Using Player-personas in Game Design for Children with Autism

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INTRODUCTION
Game design iteration and particularly its testing and evaluation phase heavily rely on user observation and feedback. When designing for children and other audiences who cannot fully express their actual needs and preferences, these are often misinterpreted and thus misunderstood (Costa et al. 2015). Moreover, organizing play testing to allow such evaluation among children with special needs requires support from various stakeholders, is particularly time-consuming, and may be uncomfortable for the children.

Using personas, design tools created to provide the designer with an abstraction of a potential user, is considered effective when addressing such audiences (Yilmaz 2017). Persona is a word derived from Latin and refers to a theatrical mask. It was first used by Cooper (1999) to help represent expected or typical users of a product. Personas are based on expected motivations and behaviors instead. These are drawn from design testing, user feedback, and user data in general. Therefore, personas are created as models of people's behavioral patterns, motivations, and the assumed real-world context (Zellhöfer 2014). The use of personas falls under the well-established paradigm of usercentered design (Helander et al. 1997; Preece 1994) where the related frameworks of participatory and empathetic design help designers to better understand the ways in which real users may approach designed products.

Today, personas are widely utilized in design across a range of fields, including areas of digital product and experience design such as the design of mobile apps, web pages, and video games. Among others, Zimmermann and Vanderheiden (2008) describe how personas can be applied to express accessibility requirements in software development. In game design, personas are utilized to identify player types (Heeter 2008) and to target

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specific gameplay for interests, skills, and needs (Canossa 2009). Da Costa, Rebelo and Teles (2016) document the use of Child Personas (CP) when designing an educational game for children suggesting that they allow a more cost-effective and less time-consuming design process.

Our interest in this paper is to approach personas as tools that support game design for children with special needs. Specifically, we draw on a game design research project that focused on creating and testing a touch-screen enabled mobile game for children with autism spectrum disorder (later, ASD). The purpose of this paper is to illustrate how personas can be utilized in game design for children with ASD. Typical persona creating methods are data-driven processes where behavioral patterns guide their design (Goodwin 2001). These personas are created based on quantitative findings. In such an approach, the key towards effective personas is to design appropriate ways for data collection. Where Canossa and Drachen (2009) suggest a player metrics driven persona development, our aim here is related but significantly different. This paper discusses creating personas based on expert interviews and literature instead and suggests ways to include metrics in persona refinement.

APPLYING PERSONAS IN DESIGN

In our study, we used existing literature and small-scale testing together with therapist interviews as a basis for persona creation. Open interviews conducted with speech therapists and other key people working with the target players indicated several specific requirements for design work. These range from sensitivities to sound and touch to students' tendencies towards specific repetitive behaviors or lists of personal interests. A literature review in the area confirmed that several of these design concerns were typical for the group of children with ASD in general.

The key behavioral patterns were then turned into the personas themselves. The approach assumes that by using a combination of several such personas to guide design, the resulting game would be made to cater for autism in general regardless of significant differences between individuals. It is indeed rare that a single person would perform all the patterns or that one person would always perform only one of them, creating personas around behaviors helped to take all of them into account at different stages or design and development. However, the behaviors are typically clustered and specific anxieties or difficulties lead to specific kind of behavior. Accordingly, these clusters were turned into personas. Three personas were created covering self-stimulatory behavior, social anxiety, and aggressive behavior.

The function of personas was to guide decision making on game mechanics, navigation features, and general interaction with the game and game platform hardware. As such, personas help designers to focus on the users and keep them in mind throughout design, evaluation, and the overall process of design iteration. This approach significantly reduced the need for personally involving target players in design evaluation. Testing sessions with the target group can therefore be more focused on the actual product instead of background knowledge. Moreover, using personas served our intent to create games for a new audience where very little earlier research about the target group as players is available.

In a multidisciplinary design team, personas improved communication between members by providing concrete design goals and shareable guidance. They helped to overcome differences in members' technical or specialized skills and expertise as they provide an

additional, higher-level layer for design communication. Personas allowed us to cover a range of behavioral patterns and interests of such a diverse category used for grouping people.

Design evaluation in the project involved regular testing sessions with target users. Most importantly, the new designs were always tested by considering them from the point of views and capabilities of the personas before real target users were invited to test. This allowed us to be more prepared instead of facing big issues in face-to-face settings. The process was followed by evaluating and refining personas after each testing session based on observations and questionnaires. Clarifications were also added to the persona descriptions when new related literature was available or old ones reviewed.

CONCLUSION

We introduced personas as valuable tools for game design when the target group is children with special needs. We wanted to utilize a user-centered approach regardless of the target group's inability to express emotions or verbally describe their experiences. Personas created based on relevant clinical and psychological science literature was used as a basis for later development of personas based on play testing with the target group. Personas helped us to build appropriate characteristics during game design.

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