




# Increasing Reading Engagement for Danish Gymnasium Students: *The Hosier and His Daughter* as a Serious Game

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**Abstract.** This study outlines how a serious game was implemented using transmedia storytelling to engage students in a Danish gymnasium when reading the mandatory novella *The Hosier and His Daughter*, written by the Danish author St. St. Blicher in 1829. The study is based on 52 students from two gymnasium Danish classes. The study's novelty and importance lie in its focus on using a participatory design approach to involve the teachers as co-designers at a very early stage. The transmedia setup was based on the following procedure: read seven pages of the story in the textbook, play seven pages as a game that includes reading and voice-overs and then read the rest of the story in the textbook. A formative evaluation was administered using a questionnaire after the first reading and after the gameplay. Furthermore, there were in-depth interviews with both teachers and students. The findings indicate that the serious game improved reading engagement, leading to much higher immersion levels, ease of reading and enjoyment of reading the story. The story in the game was well told, and the learning outcome was achieved through increased engagement.

**Keywords:** Reading engagement · Serious game · Transmedia storytelling · Co-designers

## 1 Introduction

This study was aimed at using serious gaming as an approach to engaging students enrolled at Ørestad Gymnasium (Copenhagen) in reading Steen Steensen Blicher's 1829 novella *The Hosier and His Daughter* (*Hosekræmmeren*) [1]. The story resembles that of *Romeo and Juliet* in that it involves young star-crossed lovers who cannot be together and ends in tragedy. The story employs poetic realism, but it is not easy to read. This is partially due to its early-nineteenth-century wording and writing style, but its complexity mainly arises from the story's narration, which presents potential barriers to reading engagement. A traveler who has no connection with the characters in the novella narrates the story. This disconnect between narrator and story can make it difficult for the reader

to engage with the story. The novella has therefore become notorious as one of the most boring and tedious texts in the mandatory Danish gymnasium curriculum.

This study's research question was as follows: Can a serious game be designed to increase reading engagement in St. St. Blicher's novella *The Hosier and His Daughter* as part of the mandatory reading in Danish literature classes at Ørestad Gymnasium?

Reading fiction is positively associated with higher performance on reading assessments [7]. However, in recent decades, students have changed their habits; they now read less fiction and spend more time reading online than before [2–4]. In Denmark, 20% of young adults do not read fiction [6], which is in line with other international reports [4, 7]. On average, across OECD countries, 37% of students report that they do not read for enjoyment at all [7]. Reading has always been encouraged through complex and diverse practices. However, there is considerable concern that young adults do not read well enough to cope with the increasing literacy demands of an information society [3–5]. Reading is a skill with many graduations of proficiency, and reading a rather complex novella from 1829 requires a different level of reading ability than, for example, reading a newspaper or subtitles on Netflix, making the former task challenging for many students [3–5]. If students read less fiction, they could lack familiarity with national literature of historical importance. In Danish gymnasiums, male students struggle more with reading engagement compared to female students [10]. This lack of reading engagement may partly explain why male students in particular lag behind compared female students in Danish gymnasiums, a fact that poses challenges for male students in terms of later educational opportunities and access to the labor market [8, 9]. In Danish gymnasiums, the average grade difference is 0.5 points (based on 7-point grading scale) in favor of female students [9]. However, in Danish literature, which includes a great deal of mandatory reading, female students' grades are 1.4 points higher on average [9]. Other countries are reporting similar phenomena such as higher dropout rates and lower average grades among male students [10]. Various sources have explained this in terms of genetic differences, different gender based learning identities, societal expectations and the feminization of the education sector [10]. A number of initiatives exist to increase reading engagement and decrease the gender gap in education, such as multiple initiatives related to serious games.

