

# Easing the Creation Process of Game for the Non-Programmers: An GUI Application for Teaching Art Students

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## 1. Introduction

This paper evaluates the current development of GUI Game Engine and presents an overview of some of its application to merging game art design and programming, especially in the teaching field. The implementation of GUI Game Engine can help to transform the art creations into interactive multimedia design, and this is crucial and attractive to art designer and students. A number of game engines have come up that can be used to facilitate efficient Human Computer Interaction (HCI) and game development. By expanding the user types and market segmentation to non-programmer, GUI Game Engines achieve their business successes in game developer market. However, the application of GUI Game Engine is still lacking research work concerned with the connections among art design and game development..

## 2. The Concept

The paper lists a specific game engine, which is suitable for art students and discusses the implementation of their successful use as programming tools for non-programmers.

Beginning by looking after related studies that refer to issues about putting art students in control of their own learning and challenging them to master the complex process of making game. This paper introduces the Gamesalad Creator software and presents the context of our study.

Smeets (2005) once described “powerful learning environment” as which fosters better learning processes. In such learning environment, students actively engage in

learning task that meets their individual needs. Game making has the potential to play as a role of the powerful learning environment, since it offers students practical opportunities to exercise multiple skills like level design, characters design, visual design, story telling to accomplish a complex digital creation.

This study goes beyond the educational potential of playing games to consider the benefit of making games in teaching environment. As the process of making games includes playing games to test the outcome, therefore it can also be linked with developing skills of problem solving, decision-making, cooperation, and art design.

Developing a deeper understanding about the computing knowledge and being able to manipulate digital skills to create graphics, animation, and games has become increasingly essential especially to students of department of Digital Multimedia Design. Gamesalad Creator has a strong visual aspect and acts a game developing toolkit to reinforce non-programmers' skills on creating game, irrespective of their deficiency of programming ability. Gamesalad provides both drag-and-drop and GUI features that allow user to create game for various platform. This game-making tool has a fully developed visual environment and

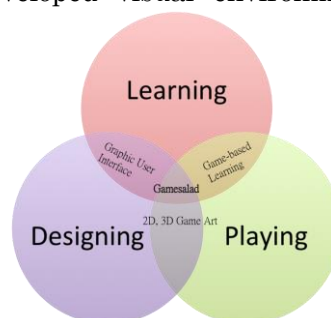


Fig 1. Concept Structure

provides the developer many ready features to develop game in simple and intuitive way. Therefore this study is encouraged to place this tool in the context of research on the potential of GUI based learning for art students to make games.

### 3. The Practical Projects

With the purpose of facilitating the development of games for non-programmers, various practical softwares had been created. Through some softwares user can create a game even if they have only initial programming skill, simply by dragging objects to the editing scene and determining characters' behaviors through editor menus in the GUI form. In this context, we choose Gamesalad to be applied in the research, which also dispenses developers from skilled knowledge of programming. In general, Gamesalad supports the development of games for non-programmers with following features: the GUI menu, the scenario editor, the drag-and-drop method, and event publisher. Thus, the user can create game objects by selecting their graphic representation from the library and determining proper behavior from a list of 36 options.

While game-making tools still stand as a barrier non-programmer, Gamesalad tries to implement no coding environment for making game and provides a flexible and visual interface to operate algorithms. Therefore, Gamesalad user can be released from programming. Making a game by using Gamesalad or any other game engines can actively engages learners in creation because they are using a tool to construct their own game, and it is not a passive experience. In the learning course, students learn autonomously using Gamesalad as a efficient digital tool to embody their creative ideas in a testable method, and then to evaluate their ideas by playing.

Through the practical learning outcomes (see fig. 2, 3, 4) have shown that Gamesalad does provide opportunities for art student to



Fig 2. Game designed with gravity function.



Fig 3. Game designed with art concept.



Fig 4. GUI and drag-and-drop applied in Gamesalad.

create acceptable 2D games. The art students in this study also show determination to achieve task, were able to learn collaboratively, and most of all, they also showed the capabilities and creativities of making game under the certain environment of visualized programming. Furthermore, with mobile game development, Gamesalad allow students to test their product on portable devices and receive direct feedback through Gamesalad Viewer. The interactive drag and drop game design method and the immediate visual interface designed by Gamesalad can increase art students' interest in computing, which is demonstrated by this study. The visual metaphor of programming languages, which aids in understanding algorithmic design principles, is found to be one of the

factors that contributed to increasing motivation. Art students were able to pick up basic game design concepts and actively learn through making game.

