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'You just get sucked into it': extending the immersion process model to virtual gameplay experiences in managed visitor attractions

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ABSTRACT
This study investigates the immersion process in virtual visitor experiences in the context of a managed visitor attraction. It validates and extends previously developed models of the immersion process from tourism and proposes an underlying structure with four mechanisms driving the immersion process forward. Data was collected through semi-structured in-depth interviews with visitors participating in virtual gameplay at a commercial gaming centre in Oslo, Norway. Findings indicate that the immersion process is comparable across 'real world' and virtual visitor experiences and that the process consists of three stages (engagement, engrossment, and transcending involvement), corresponding with involvement triggers, involvement worlds, and the state of immersion. The study extends previous models of the immersion process by identifying the influence of pre-existing involvement as an 'involvement booster' enhancing the individual visitor's immersion process. The findings have implications for how the underlying structure and components of the immersion process can be understood and offers practical implications for experience designers working in the intersection between virtual and 'real world' visitor experiences.

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Immersion; immersive experiences; managed visitor attractions; immersion process; virtual experiences; consumer behaviour

Introduction

Experiences as a research topic have received increased attention from scholars across a wide variety of disciplines over the last few decades (Becker & Jaakkola, 2020). As a result, our understanding of the diversity of human experiences has expanded, and a range of experience-related concepts have been introduced. One such concept, which has become popular within the tourism industry over the last few years, is immersion. While there have been a few studies on immersion published in the tourism literature (see for example, Hansen and Mossberg (2013), Mossberg et al. (2014), Lindberg and Østergaard (2015), and Blumenthal and Jensen (2019)) and a few more related to leisure and work experiences (Carù & Cova, 2005, 2006; Fornerino et al., 2008; Mainemelis, 2001), most scholarly inquiries into immersion have been conducted within the field of Human-Computer Interaction (HCI) research.

Ideas of immersion as a sequential and progressive process progressing through the stages of engagement and engrossment before reaching the state of immersion (Brown & Cairns, 2004), have received widespread recognition in HCI research. In the consumer behaviour and

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tourism literature, however, the opposing ideas of the immersion process as instant or cyclical (Carù & Cova, 2005) or as dynamic in nature (Hansen & Mossberg, 2013), have gained recognition.

Recent research on the process of immersion suggests that visitors fluctuate in and out of different levels of involvement, ranging from engagement, at the low end of the involvement scale, via engrossment, through to the highest level of involvement – transcending involvement. Each of these increasingly higher levels of involvement are connected to a different phase in the immersion process: 1) involvement triggers, 2) involvement worlds and 3) the state of immersion (Blumenthal & Jensen, 2019). The visitors' progression through the different phases of the immersion process is influenced by the visitors' affective, cognitive and behavioural responses to the involvement triggers and involvement worlds they were exposed to during the experience (Blumenthal, 2020). These individual responses are however also influenced by several antecedent factors, including external factors, personal factors, social factors, and the visitors' appraisals of core components of the experience (ibid).

Although Blumenthal and Jensen's (2019) immersion process model incorporates elements from both HCI and tourism literature, it is developed solely based on what Neuhofer et al. (2014) would refer to as conventional tourism experiences. Despite the growing body of literature devoted to understanding the use of virtual applications in tourism experiences (Burt & Louw, 2019; Errichiello et al., 2019; Tussyadiah et al., 2018; Yung & Khoo-Lattimore, 2019), these studies have largely ignored the process of immersion. Previous research is mostly limited to discussing the role of immersion in e.g. transcending experiences (Lindberg & Østergaard, 2015) or statically measuring perceived immersion without looking at its temporal unfolding and escalation (Reysen et al., 2019). Technology-enabled experiences are, however, on the rise in tourism and are increasingly being used to enhance tourism and leisure experiences (Han et al., 2019). Being able to understand the immersion process in virtual visitor experiences is therefore becoming more and more important for leisure and tourism experience providers.

This study seeks to explore the immersion process in technology-enabled, virtual visitor experiences, in the intersection between tourism and HCI, in order to extend the immersion process model developed by Blumenthal and Jensen (2019) and Blumenthal (2020). This paper makes three contributions to the literature: 1) it investigates the immersion process model in a novel context; 2) it synthesises the findings of three case studies to identify mechanisms that facilitate the immersion process; and 3) it puts the identified mechanisms in relation to previous knowledge. The paper begins with a review of the relevant literature and a description of the methods employed followed by a presentation of the results. The paper concludes with a discussion and a conclusion section where the theoretical and practical implications of the findings and the limitations of the study are presented.

Literature review

Psychological and perceptual understanding of immersion

The definitions of immersion can be divided into two main groups: Psychological and perceptual definitions (Carr, 2006). Psychological definitions of immersion consider immersion to be a state, where the focus is on the cognitive features of the experience. In perceptual definitions, however, immersion is understood as a perceptual phenomenon and the focus is on technical aspects of the game and how these aspects can monopolise a player's senses and attentional resources (Jennett et al., 2009). These two types of definitions hence refer to different, but related concepts: Immersion as a psychological state (psychological definitions) and immersion as a feature of a technology (perceptual definitions).

In the tourism literature, the psychological view of immersion dominates. Hansen and Mossberg (2013, p. 212) for example, describe immersion as 'a form of spatio-temporal belonging in the world that is characterized by deep involvement in the present moment. Immersion involves a lack of

awareness of time and loss of self-consciousness'. Pine and Gilmore (1999, p. 31) on the other hand offer a more simplistic definition of immersion, defining it as the feeling of 'becoming physically (or virtually) a part of the experience itself'. While this definition is rather simplistic, it is one of the few definitions from tourism that considers that immersion can also occur in virtual environments. Tourism researchers have explored visitors' interaction with the experiencescape and how it might influence immersion (Mossberg et al., 2014). Studies suggest that tour guides may play an important role in facilitating immersion by creating a protecting frame around the experience (Hansen and Mossberg (2016). A few studies based on a psychological definition of immersion have also been conducted in connection to leisure and work experiences (Carù & Cova, 2006; Fornerino et al., 2008; Mainemelis, 2001). There, immersion is seen as a process of accessing the deepest level of an experience (Carù & Cova, 2007) through various paths (Mainemelis, 2001), and can thus be experienced in both extraordinary and ordinary, daily life experiences.

Most studies on leisure experiences, however, do not specifically investigate immersion or the immersion process. Typically, immersion is seen either as an aspect of an experience (e.g. immersive aspects of cruise ship experience in Miles, 2019) or as a particular type of experience (e.g. playing a musical instrument, creating art, or paddling a kayak in Ellis et al., 2020). Ease of escape through technology may cause a higher immersion in virtual reality compared to participation in offline leisure activity (Sharaievska, 2017).