## 2 Previous Work and Theoretical Foundation

Scholars have described multiple principles for designing serious games for educational purposes [11–17, 26, 34], including a focus on reading engagement [10, 12, 13]. Important aspects of serious game design for learning and reading engagement include realism, feedback, discovery, repetition, guidance, flow, digital storytelling and debriefing [11–17]. Furthermore, motivation is important. Reading engagement, both in serious games and in other media, including analog media, requires the reader to be motivated [13, 16]. This involves aspects such as important elements within the text's content, text comprehension, knowledge acquisition and social interactions that employ knowledge and lessons learned from the text [13, 16]. Scholars have also emphasized the specific aspects of intrinsic motivation as important when designing serious games for reading engagement [16, 17]. These can include elements such as curiosity, a desire for a

challenge, flow, involvement and narrative engagement [16–18]. In particular, narrative engagement [18] seems important within a serious game focused on reading engagement because of its relation to the story experienced while playing the game. Thus, it may result in imaginative immersion, narrative involvement or narrative immersion. The desire to know how the story of *The Hosier and His Daughter* unfolds evokes curiosity, suspense and narrative engagement, making the players want to continue playing [18].

Studies have also included transmedia storytelling as a gateway to reading engagement or educational purposes by combining analog reading with parts of the story included within a serious game [10, 19, 29–31]. The term transmedia storytelling is defined and used differently across disciplines. However, there is common agreement that it is a method or technique for telling a story across media platforms that often includes digital technologies such as serious gaming. Ryan, among others, stated that a successful digital transmedia storytelling requires a process of active collaboration in the co-creation of meaning [20].

### 3 Methods

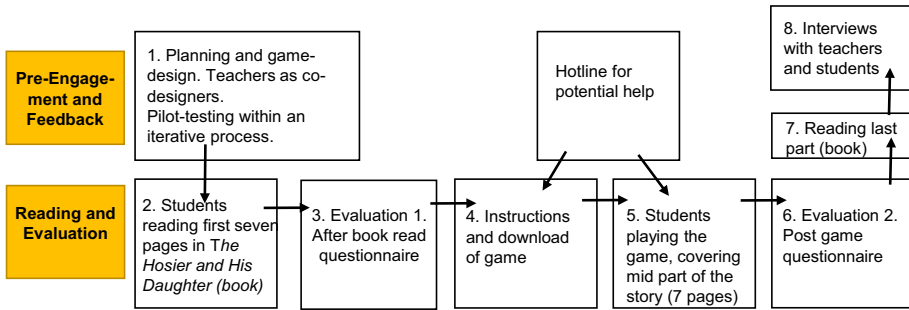
#### 3.1 Participants and Ethical Issues

This study in transmedia storytelling included 52 students from two Danish classes (M and S). Both classes were from Ørestad Gymnasium, which is located in Copenhagen, Denmark, and has a special profile focusing on media, communications and culture. Class M had a media studies profile and consisted of 27 students (14 male, 13 female). Class S had a social science profile and 25 students (12 male, 13 female). All participants gave informed consent and were informed that they could withdraw from the study at any time and their participation did not influence their grade. In addition, all participants were provided with anonymized ID numbers, and all data were labeled with these IDs. We applied special considerations when recruiting teenagers (ages 17–19), in accordance with Danish data law, the international code of conduct [23] and ethical approval from the gymnasium.

#### 3.2 Procedure and Analysis

This study was conducted during the COVID-19 pandemic, so most of the study was conducted online. All teaching at Ørestad Gymnasium also took place online. The eight-step procedure used in this study is illustrated in Fig. 1. The procedure was divided into two major approaches. The pre-engagement and feedback stages (stages 1 and 8, and the hotline) focused mainly on the design and implementation elements. The reading and evaluation stages focused mainly on the evaluation elements.

Step 1: An important focus of this study was to involve the Ørestad Gymnasium teachers who taught the students about *The Hosier and His Daughter*. This was done by following a participatory design approach [22] in which the end-users included both teachers and students. The teachers served as gatekeepers who facilitated and controlled the reading process in areas such as the curriculum's aims, focus, knowledge, skills and analysis. Therefore, the teachers were involved as co-designers very early in the process.



**Fig. 1.** An eight-step procedure used in this study.

They were asked for input and feedback, but they also worked as partners in the design process regarding changes to aspects of the game's development. Prior to the co-design efforts with the teachers, class observations and short interviews with students were conducted. Furthermore, the gymnasium's headmaster was interviewed during Step 1 and provided acceptance and engagement related to this study. Nine students from outside Classes M and S took part in pilot testing within an iterative process.

