated – as in an office, at a living room couch or in a garden, for example. Furthermore, the background effect of Microsoft Teams meeting, gives more alternatives. The background effect can be the actual background of the participants, but it can be changed to present something else, such as a picture of an office although the participant is somewhere else, like at a garden. This study focuses on how the changes of the physical and virtual place effect on the participants feelings during the meeting.

3 Research Methodology

The research method of this study is autoethnography. It is a method in which researchers' own experiments and notes of them are the main research material. It is a useful method in such cases which are hard to study with other research methods. Although autoethnography uses only one or few researchers own experiences, that is a useful method, as their feelings and interpretations are not only their private ones, but they also include the cultural shared assumption. They represent the understanding of the whole community [9].

Autoethnography is selected the method for this study as the research setting is hard to study with other methods. First, the issue that is analyzed is the feelings users have when using a telemeeting system. Feelings are very personal and sensitive issue and describing them to others is not easy. Second, for having relevant test use cases, there is needed persons who actually have co-operative working and leisure time activities so that alternative setups are possible to study.

The research method and its selection are described in the next sections. First is described the two researchers (they are called as test users) and their work. Second is described the alternative places which are used in this study. Third is described the trial uses. Fourth is described the analysis plan.

3.1 The Test Users

In selecting the test users an important issue was that there is two persons who are used to work together. That is important since in telemeetings the topic under discussion needs to be actual cooperative task. The test users, two researchers (called R1 and R2) have made studies and wrote papers together for at least 15 years. They have co-authored papers about virtual environments [see, e.g., 3–5, 10].

Besides of working together they have their own research areas. The field of researcher R1 is information systems science and she studies eCommerce [e.g., 11] and virtual environment in designing products [e.g., 12]. The field of researcher R2 is mechanical engineering. He studies fluid power technology, designing and manufacturing in addition to virtual reality [e.g., 13]. Furthermore, the researchers R1 and R2 are a married couple living together and traveling together. The basic information about them is presented at the Table 1.

Table 1. The researchers.

code	year of PhD	work title	unit	main research area	hobbies
R1	2002	University lecturer	Information technology	information systems	garden, traveling
R2	1992	Professor	Mechanical Engineering	design	boat, traveling

3.2 The Plan for Trial Uses

The theoretical background for this study is taken from Erfani's reconceptualing sense of place [14], which outlines the concept of sense of place by three elements: individual, community, and place. Individuals, on one hand, have their own emotions, beliefs and perceptions about their own home, neighborhood, city, and other places. On the other hand, individuals have social relations with other individuals, and they build socially constructed categories and shared view of places together. Sense of community means a sense of belonging to a particular area, social group, identity, emotional connection, and well-being. Because of globalization and technological innovation also non-place-based communities have been shaped. Despite of their advances, place is still a key element in shaping of our perceptions. Place is conceptualized as certain moments of social relations rather than only as areas with boundaries around. [14].

In the Teams meetings the study individuals are the test users R1 and R2. They participate to the test uses with their own life history including the earlier participations to telemeetings and research activities, their situated circumstances and feeling during the test uses. The discussion tasks consist of two topics. The discussion topic belongs either to the research work or to a leisure time. The work task is writing this conference paper, whereas the leisure time task is the planning a trip together.

Community includes both actual and normative community. The actual community is shaped by the people who are or could be present in the situation. The normative community is the assumptions and expectations which exist within the situation. In the case of the Teams meeting study, they are either other researchers or other people in leisure time activities.

The Teams meeting includes three dimensions: The physical and virtual place as well as topic of discussion. The physical place is where the test user is located. For achieving

variation among physical places, the alternatives are the office in which the test user normally works and a leisure time place. The leisure places are selected based on the test users' hobbies, so the test user R1 is located to a garden and the test user R2 is located to a boat. The virtual places are those which the discussion partner sees about others' location. They are what is presented as the background picture during the discussion. The virtual places are the pictures of the used physical places. However, they are alternated so that some meetings have the same physical and virtual place and correspondingly some meetings have the opposite places. Although the topic of discussion is either work- or leisure-related and it happens in academic context. The setup for test uses is outlined in the Table 2.

