

Educational Gaming and Situational Interest for Higher Education Students

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Abstract: InPraktijk is an educational game developed for first year physical therapy students. The game aims to use playful learning to optimize students' interest in interacting with course content. This project is a first step in achieving a versatile educational game platform optimized for engaging, playful learning that can be applied across multiple educational programmes. The project seeks to improve students' motivation to engage with course materials outside of class time and explore the relationship between playful learning and situational interest. Our research is focused on a deeper understanding of the relationship between situational interest and playful learning. The InPraktijk game, developed in collaboration with Game Tailors, will be used as a tool to test this relationship. Through the game, we will collect quantitative data on time played, drop out location and situational interest using the situational interest scale. This work in progress paper covers the design for study 1 of the InPraktijk project. The study indicates whether the gamified interaction with course content can generate more situational interest compared to traditional content delivery methods. The results will provide insights into the effectiveness of the InPraktijk app in stimulating situational interest. Our findings will guide the direction of follow-up studies on further game optimization and the integration of playful games in educational structures.

Keywords: Serious games, games-based learning, playful learning, situational interest

1. Introduction

In higher education, motivation is a necessary element that stimulates and maintains successful learning (Sogunro, 2015). Game elements focused on harnessing the power of students' intrinsic motivation can help ensure that students stay interested and engaged with their course content (Konetes, 2010). Additionally, playful learning can help generate excitement, enjoyment, and interest in the learning process for higher education students (Rice L., 2009). Interest is a psychological state that has a positive relation with learning outcomes in the context of educational games (Koskinen, et al., 2022). Through this project, we develop and test a game that intends to stimulate students' situational interest in study-related learning materials. Situational interest can be defined as the motivation to engage (Silvia, 2008), or the motivational state students experience when engaging with a task (Schraw, Flowerday, & Lehman, 2001).

InPraktijk is an educational game that uses playful learning and game elements with the aim of increasing students' situational interest, or motivation to engage with their course materials. InPraktijk is an educational game designed for physical therapy students at the Utrecht University of Applied Sciences (HU) in collaboration with Game Tailors, a serious game development company located in the Netherlands. It focuses on harnessing students' intrinsic motivations to become physical therapy professionals to trigger situational interest in the educational game. Using the InPraktijk game as a tool, this research aims to explore the relationship between situational interest and educational gaming in higher education students. The focus is on providing interactive content that triggers situational interest through playful learning, creating an environment that resembles practical application or "InPraktijk". The goal of this iterative study is to achieve measurable improvements in students' motivation to engage with course material via the InPraktijk game.

The game is a mobile application that simulates a physical therapy practice: students portray the role of a physical therapy intern and have to treat patients by completing patient cases. When entering the app there are patients waiting in the waiting room, students must then begin the medical history conversation with the patient. Students are given multiple choice options for how to continue the conversation, if they choose the wrong option the assistant provides tips as to why this may not be the best choice. Throughout the conversation small exercises may appear, such as organizing the varied factors influencing the patient in the right category (social, cognitive, emotional).

2. Related Work

2.1.1 *Situational interest formation*

Situational interest can be understood as the appealing effect of an activity on an individual, as opposed to the individual's personal preference for the activity, or their individual interest (Hidi & Anderson, 1992). Situational interest was later defined by Hidi (2001) as a short-term psychological state triggered by something in the immediate environment. According to Schiefele (2009), triggering situational interest can facilitate intrinsic motivation to learn more about a subject. However, according to Rodríguez-Aflecht et.al. (2018), triggering situational interest without maintaining it can actually have negative long-term effects on individual interest. This makes the relationship between situational interest, individual interest, and intrinsic motivation complex.

2.1.2 *Situational interest in educational games*

Situational interest is a motivational construct that can be related to students' engagement in game-based learning (Kiili et.al., 2021). According to a study by Kosiken et.al. (2022), in the context of educational games, situational interest and learning are positively related. While game-based learning is expected to increase students' situational interest (Plass, Homer, & Kinzer, 2015), a study by Rodríguez-Aflecht et.al., showed that educational gaming environments may only trigger situational interest in students who are already interested in the subject before the game-based intervention (2018). Again, highlighting the complexity of the relationship between situational interest and educational games.

