INFOMSCIP 2019-2020
lecture 13
Oct 17, 2019

In game research, we are often interested in:

- Evaluating 'bigger', more complex systems (i.e., full games)
- Evaluating 'softer', more vague characteristics (e.g., experience)

Doing this scientifically is hard, but not impossible.

In the following, we will look at:

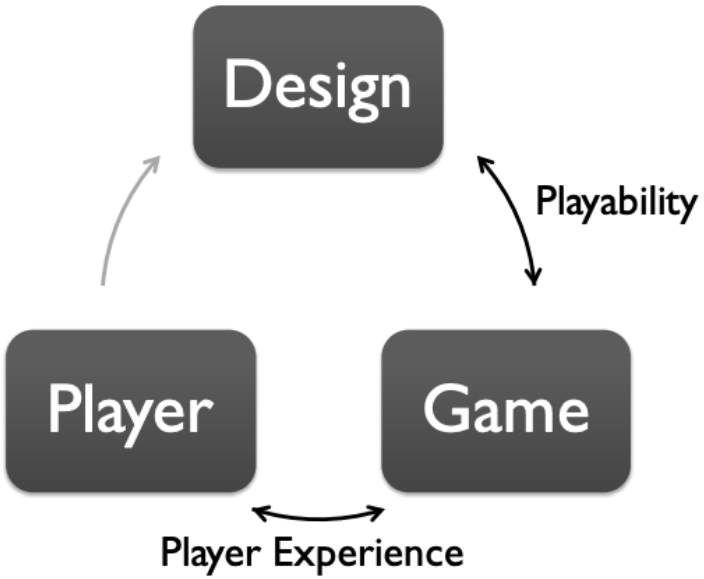
- **Approaches to quantify these vague characteristics**
- Some questionnaires used to measure them
- Some examples

L. Nacke et al. (2009). Playability and player experience research. In *Proceedings of DiGRA 2009: Breaking new ground: Innovation in games, play, practice and theory*. http://www.diva-portal.org/smash/get/diva2:835637/FULLTEXT01.pdf

Defines **gameplay** as the gaming process of the player with the game.

Authors distinguish between:

- **Playability:** the evaluative process directed towards games
- **Player experience:** is directed towards the player



Approaches to measure playability:

- Expert reviews or heuristics (specifically designed for games)

Authors propose **a combined approach to measure experience**:

- Biometrics (EMG, EDA, EEG, …)
- Gameplay metrics (numerical data obtained from user interaction with game software)
- Player-based feedback

Integration of qualitative methods is essential to answer the *why*, not just the *what* of player behavior.