Step 2: Participants read the first seven pages of the novella *The Hosier and His Daughter* [1]. The novella was included in a textbook with other novellas and short stories. Prior to the reading, the teachers provided some minor instructions.

Step 3: The participants answered the first evaluation questionnaire after reading the novella's first seven pages. The questionnaire consisted of general questions related to the story and reading engagement at this stage. In total, 50 students completed Evaluation 1 (96% response rate).

Steps 4 and 5: The participants installed and played the game from a Google Drive folder. There were clear instructions for how to download the game. The game covered the part of *The Hosier and His Daughter* on pages 95–102 [1]. These specific pages were covered in the game due to an interesting time jump to five years later in the original story. This time jump in the narrative can challenge reader engagement, as the story at this point could be interpreted as having a natural end without any cliffhangers for a continuous read.

For Steps 4 and 5, a hotline was established so the students could contact the designers if they struggled with downloading the game, unforeseen bugs or other difficulties with the game. The hotline was used four times, and showed the importance to ensure that the students played the game and were not disengaged due to technical problems.

Step 6: The students answered the second evaluation questionnaire, which contained questions about their engagement after having played the game. The questionnaire had the following themes: learning, engagement and the game aspects; it was inspired by the User Engagement Scale [24]. For Evaluation 2, 20 participants from Class M (75% response rate), and 18 students from Class S participated (72% response rate). In total, 38 students from the two classes (16 males, 22 females), provided data for Evaluation 2.

Step 7: The students read the remaining pages of *The Hosier and His Daughter* (book).

Step 8: Interviews were conducted with two teachers and four students (three students from the M class, and one student from the S class). The semi-structured interviews had the following themes: esthetic appeal, durability, involvement, focused attention, novelty and usability.

Researchers analyzed the questionnaires (Evaluations 1 and 2) using cumulative frequency (i.e., the total number of answers to specific questions). They analyzed the interviews using traditional coding [25] in four steps: organizing, recognizing, coding, and interpretation. They transcribed the interviews verbatim to be organized and prepared for data analysis. The researchers read the transcripts several times to recognize the concepts, which also included a general sense of the information and an opportunity to reflect on its overall meaning. Two researchers coded the interviews independently and then afterwards matched the themes derived, following the procedures to ensure inter-analysis reliability [32, 33]. The themes derived included engagement, learning, and game design. Researchers then categorized and interpreted each interview statement by following an interpretation of positive and negative statements within each of the three themes.