The Gamesalad uses an object-oriented, event-driven approach. When making a Gamesalad game, everything appears as an visual object. Thinking about creating games is correspondingly considering about game objects and how they react to the designed behavior and one another. So the Gamesalad creator is visually thinking an object-oriented way. All of these have equipped a friendly environment for art-specialized students to create game. Usually events occur for object action,

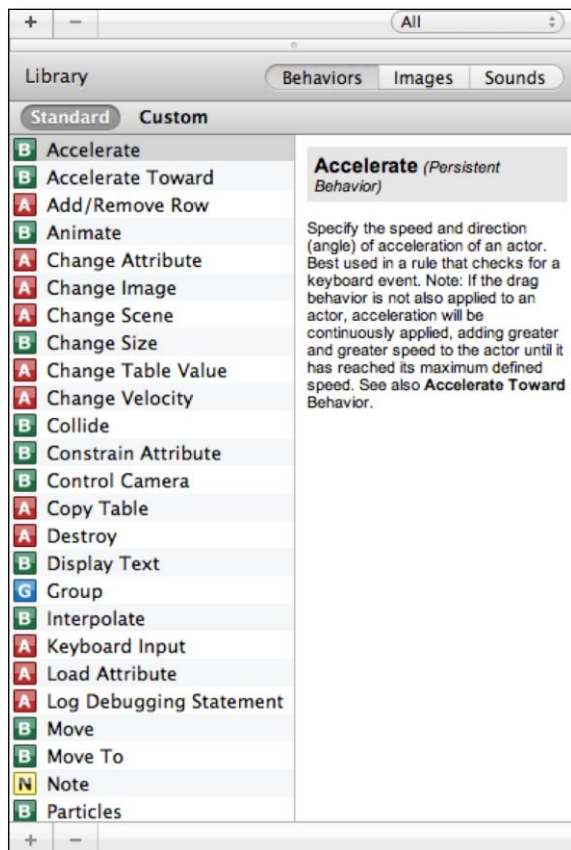


Fig 5. Behavior setting list in Gamesalad

creation, and destruction. To achieve this, the game designer can easily drag and drop behaviors and attributes into events. Gamesalad users will find this to be a efficient mechanism that leads them intuitively to manipulate object-oriented

programming with the aids of exclusive GUI interface.

This study presented Gamesalad, a multi- platform game engine to develop 2D games, which can eliminates the need for programming knowledge. Through a simple and intuitive interface, users are supplied several ready features, plus a simplified object creator and editor of purely visual events. It is obvious that this visualized game engine provides art students the opportunity to present their creativities and art creations in form of mobile game. It can leverage students' engagements in mobile game technology and games, since Gamesalad component can integrate their ideas and art works. For the research purpose, we aim to examine whether students can apply their graphic works into the game projects through Gamesalad. Taking into consideration the deficient coding skill of art students in general, this simply game making tool is qualified to be used to implant skills and concept of logical thinking, problem-solving relevant to game making.

#### 4. conclusion and future Works

In conclusion, this study suggests that game-making procedures, which are designed as a visualized programming method, can serve as a medium along with an active learning pedagogy to offer a game-based learning environment to train student in creative thinking. After all, developing a game requires creativity.

In this research, we also present our findings of GUI Game Engine in achieving interoperability between game art design and programming, and building cognitive schemes to enhance the learning of gamification on art designs. We expect this research to extend the adaptability of game development in art design education. This study presented the Gamesalad, a GUI form of game-making software to develop 2D games for multiple platform, is suitable for art students to develop game. Through a

simple and intuitive interface which the various ready features are provided, plus a simplified object creator and editor in purely visual form, the purpose of tools that enable the development of games for non-programmers have been achieved.

### References

- 1) Ahmad, K., & Gestwicki, P., “Studio-based Learning and App Inventor for Android in an Introductory CS Course for Non-majors” SIGCE '13 Proceeding of the 44<sup>th</sup> ACM technical symposium on Computer science education (2013) p. 287-292.
- 2) Dekhane, S., & Xu, X., “Engaging students in computing using GameSalad: a pilot study”, *Journal of Computing Sciences in Colleges*, 28(2) (2012) p. 117-123.
- 3) Roberson, J., & Howells, C., “Computer game design: Opportunities for successful learning”, *Computer & Education* 50 (2008) p.559-578.
- 4) Smeets, E., “Does ICT contribute to powerful learning environments in primary education”, *Computers and Education*, 44(3) (2005) p. 343–355.
- 5) Uludag, S., Karakus, M., & Turner, S. W., “Implementing IT0/CS0 with Scratch, App Inventor for Android, and Lego Mindstorms”, *Proceedings of the 2011 Conference on Information technology education* (2011) p. 183 -190.