PLATFORM FOR EDUCATIONAL GAMES GENERATION

André Gomes Barbosa

Project/Dissertation developed under supervising of Ana C. R. Paiva

in Faculdade de Engenharia da Universidade do Porto

1. Motivation

While software tests are seen as quality measures, testing techniques are still rarely applied by software development companies. This factor might be caused by lack of qualified and available professionals to implement these techniques. This is a problem that affects not only software testing but also other areas that have a special need for highly competent personnel such as healthcare and business management. In order to surpass this recurring problem a new type of learning platform capable of adapting to each area's procedures is needed. This platform's purpose would be to generate educational games which should not only be easy to understand and utilize but also stimulate the learning process in a more pleasant and enjoyable manner.

2. Main Goals

The main goal of this research work is to provide a proof-of-concept of a platform that allows users to learn the respective contents at their own pace and in a fun, motivational way. These sorts of measures should be reassuring for people entering the work market, where one's knowledge is of utmost importance. This platform is capable of generating educational games based on content loaded from a separate XML file. This research work is also an improvement to the non-functional requirements of a software testing game named *iLearntest*, which we use as foundation for our platform.

3. Work Description

The approach for this project was mainly to change the previous implementation of *iLearntest* into a more dynamic one; for instance, reading the set of problems from a XML file which would be separated from the game implementation. The main idea is to have a set of game templates that can read the content of the exercises from the file, so that we can use the same game for the learning process of a variety of themes. This solution allows a platform capable of loading content into *iLearnTest* from XML via AJAX requests, in order to ease future updates and development of the tool. For the development of the project we used Construct 2, a game development framework.

4. Validation Method

When addressing the validation of results, one must consider the validation of the tool as a dynamic framework for creating games of the sort. The idea is to take each one the implemented games and apply them to other possible contents whether it is software testing or other specific areas. In order to validate the platform as a development framework, a small experience was performed using both the Construct 2 and the developed platform. This experience consists on a simple exercise where the users separate uppercase and lowercase letters in two different boxes. The results were the following:

Tab. 1 – Validation Results

Time	Platform	Construct2
Installation	1 min	2 min
Learning	4 min	20 min
Implementation	4 min	22 min
Total	9 min	44 min

5. Conclusions

Based on the validation results we conclude that:

- Construct 2 has a steeper learning curve than the developed platform. On the other hand, a XML-based approach is more intuitive and eases the maintenance of the game and its content;
- The division of the content from the game engine is beneficial considering the time efficiency of the new approach;
- The effectiveness ratio of the new platform is satisfactory and is expected to scale with a task's difficulty, provided that the platform contains a template capable of handling said task.