## **4 Design and Implementation**

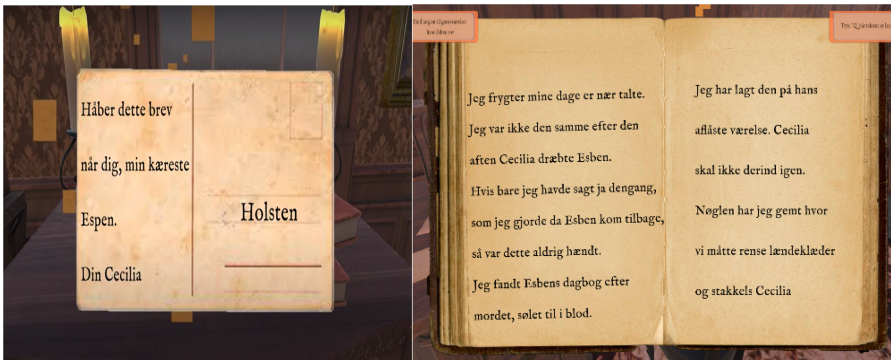
### **4.1 A Subsection Sample**

The serious game was designed in Unity using C# for Windows, Mac and Linux. The game genre used within this study was an adventure puzzle solving game. To design the game, we followed eight flow principles described by Sweestser and Wyeth [21] to maintain the reading engagement. The eight elements of flow are as follows: concentration, challenge, skills, control, clear goals, feedback, immersion and social participation [21]. The students were able to start playing the game without reading a manual and learned the game controls in an introductory tutorial [21]. At the very start of the game, instructions appeared showing the keys to use for in-game navigation (Fig. 2, right). As the players discovered interactive objects, hints were shown, including which buttons to use for interaction. To promote concentration, this game implemented visual- and auditory stimuli using interactive objects that rewarded the player with a voice-over and written story text. The tasks (objects) needed to be completed in a specific order to ensure that the students read the story in order and followed the plot and original story. To highlight the reading objects, a particle system (Fig. 2, left) was implemented above the objects. The particles made it easier for the players to identify the objects needed to progress in the story. To avoid confusing players, the particles disappeared once activated. To evoke further engagement, sound effects were added when picking up clues or keys. This was done as players interacted with the clue to provide immediate feedback (Fig. 2, left).



**Fig. 2.** Instructions for navigation (right). Particle effects highlighting a reading object (left).

The students were expected to become less aware of their surroundings and more spatially immersed [17, 18, 21, 26] in the story, thereby improving their reading engagement for this difficult text. The immersive elements were implemented using visual in-game representations and settings that included assets appropriate for a house during the nineteenth century. In addition, the notes and letters the players had to find resembled old paper with text in a nineteenth-century-looking font. (Fig. 3, left). To further enhance the players' immersion, various ways of representing the text were implemented, though it appeared most often as text in an old book (Fig. 3, right).



**Fig. 3.** The notes and letters the players had to find, which resembled old paper (left). Reading text presented in an old book format (right).

## 5 Findings

### 5.1 Reading Engagement and Learning

The findings from Evaluation 1 (after the analog seven-page reading) and from Evaluation 2 (after the reading within the serious game) revealed clear improvements in reading

engagement within and after the gameplay compared to reading from the book (Table 1). Overall, 85% of the students found the in-game text easy or very easy to read compared to the book text, which only 16% considered easy to read (Table 1). In addition, 76% of the students enjoyed reading the story in the game to a large or very large extent, compared to 24% for the book. After playing the game, 55% of the students indicated that they would like to continue reading the story to a large or very large extent, compared to 36% after reading the book. Moreover, after playing the game, 56% of the students were immersed in the story to a large or very large extent, compared to only 14% after reading the book (Table 1).

**Table 1.** Results evaluation 1 (E1, after book read) and evaluation 2 (E2, after game play).

| Results from Evaluation 1 (after book read, n = 50) and Evaluation 2 (after game play, n = 38). Numbers are in percentage | To a very small extent % | To a small extent % | To some extent % | To a large extent % | To a very large extent % |
|---|--------------------------|---------------------|------------------|---------------------|--------------------------|
| E1: I found the text in the novella easy to read  | 2                        | 30                  | 52               | 16                  | 0                        |
| E2: I found the text in the game easy to read   | 0                        | 5                   | 10               | 27                  | 58                       |
| E1: I enjoyed reading the story   | 8                        | 32                  | 36               | 24                  | 0                        |
| E2: I enjoyed reading the story in the game   | 0                        | 3                   | 21               | 55                  | 21                       |
| E1: I want to continue reading the story  | 8                        | 28                  | 28               | 32                  | 4                        |
| E2: I want to continue reading the story  | 3                        | 3                   | 39               | 37                  | 18                       |
| E1: I was immersed in the story   | 24                       | 30                  | 32               | 14                  | 0                        |
| E2: I was immersed in the story   | 3                        | 7                   | 34               | 34                  | 22                       |
| E2: The story affected me emotionally   | 22                       | 24                  | 36               | 10                  | 8                        |
| E2: It was more enjoyable to read the story in the game than the book   | 3                        | 5                   | 8                | 34                  | 50                       |
| E2: I wanted to know what happens to the characters in the game   | 0                        | 3                   | 18               | 55                  | 24                       |

The immersion question was phrased differently for Evaluations 1 and 2 to provide proper Danish language in its context. The immersion question addressed narrative immersion, so the same tendencies and validation of the students’ immersion were revealed due their desire to know how the story would unfold. Overall, 79% of the students indicated that they wanted to know, to large or very large extent, what happens to the characters after playing the game. Narrative immersion may create curiosity, suspense and excitement, making the player want to continue reading [18]. Overall, 84% of the students perceived, to a large or very large extent that, that reading the story was more enjoyable in the game than in the book. This last question was not a direct

indicator of reading engagement and involved potential bias (e.g., user, context and technology novelty effects). Nevertheless, it provided perceptions of enjoyment [21].

