Methodyca

A Digital Game to Teach Research Methods

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ABSTRACT

Methodyca is a browser-based adventure game whose aim is to introduce the field of research methods to university students, particularly targeting those in game design programs. Developed by faculty and graduate students at Tallinn University, with input from partner institutions in and outside of Estonia, the game seeks to increase players' motivation and competences with regard to research methods, as well as to map out possible research topics and prospective supervisors in the fields of game design and game studies. In doing so, the game addresses the scarcity of learning resources available to students in games education. The main content of the game, however, is equally useful to students in non-game-related curricula, as the focus is on general quantitative, qualitative, and design-based methods common in the social sciences, including in HCI programs.

CCS CONCEPTS

• **Applied computing** → Education; Interactive learning environments; Computers in other domains; Personal computers and PC applications; Computer games.

KEYWORDS

Learning games, research methods, game design, game-based learning

NordiCHI '20, October 25–29, 2020, Tallinn, Estonia

ACM ISBN 978-1-4503-7579-5/20/10.
https://doi.org/10.1145/3419249.3420062

ACM Reference Format:
Martin Sillaots, Mikhail Fiadotau, Ralph Söthe-Garnier, David Robert Upshall, Peadar Callaghan, Kaisa Norak, Ahmed Mohamed Said Anwar Elshenawy, Osman Sinan Emiroğlu, Elena Gorshkova, Iryna Selina, Asian Hõ, and Oluwafiyikewa Aigbovbioise Alawode. 2020. Methodyca: A Digital Game to Teach Research Methods. In *Proceedings of the 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society (NordiCHI '20), October 25–29, 2020, Tallinn, Estonia.* ACM, New York, NY, USA, 4 pages. https://doi.org/10.1145/3419249.3420062

1 INTRODUCTION

Research [1, 3] and course feedback show that students perceive Research Methods as one of the most intimidating and unengaging university courses. In ICT curricula, students often only realize its importance once they start working on their thesis, which negatively affects their research quality. This is in part due to overreliance on traditional textbook-and-lecture instruction [1], which is insufficient for 21st century digital competences. Furthermore, despite game design and game studies being rapidly growing study fields across the globe, only limited resources exist on research methods and areas in the field [5]. With the number of students in game courses constantly rising and the field itself being fragmented and heterogeneous, there is a need for a database of potential research topics and supervisors, including from the game industry. Finally, while applied research is conducted at videogame companies around the world, it often lacks in quality, highlighting a need for professionals with stronger research skills and the benefits of industry–university cooperation.

A solution to these challenges can lie in designing a learning game about research methods. It has been shown that using games to teach research methods enables situated, active learning and can increase students' motivation and understanding of the subject [2]; while involving game design students in the creation process

Figure 1: The portal scene in Act 1.

doubles as a practical exercise and provides a case study for future intakes.

With this in mind, faculty and graduate students in the Digital Learning Games MSc program at Tallinn University have started work on *Methodyca* (http://dlg.tlu.ee/methodyca., a browser-based online game where players learn about research methods and go through all the steps of creating a research plan.

The game's main goals are:

- Increase students' motivation toward and understanding of research methods
- Provide a database of up-to-date research topics in the field, including topics for applied research contributed by game companies
- Build a network of potential thesis supervisors and reviewers
- Streamline students' planning of their final thesis

2 GAME OUTLINE AND PLOT

In *Methodyca*, the player discovers the domain of research methods by exploring the game world and interacting with non-player characters who offer guidance on navigating it. At the end, the game produces a research plan based on the player's choices and actions, making sure that the selected elements are consistent and adequate to the chosen topic. In the background, the game collects information that can be used to analyze students' research interests, typical mistakes, etc.

The game is structured as a series of mini-games introducing various research methods and methodologies, which are integrated into a larger-scale point-and-click adventure. Cognizant of the benefits of integrating narrative and game elements in learning games [4], the development team sought to construct a narrative frame that both provides meaningful context for the player's actions and increases their motivation by introducing elements of suspense and discovery.

