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Teaching Presence: Reflections on ten years of teaching presence design and production

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Abstract

Based on ten years teaching a Masters level course in presence design and production, an interdisciplinary team of teachers present a series of reflections. The topic of mediated presence requires that both teacher and student indulge in theory and practice from a range of disciplines. The course pedagogy described in this paper focuses team-based design, learning by doing, prototyping and scenarios. The intended learning outcomes (ILO) cover spatial and temporal strategies for producing presence, along with critical design concepts: how to establish trust in mediated environments and the formation of a tacit communication contract between participants.

The analysis of the reflective home assignment which concludes the course, shows that the intended learning outcomes were reached; the students show a fundamental understanding of how the presence experience relates to a combination of spatial and technical design. Through their prototypes and scenario constructs, the students further demonstrate necessary skills to successfully design, prepare and carry out a variety of presence situations extrapolated from their gained knowledge.

Keywords---Presence production, presence design, trust, mediated spaces, spatial presence, teaching presence.

1. Introduction

This paper accounts for a series of findings observed in a “Presence Production” course carried out over the last decade. The course is an integral part of the ordinary curriculum of the Masters programme in Media Technology given at KTH. The reflections within are based on shared experiences within an interdisciplinary teaching team, located at three different universities. Intrinsicly, the collaboration between our university sites involves mediated distributed teaching, which has in itself acted as a driving force to further develop the course pedagogy. The teaching concerns the design, production

and support of a contextual situation for presence, where the participants are geographically separated. Our decade-long tradition of design-led research and an on-going prototyping process has also resulted in numerous mediated spaces, interactive windows and walls, i.e. design artifacts emerging from different contexts of use and design, where participants in different locations experience a sense of witnessed mediated presence negotiated through dialogic interaction [1-3]. The research team is an interdisciplinary group with combined skills in architecture, media technology, anthropology, film, social media and broadcasting focused on spatial and technical designs to enable mediated interaction and an experience of eye-contact amongst participants (mutual gaze).

Presence design thus emerges as a new field, exposing both media technology discourse and architectural design practice to radical new concerns. It can be argued that throughout history a broad range of practitioners – architects, artists, writers and filmmakers – have already contributed a wide range of hybrid design artefacts from a juxtaposition of real space and mediated space, and such references make welcomed contributions to the very core of our teaching. What is new, today, is that it has become possible to populate these architectural extensions; to inhabit them in ways that allow people to interact and collaborate closely; to see and hear each other, in other words: to be present before one another whilst remaining in different locations. Designing for presence therefore implies the design of shared mediated spaces that, enable people to experience mediated presence as well as they might in a conventional building, possibly designed by architects.

Our teaching is informed by research that has determined factors that may contribute to poorer synchronizing [4] and ‘frictions’ [5] that inhibit knowledge-sharing in human interaction and collaborative co-present contexts. These are, for example, mutual gaze and trust. In effect, to be able to achieve mutual gaze has been observed as a key element in establishing trust, also in mediated interaction [6-10]. As noted by Nevejan, trust is a prerequisite to the individual experience of ‘witnessed

presence' in mediated environments [11-12] thus contributing a 'sense of being there' or of 'non-mediation' [13-15]. Trust is, further, a core element in the body of 'informal and tacit practices' which sustain knowledge-sharing in accordance with Polanyi's notion of tacit knowing [16-17] and Wittgenstein's concepts of rule-following and collectively established meaning [18]. A large body of existing research from the area of dialogue, skill and tacit knowledge [19] may also be applied to presence design.

These points cumulatively support the argument that the end-user's experience of a shared communication event is not purely a function of technical performance, bandwidth or excelling in low latency networking. There are many other components and several skills which have greater impact on the perceived sense of presence and therefore require our attention. This includes the design of each respective user's space, the shared mediated space created, the storytelling aspects and dramaturgy originating from more traditional media, e.g. TV, film and radio. Lastly, the ability to adapt to each participating subject's personal prerequisites and prior experience – all come into play in creating and upholding a shared sense of presence, and vividness in the interaction.

2. History of the Presence Production course – research through teaching

The course was initially given from 1995 at Gjøvik University College in Norway, while the actual teaching and examination was carried out remotely from KTH. This presented us with an interesting meta-perspective from start; the intrinsic temporal delay created by the geographic distance become very imminent, as well as the corresponding limitations of the audiovisual codecs and system framework available at the time. Originally, the name of the course was "Networked Multimedia", an obvious tell that our research approach started off with a far more technical focus than the direction taken over time.

