GAMING TO COPE:

TRANSFER OF STRATEGIC KNOWLEDGE BETWEEN GAMING ENVIRONMENTS AND REAL LIFE FOR INDIVIDUALS' EMPOWERMENT

This research proposal is driven by the wish to obtain a Philosophical Doctorate at the Faculty of Rehabilitation Science at the University of Technology Dortmund. Games, virtual environments and gaming elements are currently being introduced in health care and rehabilitation practice as a tool to educate, train and empower individuals. The research I wish to conduct is interdisciplinary in nature and seeks to better understand the context and occurrence of certain psychological processes in order to better facilitate the implementation of gaming to promote the empowerment of any individual.

BACKGROUND AND OBJECTIVES

"Digital games, as a critical form of entertainment and social activity in contemporary society, hold tremendous potential for health promotion" (Wang, in prep.). According to Wang's research we can distinguish six primary game functions in digital games for health—distraction, rehabilitation, motivation & monitoring, knowledge acquisition, coaching & skill practice, and persuasion.

Research into the effects of game play has found that non-violent entertainment games have a positive effect on training, sociability, academic performance, therapy, spatial visualisation and cognitive abilities (Lee & Peng, 2006). Educational games have been found to have positive effects on learning, motivation, retention memory as well as proving itself as a utility for special groups (Lee & Peng, 2006). A more specific and well researched example is that of ReMission – a health game targeted at adolescent cancer patients – published by HopeLab in 2006. Experiencing ReMission game play has proven to enhance treatment adherence, a better understanding of several types of cancer and their treatment as well as improving the patients' sense of self-efficacy (Kato et. al., 2008).

Due to the societal concern of violence in games possibly triggering aggressive behaviour, violent games have been the favoured area of research on transference between the experience of game play and behaviour outside of the game environment. A meta-analysis of this corpus shows that only the heightening of the accessibility to aggressive thoughts is consistently found (Lee & Peng, 2006). This finding indicates that the transference between game environment and beyond is not as straightforward as stimulus X (the game) leading to behaviour Y (e.g., aggression). Instead stimulus X (the game) leads to psychological construct Z (heightened accessibility to aggressive thought) which is on the road to behaviour Y (aggression).

One such psychological construct and of particular interest in this PhD-research is the concept of *Strategic Knowledge*. Strategic knowledge concerns how to apply the principle of any learned content to a different context. This subcategory of cognitive learning seems especially suited to be on the road between the experiences in a game environment and resulting behaviour (Garris, Ahlers & Driskell, 2002). On the micro-level, strategic knowledge would be expressed in applying meta-cognition skills in or outside of a gaming environment. Strategies for cooperation, strategies for starting and/or maintaining social support structures and the usage of collective intelligence could be developed at the meso level and at macro level the application of strategic knowledge would lead to a perspective shift utilising game mechanics as a coping mechanism. These psychological constructs would aid positive behaviour, offering

support to deal with difficult topics without taking away a sense of self-guidance. Through gaming the player may learn constructs that will empower the individual beyond the game environment.

According to Self Determination Theory, we all have three fundamental needs – competence, autonomy, and relatedness (Ryan & Deci, 2000) and game play can meet all three. The need for competence is fulfilled by a task not too challenging but not too simple so one can feel competent, which relates to the concept of *Flow* (Csikszentmihalyi, 1990). The need for autonomy is met by one of the 'ground rules' of play; that it is voluntarily. Relatedness is addressed through social interaction between several players, between a player and an audience or between a player and a mediated character during game play. Fulfilling these three basic needs (by gaming) will heighten psychological well-being and self-motivation and self-regulation. The content of a game environment may aid individuals by teaching knowledge, skills and attitudes, meanwhile by connecting to our fundamental needs, the process itself can be controlled by the player.