The story uses a three-act structure and follows a university student on a quest to track down their missing supervisor. In Act 1, the protagonist arrives for an appointment with their thesis supervisor and finds her office in disarray and the supervisor missing (Figure 1). There are, however, clues that the supervisor may have (wittingly or unwittingly) traveled to another dimension. By solving a puzzle testing their understanding of the distinction between qualitative and quantitative methods, the protagonist activates an interdimensional portal and follows their supervisor through it into an unknown world. In Act 2, which serves as the main part of the game, the protagonist finds themselves in a world of research methods. This world consists of two parallel realms, representing quantitative and qualitative methods. The player then navigates and switches between the two realms, relying on the guidance of non-player characters (fictionalized versions of notable scholars ranging from William Sealy Gosset to Margaret Mead) and solving mini-games dedicated to specific research methods and methodologies in order to advance and come closer to finding the missing supervisor (Figure 2). Towards the end of Act 2, the player consolidates their knowledge of both qualitative and quantitative methods as the game invites them to explore mixed-methods approaches in the domain of design research. After learning about these as well, the protagonist has collected enough information to locate their supervisor and proceeds to Act 3. In this act, the protagonist finds their supervisor in a secret facility, trying to fix a portal that would take them back to our world. The player can help them by deciding on their research topic (out of a database of broader areas), compiling their research plan, and making sure it is methodologically consistent.

The game embraces player agency by allowing the player to decide on what mini-games to play and in what order; while there is a minimal number they must complete to proceed, the player does not have to solve every challenge. The mini-games themselves focus on general research methodologies (survey, case study, experiment, etc.) and data collection methods (interview, observation, document study, etc.) in the social sciences; as such, they can be useful for non-game-design students as well. It is Act 3, where the player has

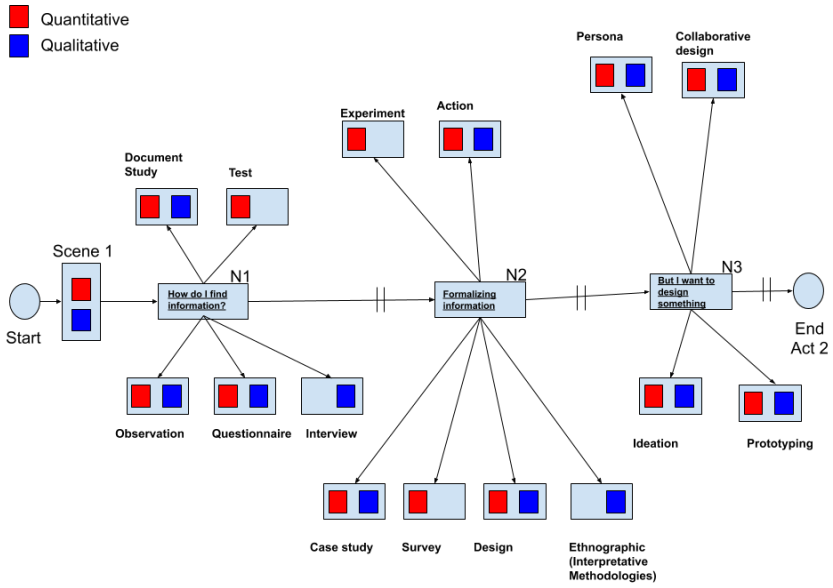

Figure 2: Conceptual map of Act 2.

Figure 3: Questionnaire minigame from Act 2.

to decide on their research topic, that introduces research topics more specific to game studies and game design.

3 DEVELOPMENT PROCESS AND NEXT STEPS

As of the time of writing, *Methodyca* is a work in progress, with the main game being in alpha development and the minigames mostly being at the stage of conceptual design. In addition to coding and game design, the creation of visual and audio assets is also underway. The current progress of the game can be seen at http://dlg.tlu.ee/methodyca. A playable version of the game is to be completed in fall 2020, which will be followed by pilot testing with students at Tallinn University and the partner institutions involved in the project. The full project timeline is shown in Table 1

The game's modular architecture and flexible narrative frame allow for extending its content by adding new mini-games to cover more research methods. This has made it possible for us to use additional content creation for *Methodyca* as a project-based learning activity at Tallinn University in the framework of LIFE projects [6]: Bachelor- and Master-level students can earn credit points by suggesting ideas for mini-games, forming teams around them, and developing them into working prototypes, which may then be integrated into the main game. Early prototypes

Table 1: Project timeline

Month (in 2020)	Outcome
January–February	Needs analysis
February–March	Developing the research process model
March–May	Conceptual design; collecting research topics for the database
June–October	Development and implementation
November–December	Pilot testing

of such student-made mini-games include *Interview Simulator* (http://www.tlu.ee/~plaupa/interviewsimulator) and *Binoculars*, an observation game (http://www.tlu.ee/~martins/observation/). Future additions, such as extra narrative content and new mini-games covering more research methods and methodologies, can also be integrated following the initial release, based on user demand and availability of resources.

ACKNOWLEDGMENTS

This project was funded through the IT Academy Development Grant provided by the Education and Youth Authority (previously the Information Technology Foundation for Education), grant no. 7-1.1/1-20.

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