

Anthropomorphism-Based Focus Group Protocol to Select Gamification Mechanics

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ABSTRACT

In this position paper, we propose a focus group protocol based on an anthropomorphism approach that can be used with both patients and caregivers to select suitable gamification mechanics in an eHealth or well-being context. In our current project, where we will apply this protocol, we are investigating whether the combination of gamification and context-aware recommender techniques can increase the motivation of people to adhere to telemonitoring actions. This proposed focus group protocol might also be useful in other domains, for example to select gamification mechanics in a well-being and flourishing context.

ACM Classification Keywords

H.5.m. Information Interfaces and Presentation :
Miscellaneous

Author Keywords

Gamification Mechanics, Focus Group, Anthropomorphism

INTRODUCTION

The objective of our current project is to investigate whether the combination of gamification mechanics and context-aware recommender techniques can increase the motivation of people to adhere to telemonitoring actions as part of their therapy, and hence, whether these ‘intelligent’ gamification mechanics can reduce drop out. Telemonitoring is defined in this context as the usage of information technology for the tracking and monitoring of the physical well-being of patients, at a distance [21]. Although telemonitoring is highly automated,

there are still actions that are left up to the patient. Typically, patients need to setup a Bluetooth connection, wear the sensor appropriately, and charge the battery. A lack of adherence to telemonitoring actions in eHealth (“*an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies*” [7]) is therefore well documented. For example, Eysenbach [8] states that there “*is the observation that in any eHealth trial a substantial proportion of users drop out before completion and stop using the application. [...] for many eHealth trials, in particular those conducted on the Internet and in particular with self-help applications, high dropout rates may be a natural and typical feature.*” The Economist’s Intelligence Unit [6] reported on drop-out rates of 144 mobile health companies: 67% of the users of fitness or mobile health apps that needed to enter data manually, stopped within 6 months. Surprisingly, in the case of automated data capturing, e.g., tracking via sensors, even a higher dropout was reported, namely 74% [22].

To maximize the effect of telemonitoring, it is important patients are motivated (and kept motivated) to adhere to their therapy. Research suggests gamification can have a positive impact on health and well-being when it targets behavioral outcomes [13]. Gamification mechanics might thus be able to motivate patients to adhere to their telemonitoring actions. However, it can be difficult to select appropriate gamification mechanics. To help researchers and designers select suitable gamification mechanics in an eHealth context, we propose a focus group protocol based on an anthropomorphism approach.

In the next section, we will first introduce focus groups, present some background on tailored gamification mechanics, and discuss the tendency of people to anthropomorphize technology. Then we will present the proposed protocol in detail. Before we conclude the paper, we present a brief discussion on user types.

BACKGROUND

Focus groups

Focus groups, sometimes referred to as group discussions [25], differ from in-depth interviews as most data comes from the interaction between participants. As indicated by [2], “*descriptions of a focus group vary but usually include a semistructured session, an informal setting, moderation by a facilitator and possibly a co-facilitator, such as photos.*” They serve to collect rich and detailed feedback. Based on the group discussions, individual answers become sharpened and refined. On the other hand, they might also expose differences between participants that are important to address.

Focus groups create a synergy [28] and have been used before in a gamification context. Sepehr and Head [27] used focus groups to identify key gamification mechanics in ERPsim, which is a gamified system to teach SAP ERP. Fitz-Walter et al. [11] used focus groups to gather input for achievement related design elements.

Tailored Gamification Mechanics

Gamification harnesses the motivational affordances of gameful experiences to influence psychological outcomes and further behavioral outcomes [12]. Effective gamification is a combination of game design, behavioral economics, motivational psychology, and user experience and user interface design [3]. However, Hamari et al. [12] has shown that gamification is not a panacea. Research has shown that different user groups and personality types necessitate different gamification mechanics [4, 19, 30]. Where some users may be motivated by competition and leaderboards, other users may be discouraged by competitive elements [26]. Whereas some users may be encouraged by challenges and quests, others may dislike the strong focus on achievement. Hence, there is a need for intelligence with respect to which gamification mechanics are appropriate for specific personality types and user groups. Careful consideration is thus needed to select a set of gamification mechanics. In this work, we build on Marczewski’s 52 gamification mechanics [17] to let participants of a focus group select gamification mechanics.