After an extensive review of computer game studies, Lee and Peng (2006) conclude that scientific research is lacking in research on the experience of the gamer whilst gaming, and research on the media form that holds the gaming experience. This research strives to build a measurement instrument to compare several gaming forms on the concept of transference of strategic knowledge; believing this to be the key psychological construct leading to any behavioural effect. The main hypothesis of this PhD-research is that an *Alternate Reality Game (ARG)* environment is especially suited to induce transference. In ARG several media platforms and the manifestation of the players' life are combined into a new alternate reality. This particular game form is considered pervasive (Montola, 2005) or even immersive (McGonigal, 2003) and earlier research has shown that ARG-players experience a higher amount of *Perceived Reality* during game play compared to players of another mediated game form (Haring, 2010). Perceived reality, in turn, has been found to mediate multiple psychological effects of game play (e.g. Anderson and Dill, 2000). Exergames – games that require physical movement to interact with and control them - will be used as a comparative mediated form as they require a physical presence for a virtual interaction which leads to the idea that a sense of presence will be very high within this form. Massive Multiplayer Online (MMO) gaming will be investigated as another mediated game environment. MMO's share more traits with ARG than any other mediated gaming environment. Currently, exergames are often used in health-care and rehabilitation whilst ARG and MMO remain undiscovered by health professionals. By constructing and applying a sturdy measurement for the transference of strategic knowledge my hope is to have health professionals use gaming environments as a tool for rehabilitation with more confidence.

MAIN RESEARCH QUESTION

In order to best apply gaming to empower individuals, how might the transference of strategic knowledge best be facilitated in several mediated gaming forms, such as ARGs, MMOs and movement NUIs?
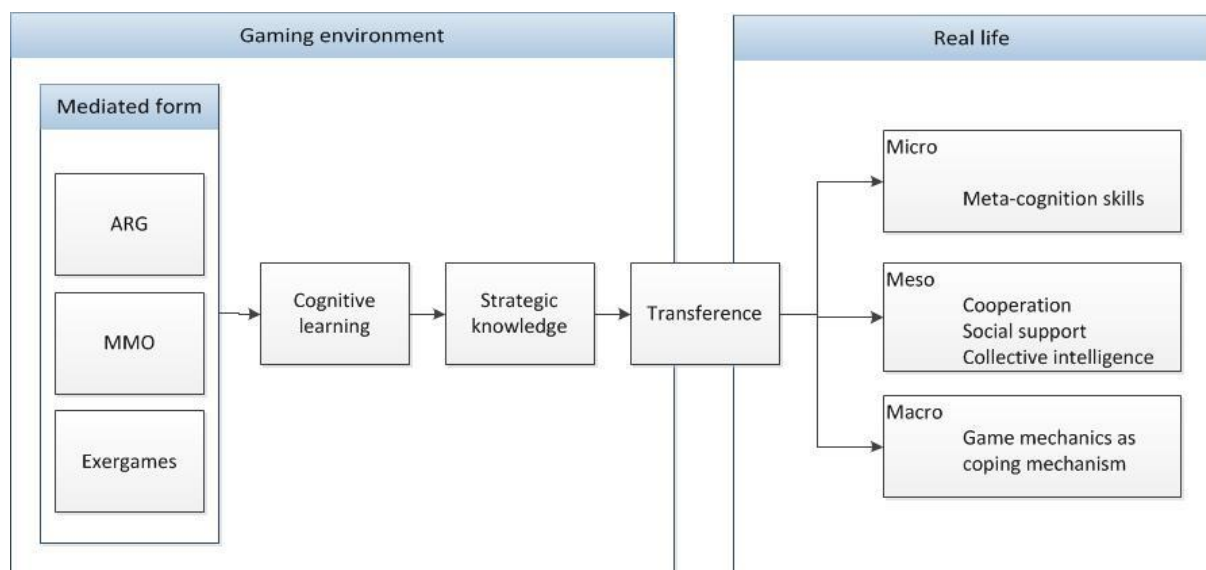
RESEARCH AND METHODOLOGY

Literature research will be focused on the following topics:

- Empowerment of individuals
- Transference of knowledge, attitudes and behaviour between gaming reality and everyday reality
- Characteristics of several media game forms
    - Alternate Reality Gaming
    - Massive Multiplayer Online gaming
    - Exergames
- Strategic knowledge
    - Micro level – meta-cognition skills
    - Meso level – cooperation, social support and collective intelligence
    - Macro level – applied game mechanics
- Measurements for psychological constructs within an interactive environment

The current state of research concerning transference in general and specifically transference through gaming will be investigated. Combining the results of this research with the characteristics of several gaming forms will result in a theoretic framework discussing the fit between a particular game environment and the transference beyond said game environment. The perspective of this discussion will stem from the criteria that facilitate the empowerment of individuals.