According to the HCI literature, where perceptual definitions dominate, immersion is 'a description of a technology and describes the extent to which the computer displays are capable of delivering an inclusive, extensive, surrounding, and vivid illusion of reality to the senses of a human participant' (Slater & Wilbur, 1997, p. 604).. HCI researchers have studied the immersion process in computer games (Brown & Cairns, 2004), the different components involved in immersive gameplay (Ermi & Mäyrä, 2005), the relationship between social setting and immersion (Cairns et al., 2013), and the influence of game narrative (Qin et al., 2009) and music on immersion (Sanders & Cairns, 2010). A handful of studies in computer games have applied psychological definitions of immersion but they remain a minority. See for example, Witmer and Singer (1998), Jennett et al. (2008), and Cairns et al. (2014).

In this study, we adopt a psychological view of immersion following Mainemelis (2001, p. 557) definition of immersion as 'the feeling of being fully absorbed, surrendered to, or consumed by an activity, to the point of forgetting one's self and one's surroundings'.

Immersion and related experience concepts

In both tourism and HCI, the term immersion is sometimes used interchangeably or overlapping with other, similar experience constructs such as presence and flow (Calleja, 2011; Hansen & Mossberg, 2013). It is therefore important to clarify the differences between immersion and these closely related constructs.

Presence is a construct frequently used in the study of engaging virtual experiences such as computer games (Calleja, 2011). It is similar to immersion in that it is defined as a sense of 'being in' a virtual environment (Slater et al., 1994) or as 'the sensation of being somewhere else knowing that you are not' (Cairns et al., 2014, p. 20).. The difference, however, lays in the relational focus. Presence can be explained as the extent to which the virtuality of the experience is unnoticed or as the perceptual illusion of non-mediation (Chirico & Gaggioli, 2019). It is thus mostly concerned with the players' association with the virtual environment.

Another experience concept closely related to immersion is flow. The concept was first introduced by Csikszentmihalyi (1990, p. 4) who described it as 'The state in which people are so involved in an activity that nothing else matter'. He listed eight components of flow: clear goals, intrinsically rewarding, high degree of concentration, loss of self-consciousness, distorted sense of time, direct and immediate feedback, balance between ability level and challenge, and a sense of personal control. While some of these components are also a part of immersion (such as distorted sense of time and loss of self-consciousness), other components are not. Jennett

et al. (2008) for example, argue that it is possible to become immersed while playing computer games, even when the player's skills do not match the challenge level (i.e. when losing to a 'boss') or when the player does not receive direct and immediate feedback. Hansen and Mossberg (2013) similarly argued that in the context of tourism, reaching a state of immersion does not require the presence of a challenge, nor does it require a person to use their skills optimally. Immersion is hence not the same as flow, although it can be experienced as a part of a flow-experience and can be understood as one of the underlying components of the higher-level experience concept that is flow (Blumenthal & Jensen, 2019).

The immersion process models

The body of research on the nature of the immersion process has generated different theories of how the immersion process unfolds. Brown and Cairns (2004) were the first to develop a theory of the immersion process within the context of computer games. They described the immersion process as sequential and progressive. Consumers progressed through degrees of involvement, ranging from engagement to engrossment before finally reaching a state of total immersion. The lowest level of involvement, engagement, occurs when the consumer invests time, effort, and attention. An engaged consumer is interested in the experience and wants to keep going. From engagement, the consumer may be able to become further involved with the experience and become engrossed. At this level of immersion, due to the time, effort, and attention put in, there is a high level of emotional investment in the experience, which makes people want to keep going and feel 'emotionally drained' when they stop playing. The experience becomes the most important part of the consumers' attention, and their emotions are directly affected. Total immersion is detachment from the surroundings to such an extent that the experience is all that matters and is the only thing that impacts the consumer's thoughts and feelings. Extending this research, Carù and Cova's (2005) proposed a model based on their study of artistic experiences. They explain that there are two different paths to immersion depending on how experienced the consumer is. Experienced consumers become immersed instantly, while inexperienced consumers go through a cyclical process where they progress through the stages of nesting, investigating and stomping, before they reach the state of immersion. The state of immersion might however only last for a few moments before the consumer returns to the nesting stage and restarts the process. Hansen and Mossberg (2013), contradictory to the previous model, suggested that the immersion process in tourism experiences is dynamic in nature and that consumers fluctuate between different levels of immersion throughout the duration of the experience. Blumenthal and Jensen (2019) and Blumenthal (2020) studied the immersion process in the context of managed visitor attractions. Their findings suggest that the immersion process begins with the visitors' initial involvement being triggered by 'involvement triggers' during the 'engagement' phase in the immersion process. These involvement triggers can be memories, imagination, group assimilation, personal resource utilisation, or challenges (physical or intellectual), that can trigger internal responses within the visitors, leading them to a higher level of involvement. During the second phase of the immersion process, 'engrossment' – the visitors' attention becomes more focused towards 'involvement worlds', leading them further down the path towards a state of immersion. Both the involvement triggers and the involvement worlds arise from the visitors' interactions with the experiencescape and are dependent on the visitors' individual responses. The findings of Blumenthal and Jensen (2019) and Blumenthal (2020) are summarised in Figure 1.

This study aims to explore the immersion process in the intersection between tourism and HCI experiences and to extend the immersion process model developed by Blumenthal and Jensen (2019) and Blumenthal (2020). The extended model will provide valuable knowledge in the under-investigated context of technology-enabled, virtual visitor experiences. Gameplay in a gaming centre is chosen as the case context for two reasons. First, computer games are specifically designed to facilitate immersive experiences and are therefore especially suited to study the immersion

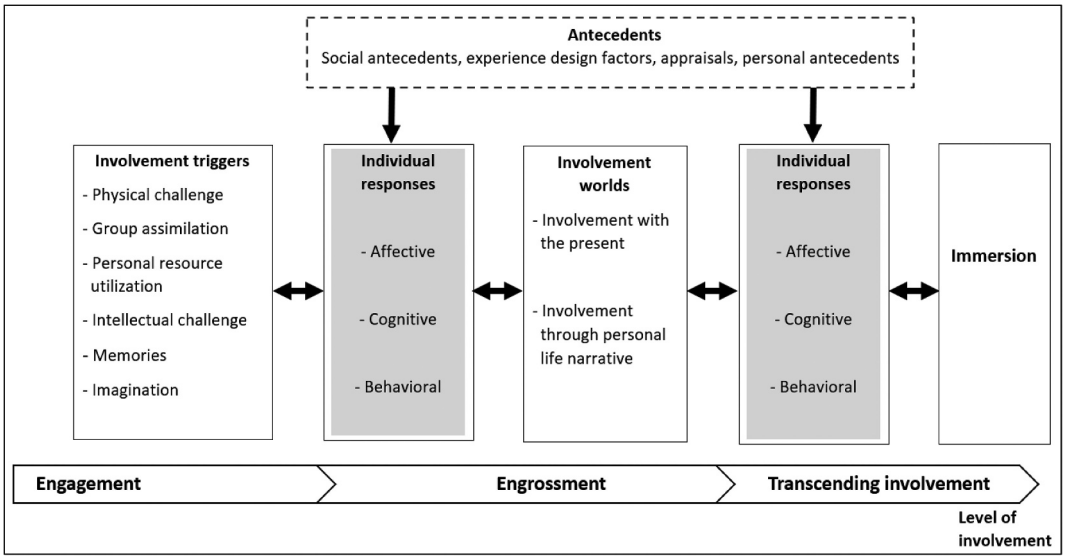

Figure 1. The immersion process model summarised (adapted from Blumenthal (2020, p. 20) and Blumenthal and Jensen (2019, p. 169).

process. Second, investigating gameplay in a context of a managed visitor attraction allows us to study the process of immersion in a social setting of dual experiencescapes (the physical and the game design features). By keeping the attraction 'constant', we can look at various ways in which visitors interact with each other, on-site personnel, and other visitors, as well as how these factors influence the immersion process.