Presence Production is mainly a project based course, in which the students developed their own synopsis and ideas for a presence situation. This situation or context could be something realistic - as in simulating a meeting between parties who are separated (e.g. a witness interrogation in a trial; a beloved husband and father on a remote oil rig). It could also be something fictitious such as a novel format for a game show on television. The projects were initially evaluated using four specific criteria during the live presentations transmitted from Norway to Sweden:

- Level of bi-directional interaction, did it feel like working together for real? How was the sense of trust established and confirmed?

- Strength of the story-telling, i.e. how well was the intent or "message" perceived?

- Level of complexity in the technical setup (use of cameras, channels of audio, mixing apparatus, chroma key etc) and its respective relevance for case at hand.

- Technology usage skill level, i.e. how well was the presentation performed from a technical point of view.

A fifth criteria relating to spatial presence and the concept of shared mediated space was later added, following the contribution from an architect to the teaching team.

The initial course acted as preamble when we were to extend this course offering to our own university students. So

from the year 2000 and onwards, students following the Media Technology programme at KTH could choose to enter the course which now was given to students in two countries. For the course in this new version, there was an outspoken need to give it a relevant title, and since the main focus of the course was an intentional production of presence, and to underline the intrinsic element of distance between the communicating parties, the course was given the name "Telepresence Production", which still remains to date.

During a period, another set of students from a third university joined the course. Yet, for the three most recent years, the course only enrolls students from KTH and the Media Technology program, normally now in their third or fourth year. The course in Telepresence Production has developed over the years with experiences from several related research projects, where the students play very important roles with their newly gained knowledge set into practice. Below are some of the most significant case studies we base our course on:

Connected Performance Spaces (Wallenberg Global Learning Network, KTH-Stanford 2003-2004).

Centre of Excellence for Sustainable Communications, project areas "Mediated environments" (2007) and "Mediated Spaces" (2008-2010) (Government funding and industry partners).

“The Mediated Pub”, 2007.

“The Mediated Conferences”, 2008 - “The Mediated Therapist”, 2008.

The Mediated Museum - mediated access to cultural heritage (National Heritage Board, 2006-2011)



Figure 1. “Connected Performance Spaces”

- The intention of Connected Performance Spaces was to allow performing artists and their respective audiences to share the same experience. Large back projection screens, chroma key, and multi-channel audio allowed musicians from two participating continents to experience a genuine notion of playing together, while being nine time zones apart.

Another aim was that each respective audience would experience that they were together in a shared mediated

space, and shared a mutual experience.

shared their grief that they could not participate at both events simultaneously – while, in effect, they could!

- The Mediated Pub 2007

Our designs for a Mediated Pub extended a scientific conference venue to another location, enabling remote mingling and socializing at a conference in Stockholm, whilst some researchers remained in York. Using semi-transparent mirrors, cameras and other audiovisual equipment remained hidden to enhance the notion of sharing a conversation as well as a pint of lager. The mediated window had a thin black frame, which disappeared into the evening atmosphere at the bar, thus allowing conference participants to experience an extension of space. As in the previous case, the experience of a spatial extension was strengthened by human interaction. Our observations confirmed that conference delegates had many interests and views to share.

- Our designs for The Mediated Conferences also used the informal meeting metaphor, but this time in a more formal shared space; that of an international conference with booths populated with researchers and their projects. One of these booths was in one sense empty, but extended the space by opening a window to another concurrent conference several miles away. Weeks prior to the event, several participants



Figure 2. The Mediated Pub. Hanging in the bar in two countries.



Figure 3. The Mediated Therapist

- The Mediated therapist 2008

In the spring of 2008, a mediated therapist treated twenty patients remotely, in a workplace designed to support remote presence. What is particular about this example is that it concerns a specific form of dialogic interaction, where trust is a core element and where any friction may be said to impact negatively on the experience of witnessed mediated presence [3 op cit].

- The Mediated Museum 2008

The last example of case studies we frequently use in teaching, is from a six-year research project relating to how mediated presence can facilitate public access to cultural heritage environments. In this case, a Museum of National Antiquities was extended to an archaeological excavation site where, during two weeks in the summer of 2008, the general public was invited to engage in a collaborative process with archaeologists. We designed a mediated glass-door, (with a similar set-up as in the other examples in order to enable mutual gaze and natural forms of interaction), that enabled visitors to remotely experience presence and to interact between the museum and the excavation site, thus creating an architectural,



Figure 4. The Mediated Museum.

mediated extension of space. [20].