⇒ Establishment of **standardized questionnaires**

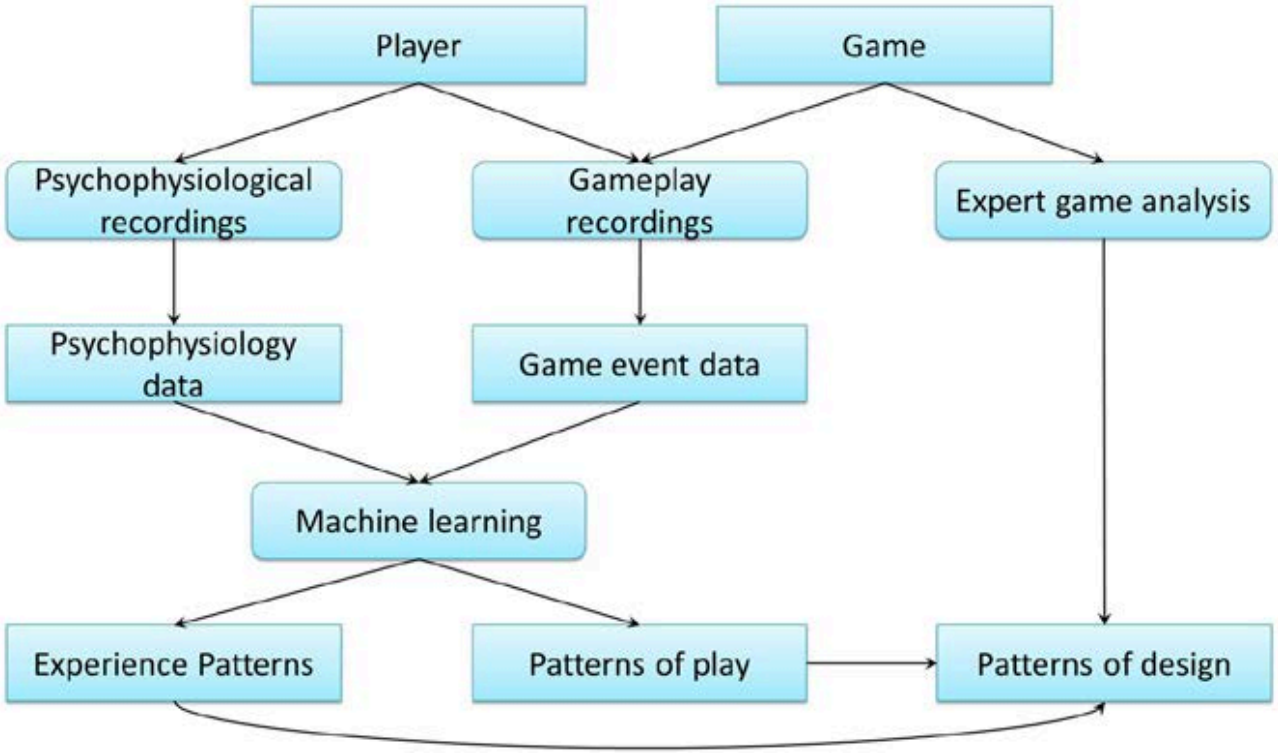
B. Cowley et al. (2014). Experience assessment and design in the analysis of gameplay. *Simulation & Gaming*, *45*(1), 41-69.
https://journals.sagepub.com/doi/pdf/10.1177/1046878113513936

Problem:

- Psychophysiological data offers valuable information for assessing, quantifying, and testing player experience in support of game design
- Yet, the information gained is determined by the analytical framework used to describe, annotate, and group the activities of play

Solution:

Authors propose a larger framework that uses machine learning to combine **psycho-physiological recordings** with **gameplay recordings** and complement this data with **expert game analysis** (qualitative measures)



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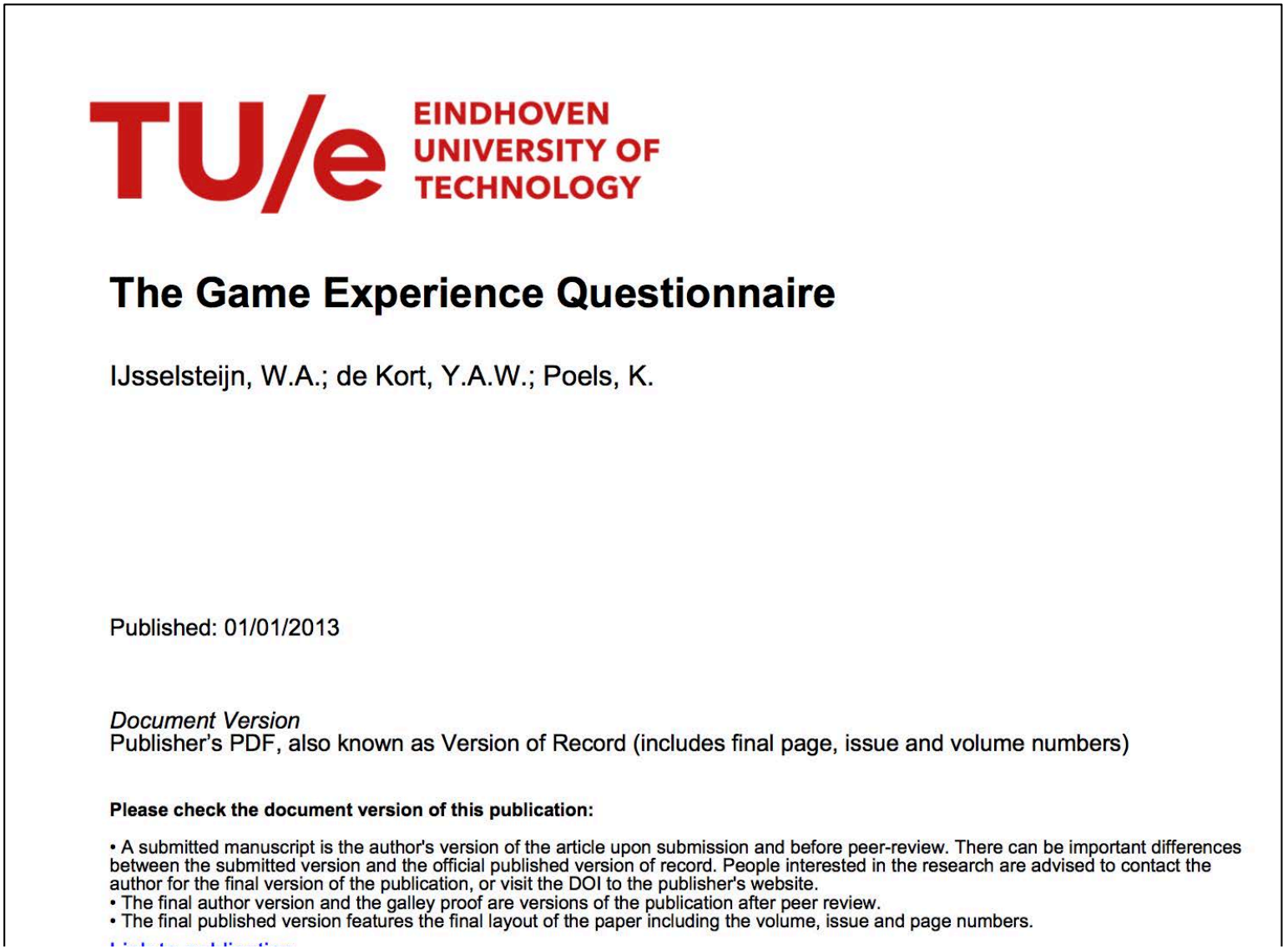
Game experience:
The Game Experience Questionnaire (GEQ)