Methods

This study was conducted as a single case study, utilising a deviant case design based on a purposive sampling strategy (Creswell, 2014). The case study approach was chosen as it enables the exploration of the immersion process within its real-life context and is considered particularly applicable for the study of a contemporary phenomenon that is closely connected to the context in which it occurs (Andersen, 2013; Yin, 2003). The single-case design was selected, as it allows a deeper exploration of the case context (Yin, 2003). This was key to the present study which uses contextually embedded empirical data to expand an existing theoretical model by introducing it to the study of a type of experience that differs significantly from the experience context in which it was originally developed. The case selected for this study was chosen based on three criteria: 1) It should be a virtual gaming experience; 2) it should be offered within the context of a managed visitor attraction and 3) it should be offered in an experiencescape that is themed, enclaved and perceived as relatively safe. The latter criterion was added as prior research has shown that experiencescapes (a combination of physical and social surroundings; Mossberg, 2007), that are perceived by visitors as themed, safe, and enclaved can facilitate immersion (Carù & Cova, 2007).

The case selected for this study was House of Nerds Oslo (HoN), a commercial gaming centre located in Oslo, Norway. The centre attracts a combination of local residents, day-trippers, and tourists (see Appendix 2) and can be categorised as a managed visitor attraction (MVA) according to Jensen's (2015) definition, which defines a managed visitor attraction as 'a phenomenon and/or theme in a presented form with the purpose of creating specific types of experiences for visitors. It will also offer supplementary services and service systems that support and expands the total visitor experience' (Translated from Jensen (2015, p. 274).. HoN fulfils the criteria of this definition, as it represents a theme (gaming) in a presented form, managed for the purpose of facilitating gaming

experiences for their visitors. It also offers supporting services including a kiosk selling food and snacks, a bar, and a lounge area. HoN furthermore fulfilled the criteria of offering an experiencescape that is clearly limited in time and space and is likely to be perceived by visitors as safe. The gaming theme is also consistently enhanced throughout the attraction, though gaming posters, life-sized game characters, TVs continually showing live gaming streams, and a separate 'nostalgia' room equipped with old gaming consoles and TVs. The attraction offers a wide variety of virtual games that are available through different gaming consoles (including computers, gaming consoles, and VR-googles). Virtual gaming experiences are one of the experience types offered at HoN through a variety of games and gaming consoles. This experience type was selected as it represented a technology-enabled experience product that is 100% dependent on the presence of technology for the experience to happen. It is also an experience type that is dependent on the visitors' active participation and involves visitor 'traveling' into a virtual experiencescape (game design features) that to some extent is separate from the experiencescape they are physically present in. The choice of using an experience type rather than one specific game product or gaming-technology (i.e. only Xbox games), was made as we wanted to explore a diversity of games to enable potential differences between game types and consoles to emerge. Virtual technology-enabled experiences at HoN took place in a social arena with both employees and other visitors present in the experiencescape, and with supplementary services supporting and expanding the visitors' experience. Furthermore, the managed visitor attraction context provided a relatively 'constant' experiencescape, which facilitated comparisons across informants and provided insight into individual differences between the informants' responses to the 'real life' experiencescape in which their virtual experience took place.

Data collection

The immersion process is highly individual and subjective and can therefore be difficult to assess (Mainemelis, 2001). This difficulty is enhanced by the lack of self-awareness involved in immersion. In previous studies, researchers have investigated immersion non-intrusively through retrospective interviews (see for example, Brown and Cairns (2004) and Hansen and Mossberg (2013)) or by utilising physiological measures such as eye-movement tracking (Cairns et al., 2006; Jennett et al., 2008). These approaches have their weaknesses, but since physiological measures were considered more intrusive, and therefore more likely to interfere with the visitors' experience, we chose to investigate immersion using retrospective semi-structured interviews. The interviews were supported by 'experience line charts', which have previously been employed successfully to the study of the immersion process (Blumenthal & Jensen, 2019; Hansen, 2014). These charts were used to guide the interviews towards peak moments of involvement, in line with the understanding of involvement as the driving force behind the immersion process (Blumenthal & Jensen, 2019; Hansen & Mossberg, 2013) and a high level of involvement as a potential indicator of immersion (Brown & Cairns, 2004). Following Jennett et al. (2008), informants were also asked to indicate how immersed they felt during the experience on a scale from 1 to 10 after being provided with a definition of immersion.

The interviews were conducted directly after the informants had ended their gaming session, while the experience was still fresh in their memory. During the interviews, informants were probed about their experienced level of involvement, prior experience with the game and the gaming centre, their thoughts about the game, social interactions during the game, different antecedent factors, and their responses to the incidents that occurred during their gaming session. The interview guide is attached in Appendix 1.

The data collection was conducted over the course of one week and only visitors over the age of 18 who participated in gameplay while visiting the facility were invited for interviews. Informants were initially selected based on a random sampling strategy, which gradually progressed into a more targeted theoretical sampling strategy, as the emergent theory pointed to new directions worth pursuing. Informants from different game settings (tournament, alone, online, with friends), game

categories (e.g. action, strategy), prior experience (inexperienced/experienced, first-time visitors/repeat visitors), and play duration were sampled (see Appendix 2 for descriptive informant data). Fourteen informants were interviewed for this study. Seven were interviewed together with their gaming partners and seven were interviewed alone. The interviews had an average duration of 50 minutes. The four interviews conducted during the tournament setting had a shorter duration (average: 34 min) due to the tournament schedule. The data collection ceased when a sufficient level of saturation had been reached and the interviews no longer yield any new theoretical insights (Gibson & Hartman, 2014).

Data analysis

The data analysis followed an adapted version of the three coding stages characteristic of the Straussian grounded theory approach: Open, axial, and selective coding (Strauss & Corbin, 1990). The first stage, the open coding, was conducted independently by the two authors and can be described as a semi-open coding process, as each author set out with four tentative, but pre-defined categories: engagement, engrossment, transcending involvement, and immersion (representing the involvement levels identified in Blumenthal and Jensen's immersion process model). The coding process in this phase consisted of repeated line-by-line coding of data. Both authors set out with a pre-determined focus on involvement levels (increases, decreases, and peaks, as indicated by the informants' experience line charts) and the factors influencing these changes. In the second stage of the analysis, the axial coding, the authors discussed and compared the codes and sub-categories that had emerged during the individual analysis, with the goal of reaching consensus. In the third stage in the analysis, the selective coding, the authors moved beyond the identification of themes, towards the identification of relationships between the identified sub-categories and the pre-defined involvement levels. These were then analysed and compared with the categories and relationships identified in Blumenthal and Jensen's (2019) and Blumenthal's (2020) immersion process model. While described here sequentially, the data was analysed through the circular, constant comparative coding process characteristic of the grounded theory approach (Blaikie, 2000; Strauss & Corbin, 1990). As emergent codes and categories were constantly compared as we moved back and forth between coding stages (semi-open, axial, and selective coding); redefining, refining, re-coding, and re-categorising emerging codes, categories, and relationships in a circular process (see, Figure 2).