The game's ability to improve reading engagement and convey specific details surrounding the story's narrative was also a main focus of the teachers' feedback.

*The potential with this serious game is there, along with the ability to motivate certain students to read longer texts that would otherwise be too difficult for them...a game can also go deep into the details in very specific parts of the text. (Teacher 1).*

*The game can make the students remember more from the story...and when you experience the story through a game, where you [the authors of this study] made the graphics, it controls how the students perceive the environment and the characters, just like when you watch a movie. When you don't have visual aids, you rely on your imagination, and you imagine the characters and the environment, so in one way or the other, you could say that it is a minor disadvantage (Teacher 2).*

The quote from Teacher 2 emphasized the importance of being professional and providing the game environment with considerations, as it controls the perceptions. This is a well-known point from previous discussions of book-to-film adaptations. However, it is important to remember that serious games also work with messages and provide specific perceptions and interpretations based on their design and textual messages.

## 5.2 The Game Mechanics

The evaluations and interviews revealed that the students enjoyed the game. In addition, the game mechanics were effectively designed. Overall, 82% of the students always knew what to do in the game to a large or very large extent, and 79% found it easy to control the character to large or very large extent (Table 2). Furthermore, 78% of the students found it easy to follow the story. However, the interviews also revealed minor suggestions for improvements. In spite of the pilot testing and iterative adjustments to the game and tutorial, some students seemed to struggle with the controls and needed some time to get used to them.

**Table 2.** Results evaluation 2, game mechanics

| Results from Evaluation 2 (after game play, n = 38). Numbers are in percentage | To a very small extent % | To a small extent % | To some extent % | To a large extent % | To a very large extent % |
|--|--------------------------|---------------------|------------------|---------------------|--------------------------|
| I always knew what to do in the game   | 0                        | 0                   | 18               | 42                  | 40                       |
| I found it easy to control the character                                       | 3                        | 0                   | 18               | 37                  | 42                       |
| I found it easy to follow the story  | 0                        | 5                   | 17               | 39                  | 39                       |
| I found the game too easy  | 0                        | 16                  | 37               | 23                  | 24                       |
| I was easily distracted while playing  | 16                       | 47                  | 26               | 8                   | 3                        |

As many other scholars have realized when designing serious games, it is especially challenging to find the right balance between skills and challenges, to keep the players in the flow state [28]. Some participants in this study would have liked the game to be a bit more challenging (Table 2), be less monotonous or tedious and feature better links, clues or semiotics to story-specific elements, as well as a customizable reading speed to provide dynamic difficulty adjustment.

## 6 Conclusion

To design a successful serious game for educational purposes, it is crucial to involve teachers in the design process. A serious game has the potential to bring a new level of understanding and visualization to a given story in the classroom. However, when focusing on literature (e.g., novels, novellas, poetry), books and games must supplement each other through the inherent advantages of their media formats. This is also emphasized in the literature [27], so it is beneficial to explore further possibilities related to transmedia storytelling. By switching between the text and the game, the students in this study experienced improved reading engagement, as well as a deeper understanding of the story's environments and characters. However, a game cannot provide insight into deeper subjects in the text or the vocabulary that the author uses, which are also significant aspects of the learning outcomes expected in Danish literature classes. In conclusion, this serious game, designed specifically to teach *The Hosier and His Daughter*, improved students' reading engagement, leading to much higher immersion and ease and enjoyment of reading. The story was well told in the game, and the learning outcome was achieved through increased engagement. However, future work is needed to create significant evidence and insights regarding students' reading engagement via transmedia storytelling. First, researchers need to include a much higher number of students from classes across different gymnasiums within the data collection. Second, they need further details on the identification of readers, including their confidence in reading. It is important to emphasize that there is no agreed taxonomy for reading engagement, and the inclusion of serious games is still diverse in its outcomes, and certainly understudied as a transmedia subject for inclusion in the Danish gymnasium. It would also be interesting to create different options in the game design to accommodate a diversity of students and reader types.