https://research.tue.nl/en/publications/the-game-experience-questionnaire



TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

The Game Experience Questionnaire

IJsselsteijn, W.A.; de Kort, Y.A.W.; Poels, K.

Published: 01/01/2013

Document Version
Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

Game experience:
The Game Experience Questionnaire (GEQ)

Contains ***three modules***:

1. The core questionnaire
2. The social presence module

→ Probe feelings and thoughts while playing the game

3. The post-game module → Assesses how players felt after they stopped playing

Administered immediately after the game-session has finished.

In-game version (concise version of the core questionnaire) for probing in-game experience multiple times during a gaming session.

Game experience:
The Game Experience Questionnaire (GEQ)

Part 1: core part of GEQ

Assesses game experience as scores on seven components:

1. Immersion
2. Flow
3. Competence
4. Positive affect
5. Negative affect
6. Tension
7. Challenge

Five items per component

Please indicate how you felt while playing the game for each of the items,

on the following scale:

not at all	slightly	moderately	fairly	extremely
0	1	2	3	4
< >	< >	< >	< >	< >

1	I felt content
2	I felt skilful
3	I was interested in the game's story
4	I thought it was fun
5	I was fully occupied with the game
6	I felt happy
7	It gave me a bad mood
8	I thought about other things

Game experience:
The Game Experience Questionnaire (GEQ)

Part 2: the social presence module

Investigates psychological and behavioral involvement of the player with other social entities, including:

- Virtual (i.e., in-game characters)
- Mediated (e.g., others playing online)
- Co-located

Only administered when at least one of these types of co-players were involved in the game.

Please indicate how you felt while playing the game for each of the items, on the following scale:

not at all	slightly	moderately	fairly	extremely
0	1	2	3	4
< >	< >	< >	< >	< >

1 I empathized with the other(s)
2 My actions depended on the other(s) actions
3 The other's actions were dependent on my actions
4 I felt connected to the other(s)
5 The other(s) paid close attention to me

Game experience:
The Game Experience Questionnaire (GEQ)

Part 3: the post-game module

Assesses how players felt after they had stopped playing.

Relevant for assessing naturalistic gaming
(i.e., when gamers have voluntarily decided to play).

But may also be relevant in experimental research.

