GRID 2024
12. INTERNATIONAL SYMPOSIUM ON GRAPHIC ENGINEERING AND DESIGN
14-16. NOVEMBER 2024

12th GRID SYMPOSIUM

Game design studies: Through the educational prism

Bojan Banjanin, Jelena Kerac, Savka Adamović, Rastko Milošević
University of Novi Sad, Faculty of Technical Sciences, Department of Graphic Engineering and Design, Novi Sad, Serbia

Introduction

To most, games are often observed as activities meant to enrich leisure time; something that is done to relax by themselves or in the company of others. By playing games players are provided with a sense of advancement and fulfilment by following specific rules and overcoming obstacles. Kafai and Burke (2015) adopted and wrote about the constructivist approach to using games in education. Contrary to instructional approaches, the constructionist approach is learning by making games. In Piaget's (1951) work, games of construction are considered the highest form of gameplay, as games require children to build representations of the world according to their understanding.

While digital learning finds its roots in the broader use of computers, there was both an explosion of new research and a revisiting of the old ones. One such important research that has increased in popularity recently is surrounding the Community of Inquiry (CoI). Coined by Garrison, Anderson, and Archer (1999), CoI embodies an educational experience. CoI consists of three core elements: social presence, cognitive presence, and teaching presence. All these three elements, interlacing, further support discourse, set climate, and select content.

The CoI survey was developed and first tested by researchers in 2008 to aid understanding and implementation of CoI (Arbaugh et al., 2008). The survey consists of 34 questions distributed among the three key elements. Like the general CoI framework, it is actively researched today while maintaining its reliability and validity (Stenbom, 2018).

Problem Description

This paper describes how these two approaches were applied, tested, discussed, and modified for different purposes with the goal of creating a better learning environment and for students to build better creative projects for their portfolios. Alongside, the authors implemented the approach where the presence of the teacher and their advice and mentorship are at students' disposal.

Methods

In this section, the author will present the use and examples of one of the key elements: Teaching Presence.

Teaching Presence in the practical part of the university course in Computer Games subject

The practical part of this university course is acted out in the computer classroom. Students are divided into six work groups, and each workgroup meets once a week in the computer classroom for 3 hours and 15 minutes (short break). Furthermore, each student workgroup consists of 16 students, allowing the teaching assistant (TA) or the professor to give individual attention to each student in need. This subsection is written from the experience gained from 2 semesters where the authors held six student workgroups per week, spanning two school years.

Educational work at different courses and game jams outside of university

In the second part of this study, examples of curriculum are examined. Two different programs are described in this paper and one game jam each one organized by Epic Games Novi Sad (Epic Games Novi Sad, 2024a), 3Lateral (3Lateral, 2024), and Materriya Talent and Community Development team (Materriya, 2024) in collaboration with university professors.

The first one is the World Building Fellowship: Unreal Editor for Fortnite (UEFN) program (Epic Games Novi Sad, 2024c). Thirteen participants have passed through the program which lasts eight hours a day, five days a week for three weeks in total.

The second course is called UEFN: Game Crafting program (Epic Games Novi Sad, 2023). Each iteration of the program lasts three working weeks. Every week participants had three lecture days (Monday, Wednesday, Friday) and working days on Saturdays and Sundays. The third program was the UEFN Game Jam (Epic Games Novi Sad, 2024b) where participants had the task to make a video game (island) for Fortnite by utilizing UEFN and Fortnite Creative tools during the span of two days (Saturday and Sunday) in the form of competition. Each day participants work for eight hours for a total of 16 hours after which they need to present playable games in Fortnite. There were a total number of seven teams consisting of three members (a total of 21 participants).

Results

This paper describes how these two approaches were applied, tested, discussed, and modified for different purposes with the goal of creating a better learning environment and for students to build better creative projects for their portfolios. Alongside, the authors implemented the approach where the presence of the teacher and their advice and mentorship are at students' disposal. Results presented here are based on working hours and the distribution of the activities throughout the whole program. These activities are separated into three main categories: (1) follow along type of class, where students learn some new lecture by watching and replicating what the lecturer does; (2) working independently on their projects (with the help of a mentor) and (3) presentation of their projects in front of the group.

Seven different methodologies are presented for seven different teaching activities: university classes for Computer Games subject for two distinct semesters (Methodology 1 and 2); world building in Unreal Engine program for professionals (Methodology 3); three game crafting programs in UEFN (Methodologies 4, 5, and 6), and game jam in UEFN (Methodology 7).