Table 2. The setup for test uses.

test	date	physical place	virtual place	topic of discussion
work-1	29.6.22	garden/boat	office	What kind of photos are need for the paper?
work-2	29.6.22	garden/boat	garden/boat	What will be told about us in the paper?
work-3	4.7. 22	office	office	What kind of evidence is the purpose to get?
work-4	4.7.22	office	garden/boat	What will be told about the places the paper?
trip-1	4.7.22	office	office	The possible accommodation in trip to Norway
trip-2	4.7.22	office	garden/boat	Attractions during the whole trip
trip-3	7.7.22	garden/boat	office	The hiking plan at Kilpisjärvi, Finland
trip-4	7.7.22	garden/boat	garden/boat	The hiking plan at the north Norway

Based on Erfani's reconceptualizing sense of place [14] an evaluation form was shaped. It has the following questions:

1. What were the circumstances of the meeting, e.g., the temperature?
2. What were the general feelings of the meeting?
3. What kind of place did the discussion belong?
4. What kind of a community did the discussion belong?
5. Evaluate how well did the topic of discussion and the place fit together. Give a number between –5 to + 5 and write some reasoning for this.

Both test users fulfill the form after every test uses resulting 16 forms for analysis.

3.3 The Places in Data Gathering

The test use includes both physical and virtual place. A physical place is the place where the users stay during a test use. A virtual place is the place, that is presented in the

background picture of the Teams meeting. The places are a work-related place, which is an office for both test users R1 and R2, and leisure-related place, which is a garden for R1 and a boat for R2.

The pictures of work-related places are presented in Fig. 1 and 2. Figure 1 presents the office space of R1. She works at her home office. She has been using it for writing papers also before COVID-19 time. Still, for her office background picture she uses a picture that is taken from her university office. Figure 2 presents the office space of R2. His office – both physical place and the background picture – are from his university office. In their offices both researchers have two screens. For this research purpose, it was decided that in the test uses only the single screen of laptop computer is used, however, in trip planning also the other screen for seeing maps was needs, as seen in Fig. 1. In all test uses R1 and R2 stay in a similar physical place, either in a work- or leisure-related place.

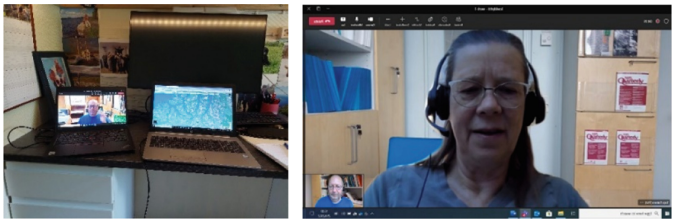

Fig. 1. The physical and virtual work-related place for the test user R1.

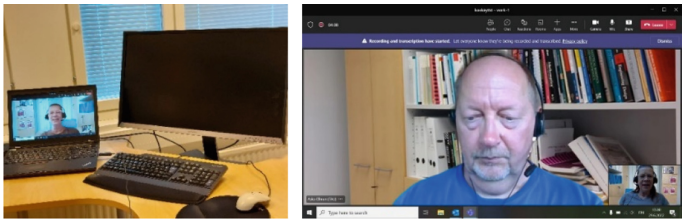

Fig. 2. The physical and virtual work-related place for the test user R2.

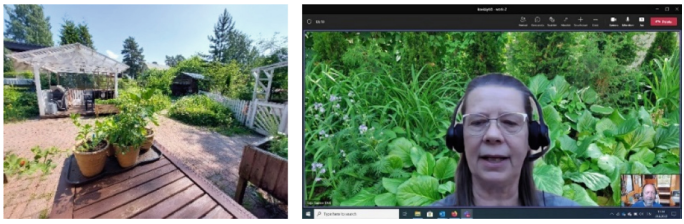

Fig. 3. The physical and virtual leisure-related place for the test user R1.

