Gamification in MOOC to enhance users' goal achievement

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Outline

- Gamification and MOOCs
- Problem to address
- The Personal Goal Achievement Ratio (PGAR) and the Overall Goal Achievement Ratio (OGAR)
- Our assumption
- Research questions
- Action Plan
- Conclusion and Next steps

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Gamification and MOOCs

- "Gamification is the use of game elements in a non-game scenario" to solve problem/s (Deterding, et al., 2011)

- MOOCs are are modern educational opportunities, which use the Internet to scale up in participants and to reach massive audiences (Pappano, 2012)

- Problem: how can they benefit from each others?

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Problem to address in MOOC via a Gamified Approach

Completion Rate in MOOC- presented and study as relative to learners' intention (goal achievement)

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Reconsider MOOC Completion Rates: User Intention

- Completion in MOOC: number of certificate earns divided by the total number of people registered for a course →Completion Rate (*CR)* = $\frac{ncom}{nreg}$

- Using the user intention lens we have another picture for MOOC success

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1- Completion Rate in MOOC
Study related to learners' intention

- From Reich (2014) we can derive:

    1. users who state to "intend to earn a certificate" show a higher completion rate compared to those who declare to intend to "browse the MOOC", in accordance with the implementation intention theory

    2. even MOOC learners that declare the intention to earn a certificate, only 22% (of 58%) achieved their goal, the rest (36%) fails to do so. These findings suggest an "intention behaviour gap" for those remaining 36%, which denotes the discrepancy between an intention and the action taken by a person

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Intention-Behaviour Gap

"Although some people may develop an intention to change their behaviour, they might not take any action. This discrepancy has been labelled the intention–behaviour gap''. (Sniehotta, et al., 2005, p.146)

Implementation Intention Theory

"By planning, persons develop a mental representation of a suitable future situation (''when'' and ''where'') and a behavioural action (''how''), which is expected to be effective for the goal pursuit to be performed in that situation" (Sniehotta, et al., 2005)

"people who furnish their goal intention with implementation intention should be comparatively more successful in goal achievement" (Gollwitzer, 1993; Gollwitzer, 1999;Gollwitzer & Sheeran, 2006).

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The Personal Goal Achievement Ratio (PGAR) and the Overall Goal Achievement Ratio (OGAR) (1)

- Traditional Completion Rate definition:

$$\rightarrow CR = \frac{ncom}{nreg}$$

- the Personal Goal Achievement Ratio (PGAR) is defined as the Personal Completion Ratio (PCR, i.e. the percentage of the course completed by the user) divided by the User Intention Ratio (UIR, i.e. the percentage of the course intended to be completed by the user)

$$\rightarrow PGAR = \frac{PCR}{UIR}$$

The Personal Goal Achievement Ratio (PGAR) and the Overall Goal Achievement Ratio (OGAR) (2)

- Overall Goal Achievement Ratio (OGAR) is defined as the mean of all PGAR values for all registered users

$$\rightarrow OGAR = \frac{1}{n}\ \Sigma(PGAR)$$

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Our assumption

Our assumption is that by using game design patterns such as "Stimulated Planning" in MOOCs, users will be enable to apply the implementation intention and have higher chance od achieve their goals.

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Research Questions (1)

Q1. Which are the GDP that can have effects on the variable (goal achievement) if transferred in MOOC environments?

Q2. How can these selected GDP be described and classified according to their characteristics?

Q3. How can MOOCs be designed to implement the GDP identified?

Q4. What are the effects that the selected GDP have on goal achievement of MOOC learners (variable)?

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Research Questions (2)

Q5. Which factors mediate these effects (if any)?

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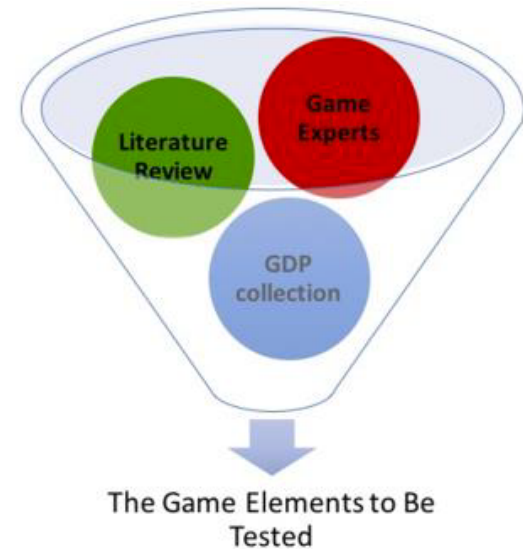Alessandra Antonaci
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Action Plan: how do we want to select the game elements?

- Literature Review: identify the most used game elements

- Collection of Game Design Patterns from Björk & Holopainen: identification of additional patterns

- Game Design Experts: focus group to identify and rate the selection

Literature Review

Game Experts

GDP collection

The Game Elements to Be Tested

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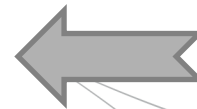**Open Universiteit**
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Conclusion and Next Steps

- How MOOCs can benefit from Gamification has been clarified

- A new lens to look at completion rate has been presented

- The Literature Review has been done
- Game Design Patterns form Björk and Holopainen has been selected
- Focus Group with experts has been conducted

A Convincing Experiment

Dr. Sabouraud of the Pasteur Institute, Paris, France, inoculated a rabbit with human dandruff germs, and "in between five and six weeks," says the official report of the Pasteur Institute, "the rabbit was completely denuded, in fact it had become entirely bald."

This experiment proves that dandruff is a contagious disease due to the presence of a microbic growth in the sebaceous glands of the scalp. It also proves that unless the formation of dandruff is stopped—by destroying the dandruff germ—that it will lead to falling hair and incurable baldness.

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References

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From Game Design Elements to Gamefulness: Defining "Gamification." Proceedings of the 2011 Annual Conference Extended Abstracts on Human Factors in Computing Systems- CHIEA '11, 2425. http://doi.org/10.1145/1979742.1979575

L. Pappano, "The Year of the MOOC," The New York Times, 2012. [Online]. Available: http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?pagewanted=all&_r=0. [Accessed: 02-Nov-2012].

Reich, J. (2014). Learner Intention Recasts "Low" MOOC Completion Rates | HarvardX. Retrieved February 29, 2016, from http://harvardx.harvard.edu/news/learner-intention

Sniehotta, F. F., Scholz, U., & Schwarzer, R. (2005). Bridging the intention–behaviour gap: Planning, selfefficacy, and action control in the adoption and maintenance of physical exercise. Psychology & Health, 20(2), 143–160. http://doi.org/10.1080/08870440512331317670

Gollwitzer, P. M. (1993). Goal Achievement: The Role of Intentions. European Review of Social Psychology, 4(1), 141–185. http://doi.org/10.1080/14792779343000059

Gollwitzer, P. M. (1999). Implementation intentions. American Psychologist, 54(7), 493–503.

Gollwitzer, P. M., & Brandstätter, V. (1997). Implementation intentions and effective goal pursuit. Journal of Personality and Social Psychology, 73(1), 186–199. http://doi.org/10.1037/0022-3514.73.1.186

Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: A meta-analysis of effects and processes. Advances in Experimental Social Psychology, 38, 69–119. http://doi.org/10.1016/S0065-2601(06)38002-1

Cook, S., Bingham, T., Reid, S., & Wang, L. (2015). Going massive: Learner engagement in a MOOC environment.

Björk, S., & Holopainen, J. (2005). Patterns in Game Design. CHARLES RIVER MEDIA, INC.

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Thank you!

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