Anthropomorphism

Technology can be hard to grasp, especially for non-technical people. Therefore, some people tend to anthropomorphize technology [1]. This does not only work well in the field of Human-Robot interaction [9]: by attributing human characteristics to complex systems, people can make them more understandable; but users can even consider the interaction with computers social [18]. Not only technology, but also gamification mechanics applied in an eHealth domain can be cumbersome to understand. Similar to Vandenberghe and Slegers [31], we anticipate “*anthropomorphism to be an interesting approach for so-called generative techniques that aim to gather insights into people’s tacit knowledge and latent needs [32] that may be realized in future products or applications.*”

Based on this vision, we introduce the concept of ‘supercoaches’ - as an anthropomorphism for gamification mechanics - who aim to motivate users when they experience

issues adhering to their telemonitoring therapy. Using the concept of supercoaches, participants do not need to be familiar with technology, nor with gamification mechanics to discuss motivational strategies that might help overcome the issues the designers try to address. These supercoaches thus serve as an anthropomorphism for the actual gamification mechanics that designers want to implement in their system.

FOCUS GROUP PROTOCOL

Summary

The overall goal of the proposed focus group protocol is to determine: 1) which issues patients experience when they use a telemonitoring platform; 2) which motivational strategies are appropriate and which gamification mechanics are suitable to help patients adhere; and 3) how can we personalize and use the context to optimize the use of these mechanics.

The proposed protocol builds on the Anthropomorphism approach as proposed by Vandenberghe and Slegers [31]. Our protocol thus starts from the idea that users are tempted to humanize technology and software. This method introduces the metaphor of an all-knowing, omnipotent virtual ‘supercoach’ who can, and wants to, do everything to motivate patients. Thanks to this abstraction, patients might be stimulated to think about the future and ideal use of the telemonitoring platform, without having full insights into sensor or gamification mechanics, or personalization techniques such as recommender algorithms.

In each step of the focus group different cards are used: 1) the first card is used to list the issues participants experience when they are using the platform under evaluation (Figure 1A); 2) in the second step, a supercoach is introduced to help overcome the issue listed on the first card (Figure 1B); 3) feedback from the other group (patients vs. caregivers) is added using a third card (Figure 1C); 4) finally, this card trail is extended with gamification mechanics heavily based on Marczewski’s gamification inspiration cards [16]. However, for each mechanic we translated and adapted the text to the local language and searched for an appropriate example (see Figure 2 - for this paper, the original English text is used).

Practical

We aim to have six to eight patients and two to four caregivers participate in each 2-hour focus group session. It is important to have both patients and caregivers participate. In this way, potential boundaries between the two groups can be exposed. Each group is asked to write with a distinct color, to easily determine which feedback originates from which group. The focus group should be recorded, which will be used to transcribe the results. Privacy and security of the collected data should be saved according to local legislation.

Introduction

Time: 10 minutes

Setup and Explanation: Introduction to the concept.

In this focus group study, we want to determine how [application name] can motivate you to execute all operations and continue to perform them accurately. Over the next two hours, we will brainstorm on this topic using a specific method.

A

What does 97% mean?

I am not sure what 97% on my SpO2 meter means, is this good? Or is it bad?

What? Measure SpO2


Where? Home

When? In the morning

Who? Alone

Why? Curious

B

 Supercoach

The supercoach can show me a table which explains all possible SpO2 values

| Range | State | priority |
|--------|------------------|----------|
| < 64 | Error | 5 |
| 65-73 | High risk | 4 |
| 80-91 | Risk level | 3 |
| 92-94 | Discomfort level | 2 |
| 95-100 | Normal level | 1 |
| > 100 | Error | 5 |

C

What, how, and in which situation would you expect an answer?

How would you adapt the answer of this supercoach? What is not clear? What is your concern?

The table might be hard for some people to understand. I would suggest the supercoach to just mention that every value above 95% is ok.

Figure 1. A card trail. The top card (A) is used to document an issue a participant experienced. The middle card (B) is the supercoach who can help the participant to overcome the issue. The last card (C) is an additional viewpoint from the other group.

Imagine there is a supercoach at your disposal, an all-knowing, omnipotent supercoach who can always motivate you at the right time and who knows perfectly what to say and what to do. This supercoach wants to make it easier for you to perform your actions.

Potential Issues

Time: 15 minutes (5 minutes writing, 10 minutes discussion)

Setup and Explanation: Provide sample cards (see Figure 1A) participants can use to list potential issues they experienced.