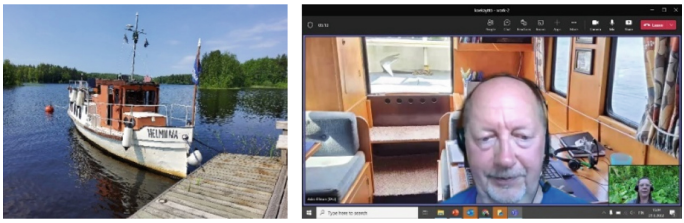

Fig. 4. The physical (boat place) and virtual leisure-related place for the test user R2.

Figure 3 presents the garden, which was the physical place for the test user R1 as a leisure-related place. She sits by the garden table. The leisure background picture is taken from the garden. That is also presented at Fig. 3. Figure 4 presents the leisure-related place of the test user R2. That is the boat by a lake. In the leisure meetings the test user R2 sits inside the boat. The leisure background picture is taken inside the boat.

3.4 The Plan for Data Analysis

There are three kinds of empirical research data for this study:

1. The forms, in which both test users have written their feelings after every test use. There are eight forms for both test users. Total number of forms is 16.
2. The videos of the discussions. All the discussions are recorded, so there are eight videos.
3. The photos of the alternative places. There are four physical places and four virtual places, which all are presented at Figs. 1–4.

The main data for analysis is the forms. In the analysis the focus is on test users' feelings what issues of a place give support to concentrating to the topic of discussion, and which issues complicate the concentration.

4 Results

The study about alternative places in Teams meetings focuses on both physical and virtual places. Participant's own physical place has effect on the participants' concentrations to the topic of discussion. Furthermore, the discussion partner's virtual place, i.e., background picture, also effects on the concentration to the discussion. First, the dimensions of the case are opened more and then is presented some elements that support or complicate the concentration in the telemeeting.

The result focuses on how alternative physical and virtual places are supporting the topic of the telemeeting. The effect is based on the dimensions of physical and virtual places. The physical place is where the person is located. The dimension of physical place presents how well the place is fitting to the topic of discussion. The virtual place bases on the image of the place that is presented in the background picture. The dimension of virtual place presents how well the virtual place is fitting to the topic of discussion.

Based on the two dimensions of the place, four categories are shaped. We observed that both physical and virtual places can either support or complicate concentrating to the topic under of discussion. The effects of the physical and virtual place on the topic of discussion are presented at Fig. 5.

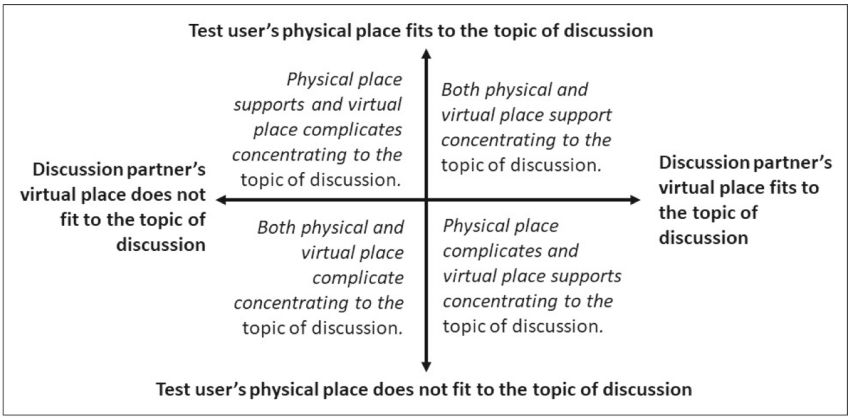

Fig. 5. The categorization of the physical and virtual places.