Visitors interact with participants at the archaeological excavation site, standing in the mediated doorway. The project is an example of how museum can engage visitors in cultural heritage processes.

3. Presence Design

A fusion of architecture and media technology, video-mediated spaces facilitate collaborative practices across spatial extensions. An often-referred-to definition of (tele-) presence includes a reference to architectural design: “the use of technology to establish a sense of shared presence or shared space among geographically separated members of a group.” [21]. To date, however, an architectural design perspective has been lacking in presence research. One of its main contributors, IJsselsteijn, proposes a presence theory, which acknowledges that a spatial relationship is established when mediated presence occurs. It concludes that “for presence to occur, we first must direct our attention to the media environment at hand. Second, the environment itself needs to have spatial extent, putting requirements on its immersive qualities in terms of necessary depth cues, field-of-view, etc. Third, the ongoing construction of our sense of place is based on a limited number of ‘reality tests’. If what is ‘out there’ responds in a fast, consistent and reliable way to our real-time sensorimotor probing – transforming appropriately as we move our heads and bodies, changing predictably as we interact with elements of the immersive environment – this will establish a basis for our perception of being part of the environment.” [22]. Our own design-led research similarly confirms that mediated spaces can provide sufficient audiovisual information about the remote space(s) and other person(s), allowing the subtleties of nonverbal communication to inform the interaction. Based on our shared design experiences, Gullström [2 op cit] showed that in designing for presence, certain spatial features have an effect on the user’s ability to experience a mediated spatial extension (sense of a shared mediated space), which in turn, can facilitate the experience of mediated presence. She identifies spatial design concepts (e.g. mediated gaze, spatial montage, shared mediated space), which, unaddressed, may be said to impose friction, and thus impact negatively on the experience of ‘witnessed’ [11 op cit] or mediated presence. Mediated presence cannot be ensured by design, however, by acknowledging that certain features are related to spatial design, a presence designer can monitor them and, in effect, seek to reduce

Design-driven presence research

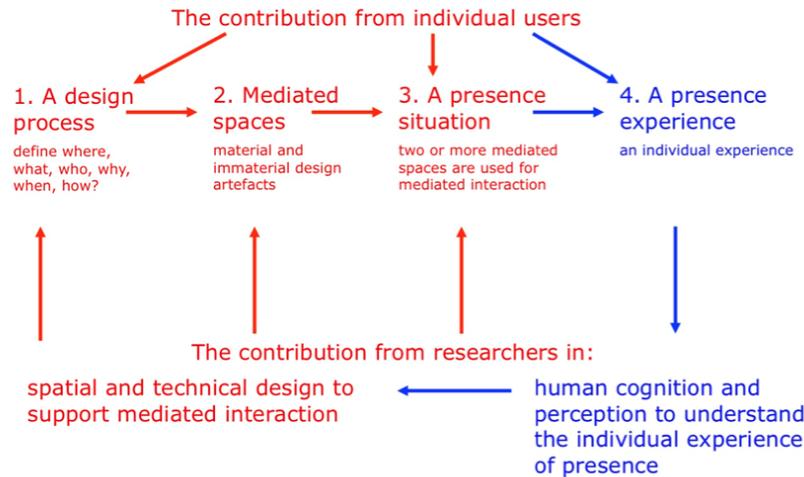


Figure 5. The presence design process

the ‘design friction’ that otherwise may inhibit e.g. trust and knowledge-sharing. The conclusion is that certain spatial tools play an important role in the process in which trust and truth is negotiated, hence with an impact on knowledge-sharing. Such designer observations comply with the general requirements for mediated presence and it has been our concern to further substantiate such observations, not by further claims that mediated spaces can work, but rather by showing how many of the issues Nevejan and IJsselsteijn raise, precisely are spatial design considerations. Mediated presence cannot be ensured by design. However by acknowledging that certain features are related to spatial design, the presence designer can monitor them and, in effect, seek to reduce the ‘friction’ that otherwise may inhibit the experience of mediated presence. Through design-led research our team has explored the potential of presence design over several years, by refining ‘what works’ and by developing our design prototypes, from applying them to new contexts, following the generic prototyping methodologies that characterize design practices. One could say that in each new project, we ‘tick off’ criteria such as proposed by IJsselsteijn [22 op cit], to check that everything still ‘works’. As designers, our focus is on refining the combination of spatial and technical design that facilitates mediated interaction.