This analytical process led to the identification of new sub-categories and categories, which resulted in the verification and extension of Blumenthal and Jensen's immersion process model. An illustration of how the authors developed the raw data into sub-categories and categories, with examples from the coding process, is presented in Figure 3.

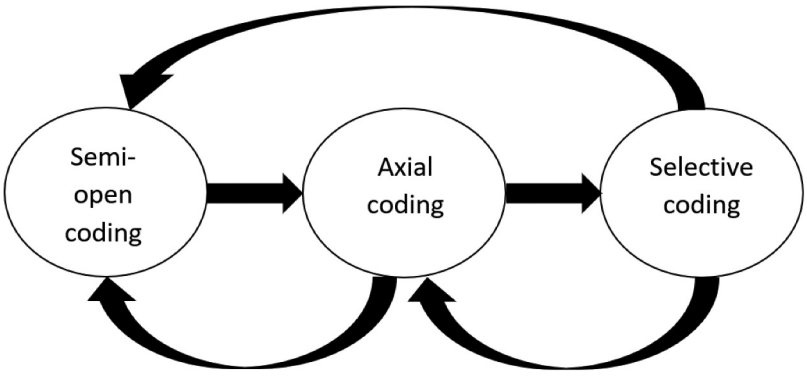

Figure 2. The circular coding process (adapted from Strauss and Corbin (1990).

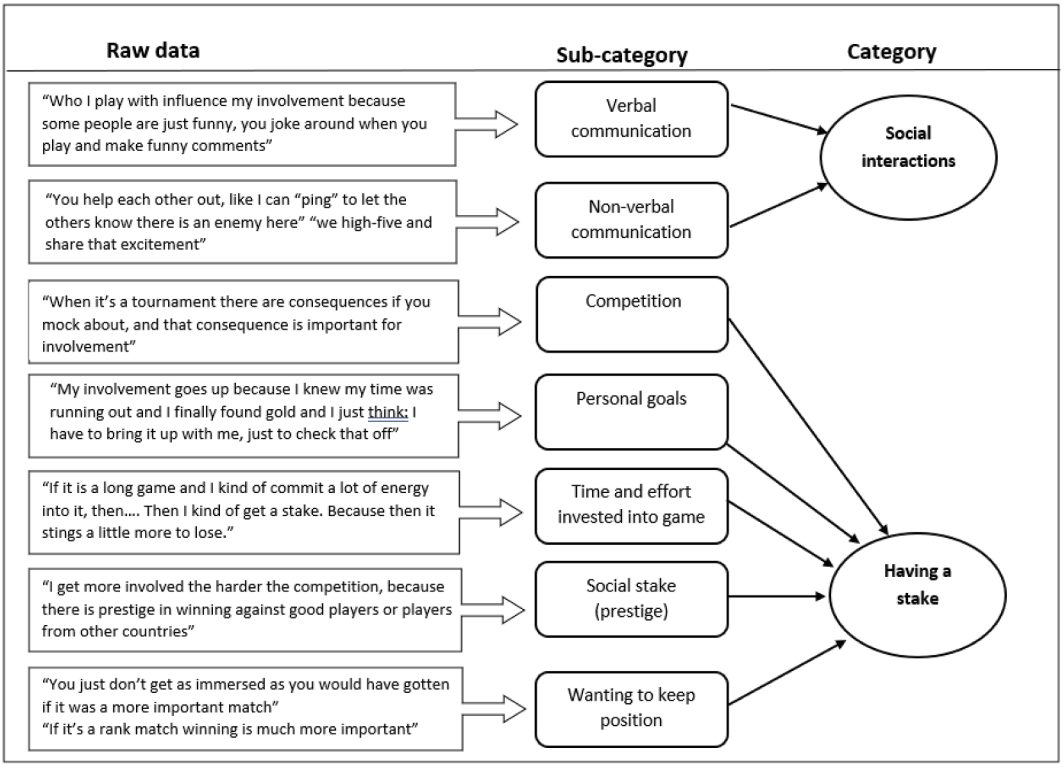

Figure 3. Examples from the coding process: 'Social interactions' and 'Having a stake'.

Results

In total, 21 sub-categories spread across six main categories were found to influence the immersion process in the present case context. Each of the main categories, their sub-categories, and their codes are presented in Table 1. 16 of these categories had previously been identified in relation to the immersion process in previous studies (Blumenthal, 2020; Blumenthal & Jensen, 2019), but the coding process also resulted in the identification of a novel main category, two new involvement triggers, one novel involvement world, and new individual responses that have not previously been linked to the immersion process. In the following section, each category identified in this study will be presented in more detail.

Involvement triggers

In the present study, five involvement triggers, factors that could trigger the visitors' initial involvement in the experience, were identified (see, Table 1): 'social interactions', 'having a stake', 'memories', 'personal resource utilization', and 'challenges'. The three latter have previously been identified in the immersion process in conventional tourism experiences ((Blumenthal & Jensen, 2019), whilst the two former represent novel categories. 'Social interactions' is related to Blumenthal and Jensen's (2019) 'group assimilation', as both involvement triggers are driven by interactions with fellow visitors. 'Group assimilation', however, is specifically about the experience of being part of a group or a team. 'Social interactions' include a broader scope of social relations which themselves, even without a 'team feeling', can function as an involvement trigger.

Table 1. Findings: The relationship between sub-categories, categories, and main categories.