Player experiences will be examined by open-ended interviews. All interviews will be conducted online using a private audio-visual feed, recorded for purpose of analysis. A minimum of five interviews per category is necessary in order to reach any sturdy conclusions (Turner, 2010). This proposal aims for ten per category. One of the goals of this PhD research is to chart strategic knowledge in several gaming environments. Such an overview, combining the application of earlier research with the experiences of the gamer during game play, currently does not exist.

Building on the literature research and the interviews, a survey- measurement will be developed on the experience of strategic knowledge during gameplay and the transference between the game reality and everyday reality. This measurement aims to be suitable for researching different gaming forms. The development of such a measurement has its own obstacles. Already, I have found Daniel Oberski, Phd (Methodology of Social Sciences, post-doc at the University of Tilburg) willing to assist. The constructed measurement will be scrutinized by our own analysis and offered up for peer-review.

The created survey measurement will be taken in three waves, approximately six months apart. This longitudinal three-wave design allows for a within-subject comparison as well as a between-subject comparison. From these three waves of measurement, not only will there be valuable results based on the content of the questionnaire, there will also be an equally valuable analysis of the method. This is to ensure a robust survey-measurement that may be let out into the scientific community with confidence.

MAIN OBJECTIVES OF THIS PHD RESEARCH

- A discussion on the connection between a gaming experience and individual empowerment
- An overview of the current state of research on in-game learning and the (expected) transference outside of it.
- A research paper on the in-game experiences of strategic knowledge and its transference outside of it, including interviews with gamers.
- Comparison between different gaming forms and how their characteristics connect to promoting or limiting the transference of strategic knowledge outside of the game environment.
- A methodological paper about the obstacles and solutions of measuring game experiences.
- A robust measurement of the experience of strategic knowledge within several mediated game environments and its transference outside of it.

GLOBAL TIME PLAN

YEAR ONE:

- The first six months will be dedicated to literature research. The results of this research will be accumulated in a literature overview.
- Comparison of ARG, MMO and Exergames based on characteristics as they hold to different psychological processes
- Gamer interviews and analysis. The results of these interviews will be accumulated in a qualitative research paper, which has publication potential.

YEAR TWO:

- Literature research into the methodology of using a survey as a reliable means of measurement for psychological constructs in an interactive environment and measuring behaviour.
- Design and building of the measurement. Setting up of the survey and having it peer-reviewed. Results of literature research, design experience and peer-review will be combined in a paper on the methodological obstacles and solutions, which has publication potential.
- First wave survey measurement
  o Analysis of content and method

YEAR THREE:

- Second wave survey
  o Analysis of content and method
- Third wave survey
  o Analysis of content and method
- Analysis of the content of the three waves of the survey. These results will be accumulated in a paper, which has publication potential in the field of game research.
- Finish writing the dissertation.
- Releasing the measurement into the scientific community.

FIT OF THE CANDIDATE

My drive is the application of psychological knowledge and technical innovation to benefit individuals and/or society as a whole. My personal beliefs and scientific work coincide on the notion that self-efficacy can be better addressed within current behavioural dilemmas and that the play-frame is a powerful way to do this. However, we lack knowledge on what exactly happens during game play and what kind of effects we might expect under several mediated circumstances. If the processes on-going while gaming could be better understood, we could better facilitate a heightened sense of self-efficacy.

I have been establishing an expertise on the psychological processes that are involved in mediated gaming. In the past I have researched the ARG form and other gaming forms (see Appendix). I have given lectures and conference presentations on the psychology behind serious gaming (see Appendix) and had a book chapter published on this subject together with Ute Ritterfeld, Phd and Dimitrina Chakinska, BSc (see Appendix).

Through my earlier research and on-going interest I am currently connected to several gaming communities, the Dutch game developer community, the interest group Woman In Games and the innovation platform Ideas Waiting To Happen as well as the research circle of Family Group Conferencing in the Netherlands.