4. The Presence Production course, version 2010-11

The course has today its focus on the combination of spatial and technical design. It is a project-based course held over an eight-week period corresponding to 7,5 ECTS credits.

The learning outcomes of the adapted course design in recent years are more extensive than in the original course. Although it previously included similar activities, it was unclear in which way these were aligned with the intended learning outcomes. In general, both the learning outcomes and the strategies to reach them have been improved. Further, the examination criteria have been made more explicit and the grading system is based on an assessment of all activities performed.

The revised learning outcomes are:

"After completing the course you will have gained practical experience as a presence designer and your personal reflections relating to the concept of mediated presence will be documented in writing. You will contribute to a design process and your acquired skills will be demonstrated through the design of a presence situation (or prototype), which you subsequently evaluate. You will be able to describe different prerequisites for mediated presence, such as the relationship between spatial and technical design; the

contribution from various transmission and presence technologies; the benefits of synchronized acoustic and

light design; as well as the importance of narrative (story-telling)." The relationship between the intended learning outcomes (ILOs), as presented in the course description and the course activities are discussed below.

The illustration above (Figure 5) shows our design-driven presence research process, as informed by users and by research in related fields, and which forms a basis for the course.

A design process strives towards a combination of spatial and technical design that meets users' needs. The design artifacts which emanate from these processes are both material and immaterial: mediated spaces are architectural extensions created from a juxtaposition of real space and virtual space to support mediated interaction between people in different locations, a context of use we refer to as a 'presence situation'. A presence designer can work with steps 1-3 to create a "presence situation". Step 4 of a presence experience can never be guaranteed, since it refers to an individual experience of mediated presence. However good preparations in steps 1-3, is a prerequisite for a reliable outcome with a high grade of repeatability

The students who follow the course have previously achieved basic knowledge of the technical innards of using video, audio, networking, schematics on how broadcast and IP-based services are provided, and how choice of materials, design and spatial layout affect the audiovisual environment. This is considered to form a necessary prerequisite to the course.

The course syllabus includes:

- Pre-comprehension, Calibration and Inspiration

The students, just as any one of us, have different experiences from presence situations. Most of them have been using low-end solutions such as Skype, iChat, MSN or other PC/Mac based systems. Some have experience from basic video conferencing using different hardware-based designated conferencing systems. Some may have experienced distributed concerts or opera performances, such as when the performances from The Metropolitan is streamed throughout Europe where audiences can enjoy music and theatre locally.

Thus it is important to harmonise the student population, to provide each student with adequate foundations, and a common denominator state of pre-comprehension for the subject, in order for them to appreciate and better contribute to the coursework ahead. This pedagogical task can be divided into a number of pedagogical efforts as follows:

- Inspiration lectures with examples

The referred research projects serve as a good source of inspiration, as do previous instances of student work in

earlier efforts which provide a bank of shared references to students and teachers. The aim is to provide the students with preamble understanding of the field. There are also lectures connected to the project theme.

- Theory lectures on the following topics:

- Technology & Design

Introduction to the technical building blocks; e.g. moving images, sound technology, lighting and computer science (including encoding, decoding, streaming data, security, quality of service).

- Architecture and spatial design

- Presence from different perspectives

Presence Production Presence Design Witnessed Presence

- Design processes in general and more specific for presence situations

- Contents, construction and use of a presence system



Figure 6. A tin-cans-and-string phone presence system?

Figure 6. A tin-cans-and-string phone presence system?

Does figure 6 show a presence producing system? Not really, it just shows a piece of equipment, though currently useless. We use this illustration to make a point that a presence system is constituted only if two persons pick up the cans, and while keeping the string nice and taught (i.e. being on-line), taking turns in talking and listening to one another, whilst continuously confirming one is being heard by the other, using different means of assessment (social protocol), then and only then a presence situation is established. Put simply, it is not enough to acquire and connect a plethora of technology to ensure mediated presence.

- Study visits

Depending on the theme at hand we also organize relevant study visits, i.e. to understand how a certain communication context is carried out without access to mediation. Other visits demonstrate how mediated spaces are created in more traditional media.

- Workshops

For a deeper understanding on key concepts, e.g. lighting, acoustics, chroma key, use of space, et cetera,

some topical workshops are organized to provide the students with the basic building blocks for presence design.

