A Case Study of Game Design: From Idea to Implementation

Ibrahim Ahmad, and Azizah Jaafar

Abstract—The purpose of this study is to explore how new students taking the subject of computer games design game development as an artifact based on the idea of individually and collectively. To achieve the goal, we kept track on students' progress to design a game based on their skills and knowledge that they have. Characteristics of games, genre, strategy design, knowledge and collaboration between the students was then analyzed and viewed as a whole.

Index Terms—Game Design; Principle of Design; character; gamegenre

— — — — — — — — — ◆ — — — — — — — — —

1 INTRODUCTION

FOURdecades ago, Spacewar was the first computer game production produced [5][1], now in the form of digital games and interactive experience, making them much more enjoyable. Researches related to user experience playing computer games have also been done particularly in science and technology and the social sciences.[6].

Nowadays, the evolution of technology is more significant in the scope of influence towards the development and improvement of hardware and software used in the production of computer games to evolve better in a larger scale. This is based on the fact [5] that the production of computer games has taken place for more than four decades. And after a few decades later, computer games were produced in small groups consisting of programmers and not individuals. [3] [2]

In comparison with traditional games, [6] [2] computer games are growing more rapidly than leisure activities to the world's population. As a result, competition in the productionof computer games is routinely shared by some people with leisure activities, such as reading books, watching television, watching movies, surfing the Internet or playing sports. Many researchers pointed out that [6] digital form of the game provides a more enjoyable interactive experience. Researches related to the experience of playing computer games have been carried out, particularly in science and technology and social science.

2 BACKGROUND

Computer game is designed so that it cannot only be read,seen and heard, but it can also be manipulated,

- Ibrahim Ahmad is with the Interactive Media Department, Faculty of Information and Communication Technology, Universiti Teknikal Malaysia Melaka, Malaysia, Malacca76100. E-mail: ibrahim@utem.edu.my
- Azizah Jaafar is with the Institute of Visual Informatics, Universiti Kebangsaan Malaysia, Malaysia, Selangor 81310. E-mail: aj@ukm.my

eitherpredictable or unpredictable. It is known as interactionsbetween people and the media. [9] [1]

Researches in the field of game design and development ofcomputer applications have been implemented. However,studies concerning the design basis for the development ofcomputer games received too little feedback. This is because itrequires the examination of aspects of social, emotional andrelationship in life. [2]

When a designer desires to use their methods or techniquesfor planning the production of computer games, which isassociated with human social, they have limited space to makeit work. They really lack methods or techniques to developuser-centered design other than testing and evaluation. [7] [8][2]

Our research is to investigate how students interpret theirideas into real computer games, either individually or ingroups.

3 THE PROJECT AND STUDY CONTEXT

Our study explores strategies used in creating the idea to design a computer game with a number of new students taking the subject of Computer Games Development as our target group. We conducted a lab session for 30 students who attended courses at the Interactive Media degree.

At the beginning of the meeting, students were given a questionnaire to determine their level of knowledge and interest in the design and development of computer games. The questionnaire was also conducted to find out how often they played computer in a day and their knowledge of the genre and game features. In addition, students were also asked to express their opinion on the design of computer games that they love and to create their own ideas to design a computer game that they want.

Second meeting: Students were required to sit in groups randomly. They formed their own group of 4 to 5 people. Students were given the assignment to produce a computer game design with the features set. Among the characteristics of a given computer games were i.

storyline ii. levels iii. characters iv. lives v. enemies vi. time limit v. path option.

In groups, they discussed and gave their views on the production of computer game design ideas. Researchers moved from one group to another to see how they talk and be heard. Occasionally, the researchers asked for input from their discussions and asked them to explain their findings.

Third and fourth meeting: Researcher returns the sketch paper ideas generated by these groups at a meeting before. Earlier on, researchers did not tell the students that ideas generated in the form of paper and pencils will be translated into computer applications. After the design sketches and ideas stated in the proposal were returned, students were asked to produce them in the design of computer displays. Students were given two sessions of the meeting to produce the work.

The fifth meeting: This was the last meeting where studentspresented their work requested design and developmentapplications that have been produced in previous weeks.

The research was conducted using case study as a researchmethodology. [10] [4] Primary data source for this study werestudents who had just started learning the subject of computergame development. Computer game design producedindividually and collectively, whether in the form of ideas,sketches and digital graphic design and applications designedwere stored separately according to the meeting session, therefore, multiple iterations and the type of game genres onvarious stages of design and development of inspection. Thefollowing data sources were collected and used in interpretingthe results of (a) whether students who regularly play computergames can generate and interpret ideas of interest to the gamedesign (b) views of students on a regular computer gameplayed with the one that they're trying to produce (c) students'involvement in computer game design as an individual and ingroups (d) observation of individual and group

4 FINDING

The results of the study is projected in each case, focusingon the following matters: (a) background in each case(individual and group) (b) the characteristics of the game thatthey're trying to produce (c) Design Strategies (d) the role ofpeer feedback and collaboration on the design.

4.1 Individual

Individual computer game design produced by the studentsshows that it is similar to the game they had played before.Arguably, most of them did not produce their own ideas, butinstead tried to follow the existing game design based on theirexperience playing. Among the genre that they tried tohighlight were adventures games, strategy games, Actiongames and RPG Games. Many of the boys tried to design genrein the form of action games and RPG games, while girls tend toplay

strategy games in genre. Researchers interviewed severalstudents about the game design that they attempt to produce.When asked, some of them explained that their design is basedon game design that they have played before, thus it is toodifficult to develop it later.