The research in this proposal requires very limited funding as it can mostly be done by myself, the much appreciated assistance of my network and the connectivity of the internet.

LITERATURE REFERENCES

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APPENDIX

ABSTRACT

Understanding Serious Gaming: A Psychological Perspective.

Haring, P., Chakinska, D., & Ritterfeld, U. (2011). Understanding Serious Gaming: A Psychological Perspective. In P. Felicia (Ed.), *Handbook of Research on Improving Learning and Motivation through Educational Games: Multidisciplinary Approaches*(pp. 413-430). Hershey, PA: Information Science.

This chapter argues the importance of understanding the process of serious gaming, i.e. playing a game with a purpose other than solely entertainment. Taking a psychological perspective, it focuses on the effects of the game rather than the game itself.

Emphasis is put on the experience of enjoyment as a core element of a successful entertainment gaming experience, which, in turn, is a prerequisite for a successful learning experience. To identify enjoyment factors in gaming a hierarchical model is presented which is based on empirical evidence.

Based upon the Entertainment-Education theory the authors propose a paradigm shift from motivation for game playing to implicit educational goals in serious games. A successful blending of entertainment experiences with educationally enriched content is assumed to be mediated by the experience of presence within media.

Furthermore, storytelling and character development as well as socially shared experiences are identified as valuable areas for future serious game development.

ABSTRACT

Head first into serious health gaming.

Ritterfeld, U., Roelofsma, P., Haring, P., Chakinska, D., Van den Bosch, M., & Versteeg, L. (2010).

Head first into serious health gaming. a^2e^2 as a new approach of digital exercise coaching for seniors. *International Journal of Computer Science in Sport*, 9 (2) 95-104.

With the development of an Adaptive Ambient Empowerment tool for the Elderly (a2e2) a group of technicians and media psychologists confront the challenge to change habituated unhealthy life styles. The main goal is to increase physical activity in seniors who are at risk of acquiring or are already suffering from chronic diseases. The a2e2 system incorporates exergames and applies a daily structure by using a digital coach. Several psychological processes must be taken into account if the system wants to stand a chance to achieve the behavioral change it wishes to mold into a healthier lifestyle. From the perspective of Self-Determination Theory, competence, autonomy and relatedness need to be addressed in order to achieve well-being. Intentional modes of self-regulation to achieve well-being often fail. However, implicit self-regulation offers new opportunities that are especially suited to apply in a gaming environment. Research has already shown that a virtual coach and a virtual environment can support positive results concerning interaction with the system and physical activities. Since the available research is still sparse elaborate pilot studies are required. This paper presents a short overview of the core psychological concepts guiding the development of a2e2.

Adaptive Ambient Empowerment of the Elderly (a2e2), Media Psychology, exergames, behavioural change, self-regulation

ABSTRACT

How Alternate Reality Gaming changes reality.

Haring, P.S. (2011). How Alternate Reality Gaming changes reality. The effects of playing an Alternate Reality Game on reality, during and beyond game play, compared to the effects of playing a Massively Multi-player Online Role Playing Game. *MSc-thesis, Communication Science track Media Psychology, VU University Amsterdam.*

The six key qualities that describe an ARG are cross-media, pervasive, persistent, collaborative, constructive and expressive (McGonical, 2004). The key qualities of any MMORPG are persistence, physicality, social interaction, avatar-mediated play, vertical game play and perpetuity (Chan, 2006). It is expected that perceived reality, cultivation effects, transference of strategic knowledge to real life and the experience of social presence in game will be higher for ARG players compared to MMORPG players, because of the incorporation of real life into game play. These expectancies have been confirmed for both perceived reality and social presence by an online survey (N = 81). Cultivation effects and transference of strategic knowledge were found for both ARG and MMORPG players, but the effects were not found to be significantly different between game types. In several studies of video games (e.g. Anderson and Dill, 2000; Ballard and West, 1996: Calvert and Tan, 1994; Dill and Dill, 1998) evidence is found that the level of perceived reality determines the psychological effects of the game play. The ARG environment has shown to create a higher sense of perceived reality compared to a MMORPG environment, therefore it is theorised that ARG's pack an overall bigger punch as to effects of game play.