Participatory Design in the Games for Health Domain: Why and for Whom?

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ABSTRACT
Participatory design (PD) has shown its utility in the field of health care in terms of both efficiency of production and acceptance by care givers and patients. The authors consider the particular case of video game design for health. This field involves the inclusion of extra roles such as game designers to create a more complex design which takes into account not only the health aspects but also the playful mechanisms of video games. For this reason the authors suggest that researches should be done to create a holistic participatory design approach for games for health.

Categories and Subject Descriptors
H5.2. *User-centered design;* H.5.3 Group and Organization Interfaces;

General Terms
Design, Human Factors,

Keywords
Serious games, health, user centered design, participatory design

1. INTRODUCTION
The term participation in the health domain can have several significations and revert different aspects of the field practice. However, as [1] describes, the confusion around the meaning of participation "bedevils any attempts to think structurally and politically about improving the health system through participative and responsive means". In addition [2] points out that the common usage of the term participation "to mean a lay member of a health service or policy committee - has tended to dominate and obscure the other meanings of the term which describe consumer participation as a social movement, or a strategy to reorient the health system". During our field researches and experimentations in the games for health domain we were confronted with the same "definition" problems when trying to do participatory design sessions.

Health, and particularly the medical field, is a domain that relates to many players, with many roles. These roles are not independent but complementary to each other. In the center of the scenario is of course the patient, the person who is in care. Around her gravitates a different number of people. The number and kind of roles of these people will vary depending on the health of the patient and depending on the aid the hospital or the care center is able to assure. Doctors, specialists and different kind of therapists, spouse(s) and family, are all people who interact with the patient and they can influence more or less directly his health. This influence could happen through diagnosis, prescriptions, manipulation, psychological or emotional support, advice or assistance to the sick person. This rich ecosystem is enacted independently from the kind of computer enhanced work conceived.

2. STATE OF THE ART
Medical institutions and services - or other health personnel - are complex systems. They include highly specialized knowledge and skills aimed to treat the higher number of people possible. They form what can be called an expert group, which uses its special skills on a second group, the laypeople (patients and relative), which is inherently in a subordinate position as she is requesting care and is usually devoid of the competencies she is looking for. As this relationship is the essence of care it is therefore essential to facilitate and improve the communication between these two groups in order to create tools which can better assist both groups. On the same line, [3] highlights in her work the importance for community members to liaise with health care workers and facility managers to be sure that the services offered by the health facility corresponds to laypeople's needs.

Previously, Arstein[4] described the different possible interactions between the power holders and the powerless, and proposes a 8 levels ladder of participation from "citizen control" to "manipulation". Each rung corresponds to the extent of citizens' power in determining the end product. [5] judges Arstein's ladder not adapted for health and too power oriented which limits effective responses and undermines the potential of the user involvement in the process. For this reason they propose a new model [5] and argue that user involvement in improving health services must acknowledge the value of the process, and the different knowledge and experience of both, health professionals and laypeople.

In recent decades, a number of user-centered approaches have been introduced for the development of health information systems, like Participatory Design (PD), usability engineering [6]

or contextual design [7]. In particular, PD methods in the field of health informatics have mainly been applied [8,9,10]. Indeed, [9] adapted PD adding a clinical trial phase to take the experiment into a real life situation, testing the idea with health care workers and patients who have not participated in the project. They conclude that PD provides an effective means for researchers from the seemingly disparate worlds of health science and computer science to work together.

Out of the health field, different design tools and methods for conceiving serious games have been proposed, such as the one focused on the usage of technical tools [11], the content centered model [12], design patterns for serious games [13] or the DODDEL model [14]. All these methods aim to enable people new to game creation, but with competences on the serious domain, to make pedagogical games aimed to transmit knowledge or skills.

However, little research exists regarding the particular case of video game design for health. It's easier to find technical tools developed in the context of research projects aimed to help in the technological creation of serious games for health, or studies on serious games interests, effects and scope [15,16,17,18,19]. However the case of serious games is more complex as it may appear in a first moment because of the presence of another stakeholder, game designers, in the design process. While they must be able to understand the needs of patients and therapists as in all the classical tools for health they have an additional challenge: integrate fun without disrupting the health flow and integrate health elements without disrupting the game flow.

3. OUR PERSPECTIVE

It's our opinion than when doing field studies to create a new tool or software to support health therapy it's important to consider a maximum number of point of views. If well combined, they can offer the patient the best treatment for his situation. To be able to operationalize this combination we firstly need to obtain as much as relevant information as we can (for example taking into account specific factors, as the social environment of the patient or the hospital equipment, physiological or psychological abilities, and so on). In addition we also need to be able to combine them in a coherent whole. A good participatory design should be able to provide a coherent solution, by highlighting possible collisions and providing the meanings to avoiding them. In our specific research the problem is amplified by the kind of tools we conceive and develop: serious games for physical rehabilitation. This kind of tool requires a high level of acceptance from both the therapist and the patient, considering the preconceptions linked to games [20], but it also requires to be an effective (for therapy purposes) tool.

Our first trial in attempting a coherent approach with different stakeholders is narrated in [missing for blind review]. In the paper we present a game for hemiplegic rehabilitation called "Hammer and Planks". The game was conceived with an occupational therapist, but having in mind the adoption of the same not only by patients and therapists, but also by the general public (for example to be able to involve the family in the therapy). This approach obliged us to rethink the way we were doing our participatory design sessions and has shown interesting results during a first experimentation at a game exhibition.

Along the same lines we are trying another approach, analyzing the many uses of Wii games in the therapeutic context doing observations in physiotherapists' cabinets. At the same time we are conducting observations on its current usage from the general public. Looking at how professionals use these games, we can watch benefits and disadvantages encountered by the patients. On the other hand, looking at the general public we can see which components foster the game enjoyment. Still, we need to define a coherent methodology able to cross the findings.

4. ISSUES TO BE DISCUSSED IN THE WORKSHOP

If the participatory approach seems to be beneficial for many reasons to designing games for health, it raises however several challenges. In particular in the workshop we would like to address the following problems.

- Is assumed that to design a useful tool, experts' involvement in the design and development phases must be continuous and regular. However health practitioners have very limited time for work interruptions. How can we maximize the quality of this time? Which kind of methods are best suited for Are there any methods or tools to facilitate compliance

- To what extent is it really possible to do Participatory Design with patients, taking into account their specificities and their handicaps?

- How to establish a complete and comprehensible dialogue between health professionals, patients, family, and game designers to properly share knowledge and experiences?

- How to resume in coherent whole the results of the Participatory Design session? Again, which methods are best suited?

- How do we evaluate the resulting tool? With which kind of population?

- How video game designers and health care providers can combine their unique talents?

- To what extend the inclusion of different roles in the design process can improve the acceptance of the developed tools, particularly with video games and the preconceptions people have about them?

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