You might already know [application name], so you might be familiar with the actions you need to do. In this first step, we want to determine a list of issues where you have difficulties with or where you want more information on. Possible questions are:

- Which actions do you find confusing?
- Which actions do you forget to apply?
- Which actions do you not understand?
- Which actions do you find annoying?
- Which actions have you already deliberately skipped?

We would like you to describe and explain this in a short sentence. Also try to provide additional information, where, when, with who, and why? So please do not just write “blood pressure” but elaborate: “when I come home and want to feed the dog, I find it hard to measure my blood pressure slowly.”

Examples:

- Yesterday, I forgot to measure my blood pressure. This often happens when I have to work late.
- It is boring to measure my oxygen. Why does it take so long before I can expel the SpO2 meter?
- I always forget what time I should measure my blood pressure again.

Supercoaches

Time: 20 minutes (10 minutes writing, 10 minutes discussion)

Setup and Explanation: Attach a supercoach (see Figure 1B) to an issue listed in the previous step.

Now choose a supercoach, and think how this supercoach could coach and motivate you? What could this supercoach say to you? What could the supercoach do for you? Why would this help you? How would this motivate you? You can now take a supercoach and write how this supercoach could coach and motivate you. When done, choose another issue.

Examples:

- Supercoach can explain that ‘97%’ represents an approximation of the amount of oxygen in your blood. He can also tell you that normal values fall between 95% and 100%.
- Supercoach can send you a message to measure your blood pressure when you are behind the TV and are sitting still anyway.
- Supercoach advises you not to watch the screen of the device anymore, so you do not focus on your heart rate.
- Supercoach can show you a screen with the timings you have measured your blood pressure.

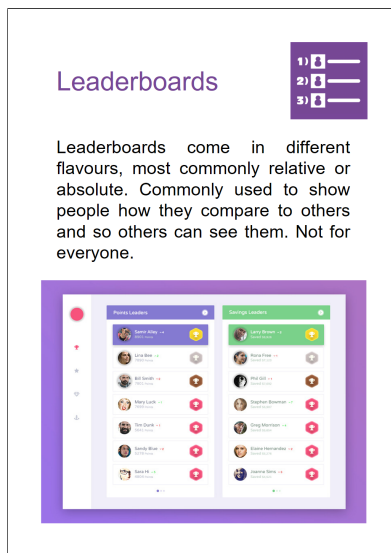


Figure 2. A sample gamification mechanics card that participants can choose. Text and icon from [17], leaderboard image from [5].

Switch roles

Time: 15 minutes (5 minutes writing, 10 minutes discussion)

Setup and Explanation: Ask feedback (see Figure 1C) on the supercoach from the other group (patients vs. caregivers). *We are now going to split the caregivers and patients temporarily into two groups. We ask to give the supercoaches to the other group so that you continue working on the other group's supercoaches. Take a card and think how the supercoach's response might look like for you. When, how and in what situation would you expect an answer? Is there anyone with you? Attach this new card to the supercoach.*

Examples:

- A video can be too stimulating and affect the results.
- Beware of the nocebo effect by showing too much information.

Gamification Mechanics

Time: 30 minutes (12 minutes explanation of gamification mechanics, 11 minutes writing, 7 minutes discussion)

Setup and Explanation: Introduce the gamification mechanics and allow participants to choose a gamification mechanic to attach to the card trail (as shown in Figure 1).

We are now moving to the penultimate phase. We will show you some mechanics that might motivate [application name] users. We are asking you to take some of these cards with proposals and then paste them on the card trail.

Examples:

- Earn a badge when you go to sleep on time.
- Earn experience points when you measure your blood pressure at a certain time.
- Show a leaderboard that shows how many users recorded their measurements correctly this week.
- Show a visualization that shows how well you are doing.
- Provide a clear goal in which you try to use the activity trackers at least during the weekdays.

Wrap-up

Time: 30 minutes (10 minutes dot-voting, 20 minutes discussion)

Setup and Explanation: Dot-voting.

We now have many supercoaches full of comments and ideas. In this final step, we will sort these supercoaches. Please look at all the supercoaches and observe what has been written down. Everyone gets five stickers that you can divide over what you think is the most relevant issue and solution. You also get one veto sticker for something you really do not want. On a veto sticker, you will need to write your initials or name so that we can ask you for more explanation. You will get ten minutes to do this, after which we will discuss this further.