4.2 Group

Unlike the production of computer game design doing bygroup, students seemed to participate actively and contributetheir own ideas and argued to defend the design they wantwhen they were in small groups consisting of 4 to 5 students.Most of the group tried to create a game in the form of RPG,strategy and adventure. From a researcher's point of view, thisimplies that group discussion may have a bigger impact increating computer game design with greater and logical ideas,in order to produce a design for a more structured computergame based on the requirements and characteristics required bythe researcher. Before the group discussion took place, theresearcher explained briefly what features should beincorporated in the design of their games to be produced. Thestrength of each discussion group was those who were quitedominant with expertise on the basis of computerprogramming. If they decided to include any design which is quite complex, they will ensure that the program code to beused will facilitate the application development process.

4.3 Development

During the game application development process, studentsin each group were given a task by one of the members who actas the head of the group. At some point, the process oftransferring the designs to the development process met itsdead end when the less skilled students in the use of sourcecode must rely on their members who were more proficient.Transferring of ideas in design to the actual application is not a
simple task. But without the resulting design, it is difficult forstudents to create an interesting and usable application.

5 CONCLUSION AND APPLICATION

This study tries to investigate how students designcomputer games as artifacts that reflected their understandingof game design. As similar to previous studies, our studyshowed becomes active participants and problem solvers bydesigning their own games. They also engage themselves insocial interaction by sharing their designs, help each other andtaking ownership of their own learning. [4]

Picture and video collection and results of student workboth individually and in groups, either in the form of sketcheson paper and in digital form. It is an evidence of the findingswe have obtained. Studies on individual students need to bedone to one group because of differences in ideas that triggereda significant impact on the design produced by the students.The way in which the design is inspired by the ideas andtransferred in

digital form can be seen through observation andinterview conducted.

The result of our study may provide some insights into theprocess used by students to develop computer games purposes.Some investigations of these finding for game design includethe following:

- Designing computer games helps to develop creativethinking to produce something meaningful.
- Designing computer games encourages a group of ideas that can be generated for the production of a good computer game.
- Production of individual ideas about a great impact inthe production of an exciting and meaningful design
- Clear instructions and collaboration within the groupto provide quality materials are important and need tobe addressed.
- Scaffolding involved in the process of designing and development does not only depend on the instructor but also to a group.
- Learning through design that can describe integrative, curriculum units and long-term valid in the target subjects

In this study, we also observed that gender differencesinfluenced the different ideas in terms of genre of computergames that they try to produce. For example, female studentswere more interested in producing the form of strategy game design, while the boys were to design the form of RPG andaction game even though there were a few male students whoproduce the form of strategy game.

ACKNOWLEDGMENT

REFERENCES

[1] A. Ibrahim and J. Azizah, "Game design framework: a pilot study on users' perceptionsLecture Notes in Computer Science (includingsubseries Lecture Notes in Artificial Intelligence and Lecture Notes inBioinformatics) 7067 LNCS (PART 2) , pp. 33-38, 2011

[2] A. Ibrahim and J. Azizah, "Games design and integration with user's emotion," in User Science and Engineering (i-USEr), 2011 International Conference on, 2011, pp. 69-72

[3] E. F. Anderson, S. Engel, P. Comninos, and L. McLoughlin, "The case for research in game engine architecture," in Proceedings of the 2008 Conference on Future Play: Research, Play, Share, 2008, pp. 228-231

[4] A. Baytak and S. M. Land, "A case study of educational game design by kids and for kids," Procedia - Social and Behavioral Sciences, vol. 2, pp. 5242-5246, 2010

[5] J. Flemming, "Down the HyperSspatial Tube: Spacewarand TheBirth of Digital Game culture." Available:

http://www.gamasutra.com[retrieved on 13 April 2010]

[6] L. Nacke, "Affective ludology: Scientific measurement of user experience in interactive entertainment," Ph.D PhD, Blekinge Institute of Technology, 2009

[7] J. Neilsen, "Visual Cognition and Multimedia Artifact" in O. Danielsen, J. Nilsen, and Holm-Sorensen (Eds) Learning and Narrativity in Digital Media, 2003

[8] J. Karat, & C. M. Karat, "The evolution of user-centered focus in human-computer interaction field," IBM Systems Journal. 42(4), 2003, pp. 532-541

[9] T. Gillespie, "Digital storytelling and computer game design," in CHI'97 extended abstracts on Human factors in computing systems: looking to the future, 1997, pp. 148-149.

[10] R. K. Yin, " Case study research, design and methods". 3rd Ed.Newbury Park. Sage Publication, 2002

Ibrahim Ahmad obtained his bachelor degree in Mathematics and Computer with educationand masters in Educational Technology from Universiti Teknologi Malaysia, Malaysia, Currently; he is a senior lecturer in Interactive Media Department at Universiti Teknikal Malaysia Melaka (UTeM), Malacca. Beside that he is also completing his PhD research at the Visual Informatics Institute, Universiti Kebangsaan Malaysia. His research interests include game design, affective computing and instructional technology.

Azizah Jaafar received her B.Sc, M.Sc and PhD in from UKM, Malaysia in 1979, 1993 and 2005. She is a Asscociate Profesor at the Visual Informatics Institute, Universiti Kebangsaan Malaysia. Her main research interests are in Human Computer Interactions (HCI), interface design and affective computing.