Plass et. al. (2015), reviewed the psychological foundations of game-based learning and noted the additional complexity of intrinsic motivation and situational interest in the context of game-based learning. They discuss how students may be intrinsically motivated to play the game but not to learn the content, therefore, when designing educational games, it is crucial to tightly link learning and game mechanics. Csikszentmihalyi's concept of flow- a state of complete absorption in an activity (1975) can also be used when discussing playful learning or gaming. Flow is a state of peak enjoyment, energetic focus, and creative concentration (Csikszentmihalyi, 1975). According to a study by Kiili et.al., (2021), situational interest and flow share similar components, however, they are independent constructs. For this study we will focus on the concept of situational interest, however; the relevance of Csikszentmihalyi's concept of flow should be mentioned. There is still a lot that is unknown about the relationship of situational interest and intrinsic motivation in the context of educational games. This study attempts to explore this relationship through the use of the InPraktijk game.

3. Study design

The aim of this study is to assess whether the gamified delivery of course content generates more interest compared to traditional methods, such as static cases. To measure this, all first-year physical therapy students at the Utrecht University of Applied Sciences (HU) in academic year 2024-2025 ($n \approx 200$) will be invited to participate in a study. The InPraktijk game will be introduced to half of the students, and the other half (control group) will interact with the same content/ cases via a static format that does not utilize playful learning. The students will be instructed to participate in the study over the course of the first block of the semester, ± 8 weeks. The study set-up will first be piloted with a group of $n=10$ UX researchers to optimize the study design and identify any usability issues in the game and $n=10$ physical therapy teachers to identify any potential content issues.

The following research question is guiding this study; *Does physical therapy students' situational interest in the course content increase when interacting with the InPraktijk game as opposed to a static content delivery method?*

- Is there a difference in situational interest between the control group and InPraktijk app user groups?
- Does the students' level of situational interest correlate with the number of cases they complete?

3.1.1 *Methodology*

Study 1 consists of two groups, a test group (Students use the InPraktijk app to interact with the patient cases) and a control group (students receive the patient cases in a static online format). Teachers will be instructed on how to introduce students to the cases during class time, they will be given standardized prompts to reduce potential bias amongst classes. Students will be randomly placed in either the control or the test group.

3.1.2 *Data collection and analysis*

Situational interest is measured using the Situational Interest Scale (Rotgans & Schmidt, 2014). Situational interest will be measured at five points throughout the game, after a designated amount of playtime. Qualitative data on students' interest formation, game-play experience and intrinsic motivation will be collected via semi-

structured interviews after the test period. Quantitative user data is collected on player activity in the following ways:

- *Time played*- A player's activity is measured per second of playtime. If the player closes the app (soft close) this is considered inactivity.
- *Login attempts*- A login attempt is only measured when actual gameplay occurs. If a user logs in and does not complete any tasks, then this is not registered.
- *Drop out location*- Captures the last active location in the app for students who leave the app.
- Shows the last mission played, when it was, and how long they spent on it.
- Shows if a mission has been started and completed.

Students from the test group and control group will be interviewed using semi-structured interviews to uncover qualitative data behind students' motivation and interest regarding the content and content delivery methods. The interviews aim to discover how students interact with the game, what they enjoyed, and whether they are intrinsically motivated to continue playing the game.

Study 1 aims to uncover the following insights using the Situational Interest Scale in combination with InPraktijk player data:

- By conducting a T Test analysis, we will determine if situational interest (measured using the Situational Interest Scale) is higher with the InPraktijk app than with the control group
- Using the Pearson Correlation Coefficient (r) we will determine if the students' level of situational interest correlates with the number of cases they complete.
- Using the Pearson Correlation Coefficient (r) we will examine if the time students spend in the app correlates with their interest, as measured by the Situational Interest Scale.

4. Conclusion

The results from this study will help uncover insights into the relationship of playful learning and situational interest for higher education students. The study will also determine whether the InPraktijk app adds value by enhancing students' situational interest in comparison to traditional content delivery methods. This information will guide decisions on the potential integration and improvement of the InPraktijk game in educational settings. By leveraging playful learning elements and game mechanics, the project aims to stimulate situational interest, thereby facilitating a deeper connection with course materials. Insights gained from this research will inform the ongoing evolution of educational gaming platforms and holds promise for broader applications across diverse educational programs.

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