Learning by Game Building: Implementing Bagh Chal Using JADE

Dr Michael Lance
Christchurch Polytechnic
Institute of Technology
Michael.Lance@cpit.ac.nz

Mike Lopez
Christchurch Polytechnic
Institute of Technology
Mike.Lopez@cpit.ac.nz

Amitrajit Sarkar
Christchurch Polytechnic
Institute of Technology
Amitrajit.Sarkar@cpit.ac.nz

Rob Oliver
Christchurch Polytechnic
Institute of Technology
Rob.Oliver@cpit.ac.nz

ABSTRACT

JADE is a 'squiggly bracket' scripting programming language developed and supported by JADE Software [1], located in Christchurch, New Zealand. It contains its own embedded data base and is best suited for developing commercial business applications. Here at CPIT (Christchurch Polytechnic Institute of Technology) we use JADE as the main programming language to teach students Introductory Programming at a stage 1 level in our Bachelor of Information and Communication Technologies (BICT) degree. JADE is also the language used in the second stage 1 programming paper. Both courses introduce students to common Computer Science concepts by referencing to gaming problems. The practical aspects, functionality and usability of a programming language such as JADE being used to develop computer games is researched by the authors of this poster. The board game Bagh Chal was selected as the game to attempt to write in JADE. This game has previously been written in Python[2] and Javascript[2]. Bagh Chal is a traditional board game of Nepal [2]. Subsequent to this research the development of the Bagh Chal game was given to students studying the second stage 1 programming paper as an assignment (partial JADE code was supplied).

KEYWORDS

JADE, Bagh Chal, computer games, programming,

1. INTRODUCTION

We are trying to teach JADE differently to how the constructivists have done it in past. Academics have started questioning the constructivist way of teaching introductory programming and challenging the basic premise, that putting introductory students in the position of discovering information for themselves is a bad idea! [3].

2. METHODOLOGY

As educators, we were involved in performing the following tasks:

- Discussing the Game Rules and then playing the board version of the game with a group of students.
- Discussed the logic and designed the solution with pen and paper first. We then developed code segments to experiment with the JADE syntax to see how the language performed in the gaming environment. The game code was then developed by three teams each using an entirely different approach.
- Finally, ideas and code were merged from all three teams to create a working model.

3. CONTENT

As a result of the author's research, students studying the second stage 1 JADE programming paper were given an assignment involving the writing of the Bagh Chal game in JADE. Some code segments were written given to them at the beginning of the assignment. The scope of the tasks involved:

- Examine how an existing system works.
- Make a plan using dynamic modeling techniques.
- Create and call user defined functions and operations.
- Use Jade's IF and WHILE constructs.
- Create a test plan.
- Enhance the GUI.

The Bagh Chal code given means the game *almost* works, but has been written with much duplicate code and a bare minimum user interface. Tasks given to students were:

Code: Write the code to make it work.
Refactoring: Rewrite the code to remove as much duplication as possible.
GUI: Enhance the existing or add your own graphical user interface.
Algorithm: Define and implement missing algorithms.
Testing: Plan scenarios that will test your code.

4. CONCLUSION

Our preliminary observation confirms that games are a powerful medium for learning programming. We also observed that Game-Based learning has impacted positively on these following attributes of learning:

- Participation
- Engagement
- Relevance
- Confidence
- Satisfaction/Fun
- Game Designing
- Meeting the Learning Objectives
- The attachment of the JADE database to JADE objects has been a major obstacle in the code development.

The outcome of our research has been the development of an assignment for students studying the second stage 1 JADE programming paper (partial JADE code was supplied).

5. REFERENCES

[1] Jade Software, 19 Sheffield Crescent, Russley, Christchurch 8053. , 2006

[2] http://www.findbestopensource.com/product/baghchal

[3] Kirschner, P. A., Sweller, J., and Clark, R. E." Why minimal guidance during instruction does not work: an analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching." Educational Psychologist 41 (2)   p 75-86