## References

1. Blicher, St. St.: Hosekræmmeren [The Hosier and His Daughter][1829]. In: Møller, L., Thurah, T.: *Kanon i Dansk 9*. Gyldendal, Copenhagen (2005)
2. Baron, N.S.: *Words Onscreen: The Fate of Reading in an Online World*. Oxford University Press, Oxford (2015)
3. Ross, R.S., McKechnie, L., Rothbauer, P.M. (eds): *Reading Still Matters: What the Research Reveals About Reading, Libraries, and Community*. Libraries Unlimited, Santa Barbara (2018)
4. Twenge, J.M., Martin, G.N., Spitzberg, B.H.: Trends in US Adolescents' media use, 1976–2016: the rise of digital media, the decline of TV, and the (near) demise of print. *Psychol. Pop. Media Cult.* **8**(4), 329 (2019)

5. Cai, J., Gut, D.: Literacy and digital problem-solving skills in the 21st century: what PIAAC says about educators in the United States, Canada. *Fin. Jpn. Teach. Educ.* **31**(2), 177–208 (2020)
6. Book and literature panel Annual Report: Bogen og litteraturens vilkår 2018 [The book and literature 2018]. SLKS, Agency for Culture and Palaces. [https://slks.dk/fileadmin/user\\_upload/0\\_SLKS/Fotos/Bogpanel/Rapport18/Aarsrapport\\_2018.pdf](https://slks.dk/fileadmin/user_upload/0_SLKS/Fotos/Bogpanel/Rapport18/Aarsrapport_2018.pdf). Accessed 21 July 2021
7. OECD 2010/PISA 2009: Results: Learning to Learn – Student Engagement, Strategies and Practices, vol. III. <https://doi.org/10.1787/9789264083943-en>
8. DEA: Gymnasiet taber drengene [boys lacks behind in the Gymnasium]. <https://www.datocms-assets.com/22590/1586245825-deanotatgymnasiettaberdrengene.pdf>. Accessed 21 July 2021
9. Statistics Denmark: Karaktergennemsnittet stiger for alle grupper af studenter (opdateret). <https://www.dst.dk/da/>. Accessed 21 July 2021
10. Pasalic, A., Andersen, N.H., Carlsen, C.S., Karlsson, E.Å., Berthold, M., Bjørner, T.: How to increase boys’ engagement in reading mandatory poems in the gymnasium: Homer’s “The Odyssey” as transmedia storytelling with the Cyclopeia narrative as a computer game.. In: Guidi, B., Ricci, L., Calafate, C., Gaggi, O., Marquez-Barja, J. (eds.) GOODTECHS 2017. LNICSSITE, vol. 233, pp. 216–225. Springer, Cham (2018). [https://doi.org/10.1007/978-3-319-76111-4\\_22](https://doi.org/10.1007/978-3-319-76111-4_22)
11. Zhonggen, Y.: A meta-analysis of use of serious games in education over a decade. *Int. J. Comput. Games Technol.* **2019**, 1–8 (2019)
12. Sylvester, A., et al.: Mapping learning and game mechanics for serious games analysis. *Br. J. Edu. Technol.* **46**(2), 391–411 (2015)
13. Naumann, J.: A model of online reading engagement: linking engagement, navigation, and performance in digital reading. *Comput. Hum. Behav.* **53**, 263–277 (2015)
14. Abdul Jabbar, A.I., Felicia, P.: Gameplay engagement and learning in game-based learning: a systematic review. *Rev. Educ. Res.* **85**(4), 740–779 (2015)
15. Vivitsou, M.: Digital storytelling in teaching and research. In: Tatnall, A., Multisilta, J. (eds.) *Encyclopedia of Education and Information Technologies*. Springer, Cham (2018). [https://doi.org/10.1007/978-3-319-60013-0\\_58-1](https://doi.org/10.1007/978-3-319-60013-0_58-1)
16. Guthrie, J.T., Wigfield, A., You, W.: Instructional contexts for engagement and achievement in reading. In: Christenson, S., Reschly, A., Wylie, C. (eds.) *Handbook of Research on Student Engagement*, pp. 601–634. Springer, Boston (2012). [https://doi.org/10.1007/978-1-4614-2018-7\\_29](https://doi.org/10.1007/978-1-4614-2018-7_29)
17. Wouters, P., Van Nimwegen, C., Van Oostendorp, H., Van Der Spek, E.D.: A meta-analysis of the cognitive and motivational effects of serious games. *J. Educ. Psychol.* **105**, 249–265 (2013)
18. Schönau-Fog, H., Bjørner, T.: “Sure, I Would Like to Continue” a method for mapping the experience of engagement in video games. *Bull. Sci. Technol. Soc.* **32**(5), 405–412 (2012)
19. Kalogeras, S.: Media convergence’s impact on education. In: *Transmedia Storytelling and the New Era of Media Convergence in Higher Education*, pp. 67–111. Palgrave Macmillan, London (2014). [https://doi.org/10.1057/9781137388377\\_3](https://doi.org/10.1057/9781137388377_3)
20. Ryan, M. (ed.): *Narrative Across Media: The Languages of Storytelling*. University of Nebraska Press, Nebraska (2004)
21. Sweetser, P., Wyeth, P.: GameFlow: a model for evaluating player enjoyment in games. *Comput. Entertain.* (CIE), **3**(3), 3–3 (2005)
22. Halskov, K., Hansen, N.B.: The diversity of participatory design research practice at PDC 2002–2012. *Int. J. Hum. Comput. Stud.* **74**, 81–92 (2015)
23. ICC/ESOMAR. <https://www.esomar.org/what-we-do/code-guidelines.?page=what-we-do/code-guidelines>. Accessed 21 July 2020