- Exercises

To make students familiar with the technical tools and to encourage reflection on the design process, the students work with a small project in the beginning of the course with a fixed theme, e.g. to design a coffee drinking session with another party who is geographically remote. This contributes a better understanding of what the combined technical and spatial design issues involved are.

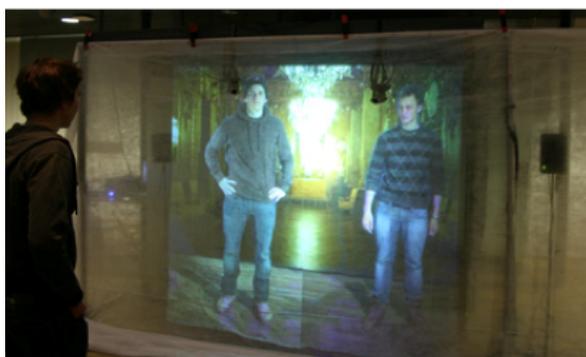
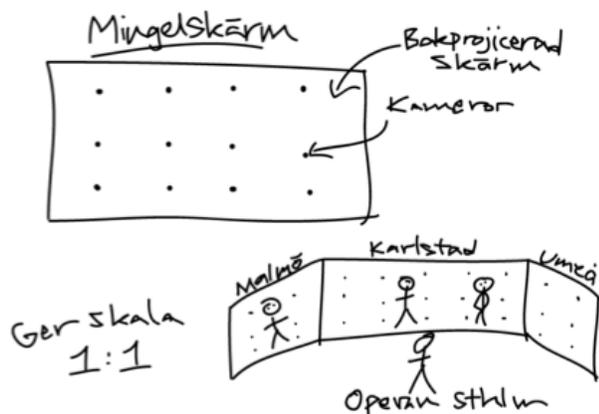
- Literature

The students are presented with a list of literature, relevant for their work (i.e. equally referred here).

Ideas evolve into sketches, refined via proofs-of-concept into full-fledged demonstrators. In this case a mediated opera foyer, where the students' intent has been to allow the local theatre visitor to share their experience live with theatre visitors at remote locations.

- Group work

The major part of the course is dedicated to a collaborative design project, where the students are divided into groups of about six students. The theme is decided by



Figures 7 and 8. Example of a student project.

the course management in relation to on-going research, e.g. themes like “the mediated museum” or “the virtual lunch” have been used. The theme for the 2010-2011 course was “Design a presence situation relating to a mediated opera performance”.

The format for the project work allows the students to work intensively for some weeks, after which a “mid crit” review session takes place, follow the assessment-through- discussion format used in e.g. architecture schools. Each group presents their visions and preliminary designs, often with the first conceptual ideas and perhaps a proof-of- concept mock up, slides or video. A final proposal is not required at this stage, but a sense of having “left the ground yet not knowing where to land”. The ideas are then discussed with the course management and with students in the other groups. Thus all students get valuable input and inspiration for their own project (and their learning process) by listening to, commenting and discussing with others working on the same theme.

Although the general theme is the same for all groups, each will make different interpretations to address the problems at hand.

After the “mid crit”, the groups need to decide on a direction for the design work for the remainder of the course. At the final presentation (Final crit), the groups present their work through e.g. sketches, drawings, text, prototypes, scenarios, simulations, or performances (a live demonstration of their work, a demo version, or equally valid - a well documented demo of prerecorded material). The intention is that the students, if possible, take part of the other groups' presence designs, and evaluate them to better contribute to the final discussion which concludes each groups presentation.

- Reflective home assignment

Traditional written exams under time pressure is not considered a relevant examination format in this kind of practice-based course. Beyond theory it is the reflective insights that the students acquire that we want assess. Presence is a subject which needs lots of reflection to comprehend even on a basic level as it contains so many elements.

The reflective home assignment is also meant as an integral part of the learning process. The students are asked not to start at once with the reflective home assignment after the project presentations and final discussion, but rather to wait a week or two in order for the insights to sink in. In conjunction to the reflective home assignment the students are also asked to go back to the recommended course literature, to collect more theoretical input to their reflections. Experience shows that the students comprehend more of the literature after

having worked with the projects than if they read it in advance.

5. Meta perspectives in the course

The course syllabus provides great opportunities to work with meta perspectives. Several of the activities include presence components, e.g. with lecturers or workshop tutors remotely present at different universities, all adding to the students experiences of mediated presence situations. We make a point at changing the designs of the lecture rooms and studio spaces we use, in order to illustrate the many variants, regarding technical, spatial, acoustic scenography and to stress the importance of a conscious use of spatial design for mediating purposes.