DISCUSSION ON USER TYPES

Although this proposed focus group protocol might help to select an initial set of gamification mechanics, there is still a need for added intelligence to adapt to user profiles [29]. Moreover, there are contexts in which users may be less inclined or simply unable to follow up on certain gamification mechanics. It simply might not be the right place or time to follow up on a challenge or start a competition.

There are multiple frameworks available that help to determine the users' type [3, 14, 24]. A well-known example is the Hexad framework [15] of which Tondello et al. [30] "created a 24-items survey response scale to score users' preferences towards the six different motivations in the Hexad framework." Marczewski [15] suggests different game mechanics that may support different user types. Orji et al. [20] "reveal that people's personality traits play a significant role in the perceived persuasiveness of different strategies."

A potential extension to our protocol is to measure the participants personality. Participants might be asked to complete a short Big Five test [23]. In the focus group, this test could be a survey. However, in the eventual implementation this could be automated. For example, by linking social media profiles of the user [10].

CONCLUSION AND FUTURE WORK

In this position paper, we proposed a protocol that can be used to select suitable gamification mechanics in an eHealth context. We make use of the tendency of people to anthropomorphize technology, which makes it easier for participants to brainstorm on issues and, more importantly, on motivational design techniques such as gamification mechanics.

We are scheduling multiple focus groups with pain patients who are asked to use a telemonitoring platform for 10 weeks after their operation. Although we focus on telemonitoring actions in our work, we do see an added value of our work for the related well-being and flourishing domains. For example, it might be hard for people to report on gamification mechanics that might motivate them to become more autonomous or pursue additional personal growth. However, using this proposed 'supercoach' protocol, participants do not need to be aware of these gamification mechanics before they can start the discussion.

ACKNOWLEDGMENTS

We would first like to acknowledge Marczewski as this work depends heavily on his gamification inspiration cards [16]. We would also like to thank the project partners and medical staff from the pain center who provided feedback on this proposed protocol. This work is part of the research project PANACEA Gaming Platform with project number HBC.2016.0177, which is financed by Flanders Innovation & Entrepreneurship (in Dutch: Agentschap Innoveren & Ondernemen).