Please indicate how you felt after you finished playing the game for each of the items, on the following scale:

not at all	slightly	moderately	fairly	Extremely
0	1	2	3	4
< >	< >	< >	< >	< >

1 I felt revived
2 I felt bad
3 I found it hard to get back to reality
4 I felt guilty
5 It felt like a victory
6 I found it a waste of time

Game experience:
The Game Experience Questionnaire (GEQ)

Let's have a quick look at the questionnaire:

https://research.tue.nl/en/publications/the-game-experience-questionnaire

https://pure.tue.nl/ws/files/21666907/Game_Experience_Questionnaire_English.pdf

The Game Experience Questionnaire

W.A. IJsselsteijn, Y.A.W. de Kort, K. Poels

And on how they created it:

https://research.tue.nl/en/publications/d33-game-experience-questionnaire-development-of-a-self-report-me

https://research.tue.nl/files/21666952/Fuga_d3.3.pdf

D3.3 : Game Experience Questionnaire: development of a self-report measure to assess the psychological impact of digital games

K. Poels, Y.A.W. de Kort, W.A. IJsselsteijn

Some other examples

J. H. Brockmyer et al. (2009). The development of the Game Engagement Questionnaire: A measure of engagement in video game-playing. *Journal of Experimental Social Psychology, 45*(4), 624-634.

https://www.researchgate.net/publication/271357290_The_Development_of_the_Game_Engagement_Questionnaire_A_Measure_of_Engagement_in_Video_Game_Playing_Response_to_Reviews

A questionnaire to measure **game engagement** in relation to violent video games.

Hint: when using such standardized questionnaires, always look up the original work and verify, e.g., the **context** in which this questionnaire has been created.

Some other examples

R. Eppmann et al. (2018). Gameful Experience in Gamification: construction and validation of a Gameful Experience Scale [GAMEX]. *Journal of Interactive Marketing, 43,* 98-115.

https://link.springer.com/content/pdf/10.1007%2Fs11257-019-09223-w.pdf

A questionnaire to measuring users' **gameful experience** while using a service (in the context of gamification).

Note: the paper also contains a nice **overview of various approaches** (in Table 1) that could be helpful when picking an approach for your assignment.

Some other examples

L. Nacke et al. (2010). Gameplay experience testing with playability and usability surveys–An experimental pilot study. In *Proceedings of the Fun and Games 2010 Workshop, NHTV Expertise Series* (Vol. 10).

http://hci.usask.ca/uploads/199-Playability-submission.pdf

A pilot study about how to test **gameplay experience** using a combination of characteristics:

- ***Gameplay experience***
  (measured with the Gameplay Experience Questionnaire, GEQ)
- ***Usability information***
  (measured via the System (Game) Usability Scale, SUS)
- ***Player quality indicators***
  (measured via playtime and frequencies during a 3-week period)

Although just a pilot study, this is a nice example on how the combination of different measures might lead to better insight.

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K. M. Gerling et al. (2011). Measuring the impact of game controllers on player experience in FPS games. In *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments* (pp. 83-86). ACM.

http://hciweb.usask.ca/uploads/236-MindTrek-2011---Controllers-in-FPS-Games---Gerling-Klauser-Niesenhaus.pdf

Comparing input controller (mouse and keyboard versus gamepad control) using:

- The **Gameplay Experience Questionnaire (GEQ)** to measure *competence, flow, negative affect, positive affect, challenge, tension, immersion*
- The **Game Engagement Questionnaire (GEnQ)** to measure *immersion, presence, flow, absorption*
- The **ISO-Norm Questionnaire 9241/10** to investigate *usability issues*
- Basic player **performance metrics**: *number of deaths, level completion*

Hypotheses:

1. The hardware interface influences the player's experience and efficiency
2. Player efficiency has an impact on player experience
3. Using one's comfort platform will influence player experience

C. Yildirim, M. Carroll, D. Hufnal, T. Johnson and S. Pericles, "Video Game User Experience: To VR, or Not to VR?," *2018 IEEE Games, Entertainment, Media Conference (GEM)*, Galway, 2018, pp. 1-9.

http://cs.oswego.edu/~caglar/publications/VideoGameUX_IEEEGEM18.pdf

Comparing gaming platform / display (desktop computer screen, Oculus Rift, HTC Vive) using:

- Subjective sense of presence, measured using the ***Presence Scale***
- Level of self-reported game UX satisfaction using the ***Game User Experience Satisfaction Scale***