Table 1

Distribution of working hours in Computer Games subject at the university

	Number of hours in one class	Total number of hours in semester	Teaching hours per class (follow along)	Number of hours working in a team	Mentor consultation hours
Methodology 1	3	42	3	-	-
Methodology 2	3	42	1.5	1.5	1.5

Table 2

Distribution of working hours in World Building in Unreal Editor for Fortnite for professionals

	No. of hours in one day/class	Total no. of hours during course	Teaching hours per class (follow along)	No. of hours on individual projects	Mentor consultation working hours	Project presentation of milestones
Methodology 3	6	75	40.5	28.5	28.5	6

Table 3

Distribution of working hours in Unreal Editor for Fortnite: Game Crafting program for undergraduates

	No. of hours in one day/class	Total no. of hours during course	Teaching hours per class (follow along)	No. of hours on individual projects	Mentor consultation working hours	Project presentation of milestones
Methodology 4	3	51	24	24	24	3
Methodology 5	3	45	24	18	18	3
Methodology 6	3	48	10.5	34.5	34.5	3

Table 4

Distribution of working hours in Game Jam in Unreal Editor for Fortnite

	No. of hours in one day/class	Total no. of hours during course	Teaching hours per class (follow along)	No. of hours on individual projects	Mentor consultation working hours	Project presentation of games
Methodology 7	8	16	1.5	13.5	13.5	1

Discussion / Conclusion

By increasing the number of hours reserved for working on individual projects a lot of benefits can be derived not only for students but also for teachers (mentors). One such benefit is that by leaving more time to help students achieve their goals, teachers have the opportunity to work on a variety of projects and hear a lot of new and interesting ideas which broadens their knowledge and also gives them experience on how to approach similar projects and problems in the future. If the participants have prior knowledge in the matter and/or are professionals from the industry, teachers can acquire new skills and points of view which then can be transferred to the university classroom and other programs. Following the CoI framework and survey and shaping the lessons to support the teaching presence element, lecturers and students were able to build open and enjoyable learning environments.

REFERENCES

3Lateral. (2024) Homepage. Available from: https://www.3lateral.com/ [Accessed 10th September 2024]

Arbaugh, J.B., Cleveland-Innes, M., Diaz, S. R., Garrison, D. R., Ice, P., Richardson, J. C. & Swan, K. P. (2008) Developing a community of inquiry instrument: Testing a measure of the Community of Inquiry framework using a multi-institutional sample. The Internet and Higher Education. 11(3), 133–136. Available from: doi: 10.1016/j.iheduc.2008.06.003

Epic Games Novi Sad. (2024a) Artstation Portfolio, https://www.artstation.com/epic-games-novi-sad [Accessed 10th September 2024]

Epic Games Novi Sad. Artstation. Game Jam: Unreal Editor for Fortnite. (2024b) https://www.artstation.com/blogs/epic-games-novi-sad/qyDmy/otvorene-prijave-za-game-jam-unreal-editor-for-fortnite [Accessed 15th September 2024]

Epic Games Novi Sad. Artstation. News. (2023) Game Crafting: Unreal Editor for Fortnite. Available from: https://www.artstation.com/blogs/epic-games-novi-sad/LzzV3/game-crafting-unreal-editor-for-fortnite [Accessed 15th September 2024]

Epic Games Novi Sad. Artstation. World Building Fellowship: Unreal Editor for Fortnite. (2024c) https://www.artstation.com/blogs/epic-games-novi-sad/bopWw/world-building-fellowship [Accessed 15th September 2024]

Garrison, D. R., Anderson, T. & Archer, W. (1999) Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. The Internet and Higher Education. 2(2), 87–105. Available from: doi: 10.1016/S1096-7516(00)00016-6

Kafai, Y. B., & Burke, Q. (2015) Constructionist gaming: Understanding the benefits of making games for learning. Educational psychologist. 50 (4), 313-334.

Materriya. (2024) Homepage. Available from: https://materriya.com/ [Accessed 10th September 2024]

Piaget, J. (1951) 6. Principal Factors Determining Intellectual Evolution from Childhood to Adult Life. In: Organization and pathology of thought. Columbia University Press. pp. 154-175. Available from: doi: 10.7312/rapa92214-009

Stenbom, S. (2018) A systematic review of the Community of Inquiry survey. The Internet and Higher Education. 39, 22–32. Available from: doi: 10.1016/j.iheduc.2018.06.001

ACKNOWLEDGMENTS

This research has been supported by the Ministry of Science, Technological Development and Innovation (Contract No. 451-03-65/2024-03/200156) and the Faculty of Technical Sciences, University of Novi Sad through project "Scientific and Artistic Research Work of Researchers in Teaching and Associate Positions at the Faculty of Technical Sciences, University of Novi Sad" (No. 01-3394/1).