Sub-category	Category	Main Category
C1 Verbal communication with teammates/ opponents C2 Non-verbal communication with teammates/ opponents	***B1 Social interactions (novel)***	A1Involvement triggers
C3 Controller proficiency C4 Hand-eye coordination C5 Tactile speed C6 Strategy development and execution C7 Understanding the game C8 Balance between challenge and skills	B2 Challenges (physical & intellectual)	
C9 Having invested time and effort into the game C10 Social stake (prestige) C11 Wanting to keep position C12 Personal goals C13 Competition	***B3 Having a stake (novel)***	
C14 Utilising prior experience and skills C15 Utilising explicit and tacit knowledge C17 Utilising personal resources and creativity	B4 Personal resource utilisation	
C18 Feelings of nostalgia C19 Childhood memories C20 Relating current experience to past experiences	B5 Memories	
C21 Intense focus (on the present) C22 Attention directed at the task at hand – the 'here and now'	B6 Involvement with the present	A2 Involvement worlds
C23 Intense focus (internal) C24 Attention directed towards internal reflections C25 Connecting the present experience to personal life story	B7 Involvement through personal life narrative	
C26 Intense focus C27 Feeling emotionally connected to characters C28 Being invested in the game narrative and/or characters C29 Emotional involvement with the game C30 identifying with character(s)	***B8 Emotional involvement with narrative/characters (novel)***	
C31 Lack of self-awareness and self-consciousness C32 Distorted perception of time C33 Blacking out/zoning in C34 Lack of awareness of distractions and 'real world' surroundings	B9 Immersion	A3 State of immersion
C35 Taking risks & testing new strategies C36 Playing creatively (freeplay) C37 Taking on a leader role C38 Not playing 'seriously'	B10 In-game (behavioural) responses	A4Behavioural responses
C39 Pushing through C40 Adjusting strategy C41 Self-reflection C42 Reflecting on one's performance C43 Resigning C44 Adjusting expectations	B11 Adversity responses	A5Cognitive responses
C45 Feeling of being (present) in the game C46 Going out of oneself C47 'I feel like I am the character'	***B12 Presence (novel)***	
C48 Engrossment C49 Concentration & focus peaks C50 Lack of awareness of distractions, surroundings & the 'real world'	B13 Absorption	

(*Continued*)

Table 1. (Continued).

Sub-category	Category	Main Category
C51 Being emotionally involved	B14 Emotional engagement	A3 Affective responses
C52 Feeling an emotional connection with character(s)		
C53 Involvement with the story		
C54 Wanting to progress/succeed/win		
C55 Excitement & adrenalin	B15 Emotional responses	
C56 Feeling of mastery		
C57 Enthusiasm		
C58 Positive surprise		
C59 Enjoyment		
C60 Feeling socially secure		
C61 Feeling/not feeling comfortable or safe		
C62 Boredom		
C63 Disappointment		
C64 Positive stress (eustress)	B16 Stress responses	
C65 Negative stress (pressure)		
C66 Not feeling stressed		
C67 Motivation	B17 Personal factors	A4Personal antecedents
C68 Mental state going into experience		
C69 Prior interests		
C70 Prior experience		
C71 Expectations		
C72 Personality traits		
C73 Competitiveness		
C74 Game script	B18 Game design features	A5External antecedents
C75 Graphics & audio		
C76 Game narrative		
C77 Game requiring focus and concentration		
C78 Opportunity to interact with other online players		
C79 Physical experiencescape	***B19 Experiencescape (novel)***	
C80 Distractive elements		
C90 Physically present teammates/opponents		
C91 Presence of an audience		
C92 Challenge perceived as too big/small	B20 Perception of challenges	A6 Appraisals
C93 Appraisal of opponents		
C94 Perception of progress and success		
C95 Challenge perceived as an opportunity to learn		
C96 Prior experience with the game	***B21 Pre-existing involvement with the game (novel)***	***A6Pre-existing involvement (novel)***
C97 Tacit competences		
C98 Knowledge of the backstory of the game/ characters		
C99 Pre-existing relationship with game character(s)		

Novel categories are shaded in grey and marked in bold cursive.

The feeling of having a stake could arise from external influences, such as competition. The visitor could, for example, feel as though their prestige was on the line, or the game could be a 'ranking match', the outcome of which would determine which league the informant would play in in the future. Alternatively, it could arise from internal factors such as having set a goal for oneself while playing or from having invested time and effort into the round.

> Informant 6: You get involved when you play multiplayer . . . you get involved because you have to perform and win

> Informant 6: If it is a long game and I kind of commit a lot of energy into it, then . . . Then I kind of get a stake. Because then it stings more when you lose.

Social interactions, in this context, consisted of both verbal and non-verbal communication (high-fives, exchanging looks, etc.) with both teammates and opponents. In the same manner as 'having a stake', these interactions could lead to an increase in involvement and an increase in the visitors' focus and attention devoted to the experience.

Involvement worlds

Three involvement worlds, which represented different paths to immersion, were identified in the present study (see, Table 1): 'involvement with the present', 'involvement through personal narrative', and 'emotional involvement with game narrative/characters'. Whereas the two former have previously been identified by Blumenthal and Jensen (2019), the latter represents a novel involvement world or path to immersion. Several informants reported feeling a strong emotional connection with the characters in the game. For some, this arose from having played with the same character for many years or from having positive childhood memories connected to a character.

> Informant 9: So I started playing him [Luigi] all the time and then eventually he kind of just becomes a part of you, you know . . . Over the years it's like you build an emotional connection with him.

For others, this emotional involvement came through having followed the character(s) through the narrative of the game and having both influenced and followed their growth and development.

> Informant 6: You kind of get like a relationship with the dragon. Because it was kind of like you get the dragon as an egg, and then it hatches, and then you played with her when she was little and then she just gets bigger and bigger . . . .

Some informants also described an emotional involvement that was more connected to the general story unfolding in the game, rather than to specific characters.

> Informant 7: For me, it is the story that is important, it's what makes me engaged. If it is a good storyline that is. A good story in a game, it is almost like reading a good a book, because I get really involved in books.

State of immersion

Nine of the fourteen informants reported experiencing a state of immersion during their visit to the gaming centre. This state was characterised by engrossment in the game, lack of self-awareness and self-consciousness, distorted perception of time, and a lack of awareness of 'real-world' surroundings and distractions. It was connected to a feeling of absorption into the game and was closely connected to concentration and focus peaks. It was described by informants as both a feeling of *'zoning in'* to the game (informant 4) and as *'blacking out'* from everything around them (informant 8).

> Informant 8: Then I can easily focus in on the game and the stuff that is happening in the game. Then I get kind of like this blackout from everything around me in a way.

> Informant 5: It is kind of like, if you get really engaged. Then, when you are done, you notice that. Oh, where am I? You know? It just like, you just kind of go completely into it.

Individual responses

Seven individual responses moderating the visitors' progression through the immersion process were identified in the present study (see, Table 1). These responses were both affective, cognitive, and behavioural, and while the majority of them have been identified

previously in the context of tourism, presence was identified as a novel individual response unique to the present experience context. The informants described presence as a sense of being present in the game, of going out of oneself and feeling like one is actually present in the game as if they *were* the character in the game.

> Informant 10: You place yourself in the character. Very much so. So, it's kind of like, when you get hit by something. I mean you don't feel it, feel it. But you kind of feel it.

This sense of presence arose as a response to the different incidents that occurred during the game. It had a positive effect on the visitors' focus and concentration, and positively influenced their level of involvement in the experience, as indicated by the informants' experience line charts.

Antecedents

In the present study, four antecedent factors that were found to influence the visitors' individual responses were identified (see, Table 1): the visitors' perception of the challenges they were faced with, the visitors' personal factors, game design features, and the physical and social experiencescape. While a variation of these antecedents has all been identified as influential in the context of conventional tourism experiences previously, the two latter have novel characteristics.