24. O'Brien, H.L., Cairns, P., Hall, M.: A practical approach to measuring user engagement with the refined user engagement scale (UES) and new UES short form. *Int. J. Hum. Comput. Stud.* **112**, 28–39 (2018)
25. Portaleoni, C.G., Marinova, S., ul-Haq, R., Marinov, M.: Data analysis and findings. In: *Corporate Foresight and Strategic Decisions Lessons from a European Bank*, pp. 130–246. Palgrave Macmillan, London (2013). [https://doi.org/10.1057/9781137326973\\_7](https://doi.org/10.1057/9781137326973_7)
26. Hafner, M., Jansz, J.: The players' experience of immersion in persuasive games: a study of my life as a refugee and PeaceMaker. *Int. J. Serious Games* **5**(4), 63–80 (2018)
27. Sande C., Michael, D.: *Serious Games: Games That Educate, Train, and Inform*. Muska & Lipman/Premier-Trade, Mason, USA (2015)
28. Csikszentmihalyi, M.: *Flow: The Psychology of Optimal Experience*. Harper Perennial, New York (1990)
29. Raybourn, E.M.: A new paradigm for serious games: transmedia learning for more effective training and education. *J. Comput. Sci.* **5**(3), 471–481 (2014)
30. Gambarato, R., Dabagian, L.: Transmedia dynamics in education: the case of Robot Heart Stories. *Educ. Media Int.* **53**(4), 229–243 (2016)
31. Poy, R., García, M.: Wizards, elves and orcs going to high school: how role-playing video games can improve academic performance through visual learning techniques. *Educ. Inf.* **35**(3), 305–318 (2019)
32. Goodwin, L.D., Goodwin, W.L.: Are validity and reliability 'relevant' in qualitative evaluation research? *Eval. Health Prof.* **7**(4), 413–426 (1984)
33. MacPhail, C., Khoza, N., Abler, L., Ranganathan, M.: Process guidelines for establishing Intercoder reliability in qualitative studies. *Qual. Res.* **16**(2), 198–212 (2016)
34. Báldy, I.D., Hansen, N., Bjørner, T.: How to design and evaluate a serious game aiming at awareness of therapy skills associated with social anxiety disorder. In: *Proceedings of the 6th EAI International Conference on Smart Objects and Technologies for Social Good*, pp. 156–162 (2020)