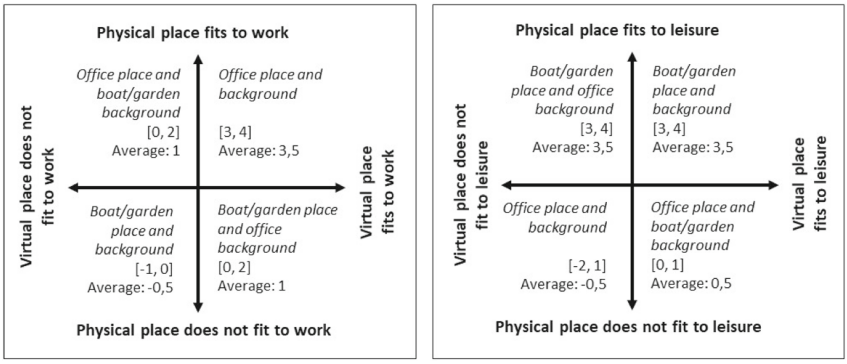

Fig. 6. The evaluation on focusing to the discussion in telemeetings based on the categorization of the physical and virtual places. In Fig. 6a the topic of discussion is work-related, whereas in Fig. 6b it is leisure related.

The analysis of the test users' focusing of the discussion in telemeetings is presented at Fig. 6. It is evaluated by using the scale [−5.. + 5]. The highest numbers were given in the cases where physical and virtual are in connection to the topic of discussion (i.e., 3,5 in average). That are the right higher corner at Fig. 6a and 6b. Furthermore, the opposite end, when both physical and virtual place are in the contradiction to the topic of discussion, the test users evaluated lowest (i.e., −0,5 in average).

The open-ended text in the forms outlines the feelings of the test users. The physical place at the office is ergonomically optimal, including few distracting elements. Also, the background image from the office is neutral. It does not produce distracting feelings.

The leisure places (i.e., a boat or garden) contain lots of distracting elements, including circumstances, as too warm or too much sun light, and disturbance, as extra voices and swinging the boat. Furthermore, the leisure background image cause positive feelings. That complicates concentrating to work discussion.

The background image did not have impact on the evaluation in the case of leisure discussion (i.e., trip planning): There the average number is 3,5 (see, Fig. 6b). The discussion about trip planning is very compelling. Furthermore, there were used also another screen, in which were maps from the area to which the trip was planned. The focusing to the map decreases the importance of background screen image. The other kind of effect in the leisure discussion was that when the topic of discussion is leisure and the physical place is the office, the test users feel guilty by misusing the work hours.

5 Discussion

This study analyzed the effect of physical and virtual place for concentration to the topic of discussion in a telemeeting. The result includes four categories based on two dimensions of the place.

The effect of physical place was surprisingly high for the researchers of this study. Both the test users mentioned numerous examples of the features of the physical place that supported or complicated the concentration. Furthermore, they also mentioned many place-related normative elements that had impact on the concentration. Although this result was unexpected, it is in line with an earlier study: physical place matters [3].

The effect of the virtual place was less significant. However, when the place of background picture was familiar, it sometimes gave for a short time the feeling that it could be nice to be there. Nevertheless, the background image is convincing. For example, in the 8th telemeeting the test user R1 supposed that the background picture of test user R2 showed his actual place. The test user R1 wondered why test user R2 had two headphones, one on his head and the other on the desk behind him.

This study continues the study of the effect of place in evaluating virtual prototypes [3]. However, more studies are needed. It is not established what kind of background images are useful for work context. For example, Tampere University offers photos for using background picture for telemeetings. Those pictures include the outside images of university buildings and common places inside of the buildings, e.g., libraries and hallways, but there are not pictures of offices or other private places.

One restriction of this study is that both test users and places are familiar to them. The situation where the participants do not know each other beforehand, should be studied. However, organizing such a study where the test users have actual co-operative task is not easy. Also, it needs to study what is a good work-related background image. For example, when designing a hydraulic device with a new colleague, is a university logo, office view or a picture of a hydraulic device, e.g., a valve, the best image to concentrate to the topic of discussion.

6 Conclusion

A telemeeting includes physical and virtual places. The physical place is the actual place, where the participant is, and it affects to his/her feelings. A background image in telemeeting forms the virtual place and it affects to feelings of discussion partner.

In out study we have found that both physical and virtual place can either support or disturb content of discussion in a telemeeting.

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