In virtual gaming experiences, visitors have to relate to two different experiencescapes. The experiencescape that surrounds them in the 'real world' (including physical and social surroundings) as well as the game design features, or the virtual experiencescape they journey into during their gaming experience. The latter is made up of game design features: graphics, audio, and the players' ability to interact with online teammates and opponents, the pacing of the game, in-game rewards, and the game's narrative.

> Informant 13: And when you play with people you don't know; you are a bit more careful and don't take as many risks. Again, that's because a random person can suddenly start yelling straight into your ears, and that's very uncomfortable.

Influential factors in the experiencescape included physical factors such as the layout of the gaming room, noise levels, distractive elements in the surroundings, and social factors such as the presence of an audience, teammates, and/or opponents present in the room.

> Informant 10: If my friend watches me play, it doesn't really matter. But if it is a large group of people watching, I feel like I perform better.

Both the experiencescape and the game design features were found to influence the visitors' individual responses to the different incidents that occurred during their gaming session, and consequently, their level of involvement with the experience.

Pre-existing involvement

Pre-existing involvement is a novel category that extends the immersion process model developed by Blumenthal and Jensen (2019). This category consists of a combination of factors, including the visitors' prior experience with the game, their tacit competencies (skills and knowledge), their knowledge of the backstory of the game and its characters, and their pre-existing relationship with game character(s). Thus, it consists mainly of antecedent factors, but unlike the remainder of the antecedent factors identified in our study (which influenced the visitors' individual responses and consequently, their level of involvement), it was found to have a direct influence on the visitors' level of involvement going into the experience. Just like the involvement triggers, this category was connected to the engagement phase of the immersion process. However, where the involvement triggers functioned as triggers that

could trigger the visitors' involvement during the experience, the pre-existing involvement category worked as a pre-experience booster, positively affecting the visitors' base level of involvement going into the experience.

> Informant 8: Generally, I feel pretty involved actually. Because I have played this game for a very long time . . . . It happens very automatically for me, when I play . . .

> Informant 14: I have even experienced that with a game I haven't touched in ten years, I can just sit down and I remember almost every button, and that stage between thinking that you want to do something and actually pressing the button to do it disappears. You can just dive straight into it.

An extended immersion process model

The immersion process in the present case was found to consist of three stages: Involvement triggers (1), which was connected to the engagement phase of the immersion process. Involvement worlds (2), connected to the engrossment phase, and finally, the state of immersion (3) which was connected to transcending involvement. The visitors' progression from one stage in the immersion process to the next is influenced by the visitors' individual responses (4), which in turn were influenced by several antecedent factors (5). This resulted in visitors fluctuating in and out of different stages of the immersion process throughout the experience, which indicates that the immersion process was dynamic in nature (See Appendix 3 for illustrative examples from the informants' experience line charts, showing their fluctuation between different levels of involvement).

The sixth and final main category identified as influential to the immersion process in the present case context was pre-existing involvement (6). This category functioned as an 'involvement booster', fast-tracking visitors deeper into the immersion process at a faster pace than the visitors who did not have such pre-existing involvement with the game. The relationship between the main categories and the connected involvement levels are illustrated in the context-specific immersion process model presented in Figure 4. In the model, the categories that represent extensions and novel contributions compared to the model presented in Figure 1 are highlighted in bold.

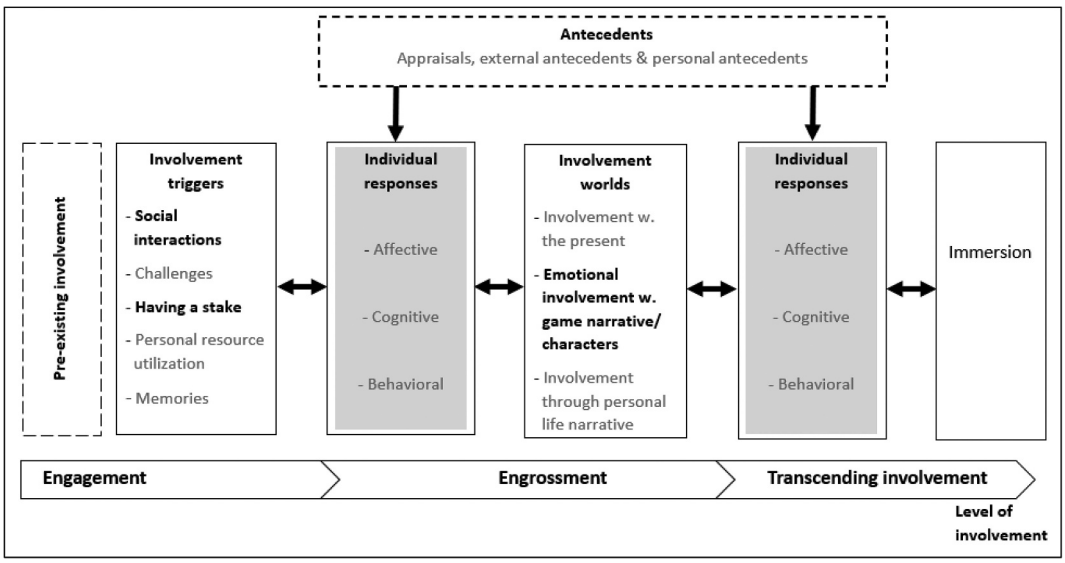

Figure 4. Extended context-specific immersion process model.

Discussion and conclusions

The aim of this study was to extend the immersion process model (Blumenthal, 2020; Blumenthal & Jensen, 2019) using empirical data from technology-enabled virtual gaming experiences offered in the context of a managed visitor attraction. The results presented in the previous section both validate and extends the previously developed immersion process model through the identification of several novel categories. This identification of new categories could indicate that there are contextual differences between the immersion process in different contexts and that the process is contextually bound. The identification of the category 'pre-existing involvement' is suggestive of this, as the category mainly consists of factors related to the visitors' prior experience and interaction with the experience product (in this context, the virtual game), which necessitates a context in which it is possible to have prior experience with the experience product. This was not the case in the contexts examined by Blumenthal (2020); Blumenthal & Jensen (2019), where guests were unfamiliar with the experience product. Although this is indicative of contextual differences, the consistent identification of the core components of the immersion process across three contexts, including the virtual experience contexts examined in this study, indicates that the underlying structure, processes, and mechanisms involved in the immersion process are constant across contexts. In the present study, as well as in Blumenthal (2020); Blumenthal & Jensen (2019), the immersion process was consistently found to consist of three stages (involvement triggers, involvement worlds, and the state of immersion), that were connected to increasingly higher levels of involvement (engagement, engrossment, and transcending involvement). In each study, the immersion process was also found to be dynamic in nature, with visitors fluctuating in and out of different levels of involvement. Indicating that the three stages and its dynamic nature is what makes up the fundamental structure of the immersion process. By analysing the relationship between the categories identified in this study and comparing them to the categories and stages of the immersion process identified in Blumenthal and Jensen (2019) and Blumenthal (2020), we were able to identify a series of mechanisms that consistently hold the structure of the immersion process together. These mechanisms are highlighted in Figure 5.