REFERENCES

1. R John Brockmann. 1997. A Homunculus in the Computer? *Journal of Technical Writing and Communication* 27, 2 (1997), 119.
2. Martha Ann Carey and Jo-Ellen Asbury. 2016. *Focus Group Research*. Routledge.
3. Yu-Kai Chou. 2016. *Actionable gamification: Beyond points, badges, and leaderboards*. Octalysis Group.
4. Bateman Chris, Lowenhaupt Rebecca, and Nacke Lennart. 2011. Player Typology in Theory and Practice. In *DiGRA '11 - Proceedings of the 2011 DiGRA International Conference: Think Design Play*. DiGRA/Utrecht School of the Arts.
5. Muzli design inspiration. 2016. Leaderboard UI Inspiration. https://cdn-images-1.medium.com/max/1600/1*3nCYmSHqJiBqow2bvKYmBA.png. (2016). Accessed: 2017-8-4.
6. Economist Intelligence. 2015. *Power to the patient: How mobile technology is transforming healthcare*. Technical Report.
7. G Eysenbach. 2001. What is e-health? *J. Med. Internet Res.* 3, 2 (April 2001), E20.
8. Gunther Eysenbach. 2005. The law of attrition. *J. Med. Internet Res.* 7, 1 (31 March 2005), e11.
9. Friederike Eyssel, Dieta Kuchenbrandt, and Simon Bobinger. 2011. Effects of anticipated human-robot interaction and predictability of robot behavior on perceptions of anthropomorphism. In *Proceedings of the 6th international conference on Human-robot interaction*. ACM, 61–68.
10. Golnoosh Farnadi, Geetha Sitaraman, Shanu Sushmita, Fabio Celli, Michal Kosinski, David Stillwell, Sergio Davalos, Marie-Francine Moens, and Martine De Cock. 2016. Computational personality recognition in social media. *User Modeling and User-Adapted Interaction* 26, 2 (01 Jun 2016), 109–142.
11. Zachary Fitz-Walter, Dian Tjondronegoro, and Peta Wyeth. 2011. Orientation Passport: using gamification to engage university students. In *Proceedings of the 23rd Australian Computer-Human Interaction Conference*. ACM, 122–125.
12. J Hamari, J Koivisto, and H Sarsa. 2014. Does Gamification Work? – A Literature Review of Empirical Studies on Gamification. In *2014 47th Hawaii International Conference on System Sciences*. 3025–3034.
13. Daniel Johnson, Sebastian Deterding, Kerri-Ann Kuhn, Aleksandra Staneva, Stoyan Stoyanov, and Leanne Hides. 2016. Gamification for health and wellbeing: A systematic review of the literature. *Internet Interventions* 6 (1 Nov. 2016), 89–106.
14. Dennis L Kappen and Lennart E Nacke. 2013. The kaleidoscope of effective gamification: deconstructing gamification in business applications. In *Proceedings of the First International Conference on Gameful Design, Research, and Applications*. ACM, 119–122.
15. Andrzej Christopher Marczewski. 2015. *Even Ninja Monkeys Like to Play: Gamification, Game Thinking and Motivational Design*. CreateSpace Independent Publishing Platform.
16. Andrzej Christopher Marczewski. 2017a. Gamification Inspiration Cards. <https://www.gamified.uk/gamification-inspiration-cards/>. (2017). Accessed: 2017-8-4.
17. Andrzej Christopher Marczewski. 2017b. Gamification Mechanics Elements. <https://www.gamified.uk/user-types/gamification-mechanics-elements>. (2017). Accessed: 2017-8-4.
18. Clifford Nass, Jonathan Steuer, and Ellen R Tauber. 1994. Computers Are Social Actors. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '94)*. ACM, New York, NY, USA, 72–78.
19. Rita Orji, Regan L Mandryk, Julita Vassileva, and Kathrin M Gerling. 2013. Tailoring Persuasive Health Games to Gamer Type. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '13)*. ACM, New York, NY, USA, 2467–2476.
20. Rita Orji, Lennart E. Nacke, and Chrysanne Di Marco. 2017. Towards Personality-driven Persuasive Health Games and Gamified Systems. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*. ACM, New York, NY, USA, 1015–1027.
21. Guy Paré, Mirou Jaana, and Claude Sicotte. 2007. Systematic review of home telemonitoring for chronic diseases: the evidence base. *J. Am. Med. Inform. Assoc.* 14, 3 (May 2007), 269–277.
22. PriceWaterHouseCooper Global Health Unit. 2014. *Emerging mHealth: Paths for growth*. Technical Report. pwc.
23. Beatrice Rammstedt and Oliver P John. 2007. Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *J. Res. Pers.* 41, 1 (1 Feb. 2007), 203–212.
24. Torsten Reiners and Lincoln C Wood. 2014. *Gamification in Education and Business*. Springer International Publishing.

25. Jane Ritchie, Jane Lewis, Professor of Social Policy, Carol McNaughton Nicholls, and Rachel Ormston. 2013. *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. SAGE.
26. Michael Sailer, Jan Hense, Heinz Mandl, and Markus Klevers. 2013. Psychological Perspectives on Motivation through Gamification. *IxD&A* 19 (2013), 28–37.
27. Sepandar Sepehr and Milena Head. 2013. Competition As an Element of Gamification for Learning: An Exploratory Longitudinal Investigation. In *Proceedings of the First International Conference on Gameful Design, Research, and Applications (Gamification '13)*. ACM, New York, NY, USA, 2–9.
28. David W Stewart, Prem N Shamdasani, and Dennis Rook. 2006. *Focus Groups: Theory and Practice (Applied Social Research Methods)* (2nd edition ed.). SAGE Publications, Inc.
29. Gustavo F Tondello, Rita Orji, and Lennart E Nacke. 2017. Recommender Systems for Personalized Gamification. In *Adjunct Publication of the 25th Conference on User Modeling, Adaptation and Personalization*. ACM, 425–430.
30. Gustavo F Tondello, Rina R Wehbe, Lisa Diamond, Marc Busch, Andrzej Marczewski, and Lennart E Nacke. 2016. The Gamification User Types Hexad Scale. In *Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play*. ACM, 229–243.
31. Bert Vandenbergh and Karin Slegers. 2016. Anthropomorphism as a Strategy to Engage End-Users in Health Data Ideation. In *Proceedings of the 9th Nordic Conference on Human-Computer Interaction*. ACM, 18.
32. Froukje Sleeswijk Visser, Pieter Jan Stappers, Remko van der Lugt, and Elizabeth B-N Sanders. 2005. Contextmapping: experiences from practice. *CoDesign* 1, 2 (1 April 2005), 119–149.