6. Results from examination 2010-2011

The results presented in this paper are primarily based on one part of the home assignment work. We have collected and summarized the students' replies to key questions, in order to aggregate some of their achievements from the most recently held course.

35 written home assignments have been read and evaluated with focus on the concept of mediated presence, following the instruction for the home assignment:

"Discuss the concept 'mediated presence' or 'witnessed presence' based on your own findings during the design process in the course. Select any text from the course literature relevant to this subject and argue for or against it, from the basis of your own observations and current experience as a presence designer."

The assignments were then read again, this time with the intention to extract keywords or key concepts which the students focus on in their reflections.

It is interesting to note that the result confirms the fact that a presence experience is an individual experience (see the presence design process, fig 1). In terms of what the students identify as important factors it reflects their own experience. Generally, the students have focused on one to three concepts. There is also a common understanding that is a combination of factors which together form a vivid sense of "being there". It is of course possible that students may have presupposed some things as being so intrinsically important, that they are not mentioned at all.

The major concepts that are addressed are: (listed in order of frequency)

- Space

Several students claim that the spaces (real, mediated and virtual) and the use of these spaces is the most important factor when designing a presence situation. In designing mediated spaces many terms can be borrowed from scenography to describe criteria such as the use of light, camera angles or audio setup.

- Context

Many stress that the context of use is important and that how the context is presented will have great influence on the design of the presence system as a whole.

- Suspension of disbelief

A remark is that the suspension of disbelief can be either willing [23] or unaware. In a mediated presence situation it is rather the unaware which is preferable, if possible. A parallel could be made with an illusionist who will not be fooled by watching a video recording of an own trick, but may be so, while watching a trick performed by another illusionist, before decoding how it was made. Even then, s/he may choose to be swept away, like when engaging wholeheartedly

in a scary movie, situated in outer space with well-known Hollywood actors.

- Technology

Comments about the technology span from possibilities to produce a "deeper" presence to its constraints. One comment is that technology has to adapt to human behaviour, rather than the opposite.

- Story telling

Opinions about story telling is mostly connected to the use of cameras (which in turn is strongly connected to the use of spaces, how spaces are introduced to and scenographically connected to each other). Problems with scaling have been mentioned, e.g. talking to someone who appears as very small. The story telling is also mentioned as being important to keep attention, or focus, on the communication over time.

- Relations/Trust

Many stress the importance of building relations to establish trust. E.g. "Why is the meeting taking place?" "What are the underlying intents of the parties?" "How is this conveyed?"

- Interaction

Some stress the importance of interaction between the mediated sites. This is relevant when describing the difference between "presence" and "awareness". Awareness is, in this case, defined as a latent form of presence.

- Witnessed presence

The importance of witnessed presence is also mentioned among the major concepts, referring directly to the course literature.

- New social protocols

In a normal interaction situation in a real space, we know how to act in different situations, supported by our experience. Eventually new social protocols will emerge in mediated communication situations, while it is still early in the evolution of mediated presence and dialogue.

- Habit

The habit of using presence systems for several types of communication will develop individuals trained in presence management. A reflection in conjunction to this, and the previous bullet point, is that an experienced presence designer, or a “user”, can decode a presence system and then know how to act within it.

- Individual experience

A few students also make reflections on the fact that a presence experience is individual.

Conclusion

An overall finding is that most of the students express an unfamiliarity with the “presence” concept at the beginning of the course, but equally express a deeper understanding of it after fulfilled course. Students have generally got high grading.

After the course, deep interviews were made with two students. While two interviews do not provide sufficient data, the students bore witness about their learning progression throughout the course. The free format teaching style was noted as frustrating at first, since engineering students tend to be used to work more by a checklist. But over time, the format became increasingly appreciated, forcing the students to take control over their own learning process. The reflective home assignment was also appreciated, especially as these could be carried out in a reflective process some weeks after the course. From the home assignments it is clear that for some, it was only as they were writing, that they first realized how much they have learned. Some made comparisons to a conventional written exam in direct conjunction to a course, which would not have provided so much learning as this examination form. The conclusion is that presence production is an area which benefits from a structured reflective learning process.

Further, a general conclusion that can be drawn is that all the students have reached the Intended Learning Outcomes and have thus acquired an understanding for the combination of spatial and technical design that constitutes the foundation for witnessed mediated interaction.

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