The first of these, which we have labelled Mechanism A, is the visitors' role as active co-creators. While the involvement triggers and involvement worlds identified in this study were facilitated by the experiencescape and experience product design, it was through the visitors' active engagement and interaction with their surroundings that the physical, social, and mental stimuli the involvement trigger represent were created. This aligns with the notion of consumers as active co-creators

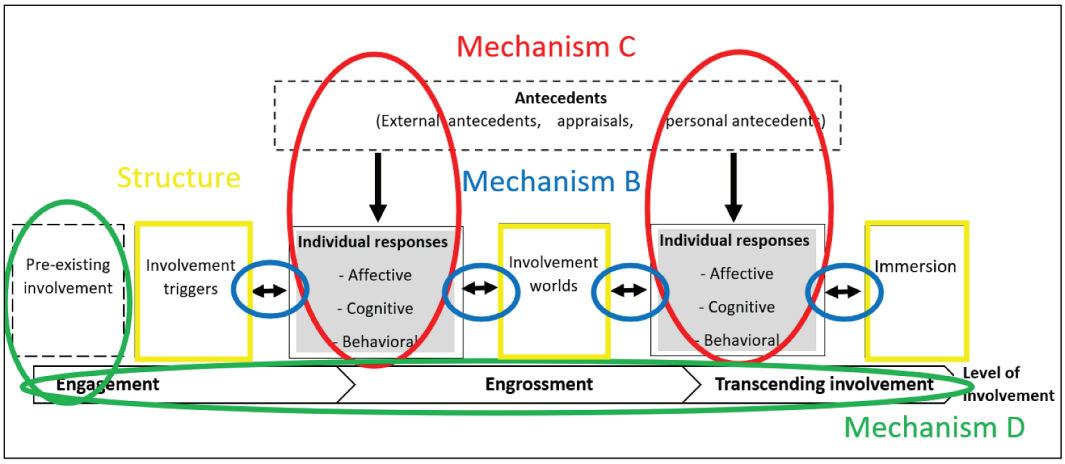

Figure 5. The structure and mechanisms of the immersion process.

of their own experiences, rather than passive consumers of externally produced stimuli provided to them by the experience provider (Mehrabian & Russell, 1974; Thompson et al., 1989). The role of the visitors as active co-creators thus appears to be a key mechanism in the immersion process. The second mechanism [B] is the mechanism through which the visitors' individual responses influence their experience of the stimuli the involvement triggers, involvement worlds, and the state of immersion represent. As findings across studies consistently showed that the visitors responded both cognitively, behaviourally, and affectively to this stimulus, and that their responses influenced both how they experienced or perceived this stimulus and became input to their interactions with new stimuli (e.g. other involvement triggers or involvement worlds). The third mechanism [C], is the mechanism through which the identified antecedents (appraisals, experience design factors, and personal antecedents) influenced how the visitors responded (cognitively, affectively, and behaviourally) to the different involvement triggers and involvement worlds. This resonates with the critical realist understanding of how experiences are formed, where individual antecedents (in the form of mental frameworks shaped by past experiences and personal beliefs), are considered to influence how we experience the world (Bhaskar, 2008; Neuman, 2011). The final mechanism [D], which the findings indicated to be the most important, is involvement (including pre-existing involvement). Involvement was consistently identified as central to the visitors' progression through the immersion process, as increasing levels of involvement were found to be the driving force driving the immersion process forward. Involvement has also, in previous studies, been identified as central to the immersion process (Brown & Cairns, 2004; Hansen & Mossberg, 2013). The findings of this study thus contribute to cementing the centrality of involvement as a critical mechanism in the immersion process while also identifying three additional mechanisms that play an essential role in the process.

Theoretical and practical implications and limitations

The identification of an underlying structure and mechanisms that appear to be consistent across different experience contexts has important theoretical implications as it implies that there is a fundamental structure in the immersion process that is generalisable across contexts. This has implications for both tourism and HCI, as it indicates a potential for knowledge exchange between the two fields. Where findings from HCI could be a valuable source of input for research on immersion in the context of tourism, and vice versa. Bridging the gap between immersion research in tourism and HCI could be of particular benefit to tourism as virtual and technology-enhanced experiences are becoming increasingly more popular in the tourism industry (Yung & Khoo-Lattimore, 2019) and there is a need for a better understanding of the differences and similarities in the processes involved in virtual and 'real world' tourism experiences.

The findings of this study also have valuable practical implications as it provides attraction managers and experience products designers with knowledge that can be used to design experiencescapes and experience products that facilitate visitor involvement and immersion. Providing insight into factors that may trigger visitor involvement in the experience (challenges, social interactions, having a stake, etc.) and the different paths to immersion (involvement with the present, emotional involvement with narrative and/or characters, etc.) which they can seek to activate by for example, including a strong narrative in the experience design. By identifying influential components and key stages in the immersion process, the immersion process model that is verified and extended through this study, also provides a framework experience designers can use to work more systematically with immersive experience design.

While the findings presented in this paper are grounded in the data and developed based on clear methodological procedures, this is an exploratory study based on a single case-design and a small sample. Findings should, therefore, be interpreted with caution. More empirical research is needed to validate the applicability and generalisability of the model and the underlying structure and mechanisms of the immersion process to a wider context of leisure experiences and to different user

groups. Despite these limitations, the present study contributes to building a cross-contextual understanding of the immersion process, expanding our understanding of differences and similarities between the immersion process in virtual, technology-enabled experiences and conventional visitor experiences.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix 1 Interview guide House of Nerds Oslo*

Topics to be covered	Keywords	Examples of directive support questions
Opening question	Experience curve	Please take an experience line chart and draw a curve of how involved you felt while you were playing. From when you sat down and started playing until you finished. When you are done, please walk me through the curve and explain what you were doing, what was happening in the game, and what was affecting your level of involvement.Describe what was going on and what you were experiencing/thinking/doing at the moment you have marked in the experience line chart as your most involved moment.
Personal antecedents	Prior experience and interest, expectations, purpose of visit, personal pre -dispositions	What is your prior experience with the game you played today? How do you think your prior knowledge/experience/ interest or lack thereof influenced your experience?
Social antecedents	Whom you are playing with/against, social/ individual play, team feeling, social support	Whom were you playing with today? Did you interact with your fellow players/opponents in any way? Do you think those interactions had any influence on your experience?
External antecedents	Game design, sound & graphics, teamwork required, pacing of the game, characters	How do you think the game design, pacing of the game, game characters influenced your experience?
Appraisals	Challenges, perception of progress and success	How did the game go? Did you find it challenging? Did you feel that you succeeded/made progress/failed? Did that influence your experience in any way? How?
Involvement triggers	Specific incidents/ factors/ thoughts that triggered you to become more involved	Were there any specific incidents /factors/thoughts that triggered you to become more involved in the experience?
Involvement worlds	Incidents/ thoughts/ factors that you focused on particularly	What was your main focus during the gaming experience? Were there any incidents/ thoughts/ reflections that particularly drew your focus or attention while you were playing?
Affective responses	Emotional responses, emotional engagement, stress	Did the experience evoke any particular feelings? How did you feel when you won/lost/progressed? Were you stressed at any point during the game? What effect did that stress have?
Behavioural responses	Active participation/passivity, responses to adversity	To what degree would you say that you participated actively during the experience? Did you participate equally actively throughout the entire experience? How did you respond when you were killed/lost/had to restart/ did not succeed?
Cognitive responses	Self-awareness, awareness of time, distractions and 'real world' awareness, focus, attention	How long were you playing? How aware were you of your "real world" surroundings while you were playing? Did you notice the people physically present around you? Did you notice any noises/distractions etc.? Did you at any point get a feeling of being in another world/time/place?
Immersion	Peak level of involvement	Describe what was going on and what you were experiencing/thinking/doing at the moment you have marked in the experience line chart as your most involved moment.
Closing question	Levels of immersion	Immersion is a state where you become so involved with what you are doing right here, right now that you completely forget everything else that is going on around you, including time, place, and your own self-consciousness. On a scale from 1 to 10, where 1 is the lowest. How immersed did you feel while you were playing? Please write down both the maximum and minimum level of immersion you experienced during your experience on your experience line chart.

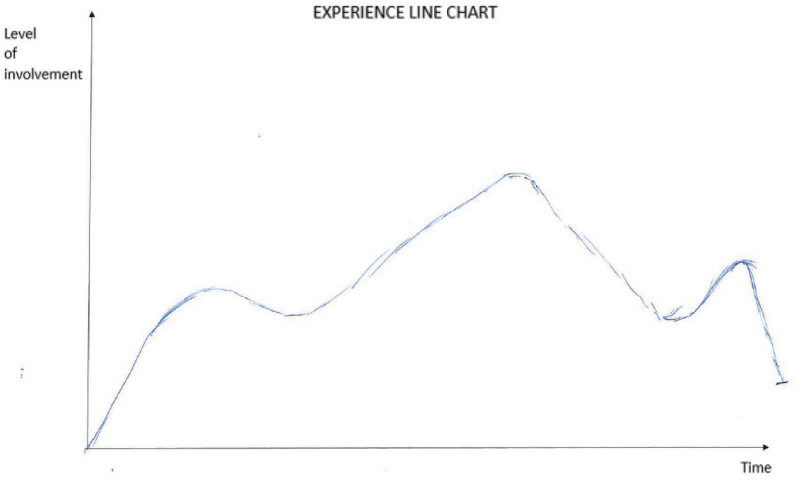
**The interviews for this study were conducted in Norwegian and this is a translated version of the original interview guide used in the study.*

Appendix 2 Descriptive informant data

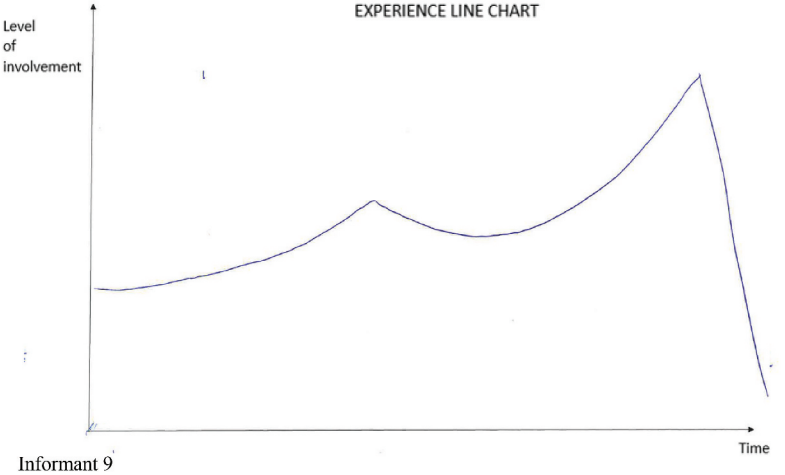
Informant no.	Gender	Age	Game category	Game console	Social context	Opponent	Visitation context	First time visitor?	Prior experience with the game**
1	Male	27	Action	Nintendo NES	Playing with a friend	The game	Tourist (VFR*)	Yes	2
2	Male	27	Action	Nintendo NES	Playing with a friend	The game	Local resident	Yes	1
3	Male	23	Strategy	PC	Playing on a team with friends	Online opponents	Local resident	No	4
4	Male	18	Strategy	PC	Playing on a team with friends	Online opponents	Local resident	No	4
5	Male	35	Strategy	PC	Playing on a team with friends	Online opponents	Tourist (business)	Yes	4
6	Male	33	Strategy	PC	Playing on a team with friends	Online opponents	Tourist (business)	Yes	5
7	Male	24	Strategy	PC	Playing on a team with friends	Online opponents	Tourist (business)	Yes	2
8	Male	27	Action/ fighting	GameCube	Playing against friends	Online opponents	Local resident	No	5
9	Male	21	Action/ fighting	GameCube	Tournament	Present in room	Daytripper	No	5
10	Male	22	Action/ fighting	GameCube	Tournament	Present in room	Daytripper	No	5
11	Male	18	Action/ fighting	GameCube	Tournament	Present in room	Daytripper	No	3
12	Male	25	Action/ fighting	GameCube	Tournament	Present in room	Local resident	No	5
13	Female	22	Action	PC	Playing With strangers	Online opponents	Local resident	No	5
14	Male	32	Sandbox/ survival	PC	Playing alone	The game	Tourist (VFR)	Yes	4

*VFR = Visiting friends and relatives ** The informant's self-rated experience with the game. Rated on a Likert scale from 1–5, where 1 is very little and 5 very much.

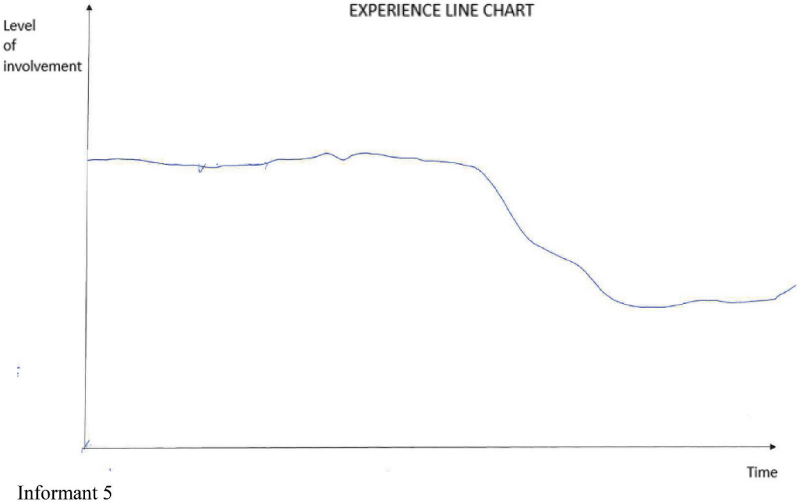
Appendix 3 Examples from the informants' experience line charts



Informant 3



Informant 9



Informant 5