A GAME TO SUPPORT SOFTWARE TESTING EDUCATION

This briefing reports scientific evidence on the use of the AIMED method to describe and analyze the development of an educational game to support software testing education.

FINDINGS

The aim of this paper was to describe and analyze the development of the **Testing Game** using the AIMED method.

- **Organizational Processes:** In this process, we identified the view of the product regarding to licenses, modules, interfaces. Besides that, we defined the license of the game and the repository to store the source code of the game.

- **Pre-Production Process:** In this process, we defined the initial planning which contains two activities: definition of pedagogical and technical requirements.

  In addition, we established the target audience, which is undergraduate students, software testing contents and the assessment performed to evaluate the quality and usability of the **Testing Game**.

- **Production Processes:** In this process, we organized the description of the game into three interactions which correspond to test techniques, such as Functional Testing, Structural Testing and Defects-Based Testing.

  For each interaction, we applied the Analysis and Planning, Iterative Project, Incremental Implementation, Integration, Testing and Review of artifacts.

  We planned the phases of the game and selected the artifacts of the repositories available in the internet to use in the development of the game. Finally, we implemented and integrated the selected artifacts in each interaction.

- **Post-Production Processes:** In this process, we defined the environment in which the game is hosted, named as Scirra Arcade server. It is important to highlight that the **Testing Game** is ready to be used to support software testing education. However, it should be highlighted that it has been used so far only for the game evaluation.

- **Support Processes:** In this process, we evaluated the generated artifacts to be used in other iterations. We also performed a feasibility study to evaluate the quality and usability of the **Testing Game**.

Through the description of the game, we identify some positive aspects, such as:

- The definition of the game's scope since the techniques and test criteria that should be addressed in initial planning.
- View of product (license, modules, interfaces) well-defined.
- The source code available on repositories.
- Additional modules available with the theoretical contents addressed in the game.
- Establishment of open source license for the game.
- Definition of software testing contents addressed in each level.
- Easy access to the game by means of a link.

Despite the positive aspects raised, we identified some points that can be revisited in the next version of the game, such as:

- Prioritization and revision of artifacts.
- Lack of tutorials to support students in the use of the **Testing Game**.
- Lack of an established requirements list.
- Lack of game tutorial for students to use of the game (i.e., screens, menus, functionality, phase, commands),
- Lack of division of roles in the game development.
- Lack of an initial planning with the main risks.
- Lack of an experiment to assess the students learning after they play the **Testing Game**.
- Do not save students information in a database.

Regarding we have used the AIMED method to describe the game some improvements need to be considered for the method upgrade:

- Provide support the development of educational resources with geographically distributed development teams.
- Establish during the activity for licensing the educational resource a list of the main licenses for educational resources.
- Define a list of suggestions of tools to support the development of educational resources during the programming activities.

Through the results, we intend to solve the identified problems and conduct a case study, applying this game in a software testing course, to evaluate students' performance in this context.

We also intend to consider the implementation of new features to integrate software testing tools into the **Testing Game**, allowing students testing their programs inside the game environment.

Who is this briefing for?

Software engineering practitioners who want to make decisions about the use of the Testing Game to support software testing education based on scientific evidence.

Where the findings come from?

All findings of this briefing were extracted from the use of the AIMED method to describe and analyze the development of the **Testing Game** conducted by Valle et al.

What is included in this briefing?

The main findings on the development of the **Testing Game**.

Evidence characteristics through a description of the game, identifying positive aspects and limitations in the game.

What is not included in this briefing?

Information about the phases of the game, the contents addressed and results of feasibility study.

To access other evidence briefings on software engineering:

http://www.lia.ufc.br/~cbsoft2017

For additional information about

http://www.labes.icmc.usp.br/site

ORIGINAL RESEARCH REFERENCE

Valle, P. H. D., Rocha, R. V., & Maldonado, J. C.; Testing Game: An Educational Game to Support Software Testing Education. In Proceedings of the 31st Brazilian Symposium on Software Engineering (SBES) @ VIII Brazilian Conference on Software: Theory and Practice (CBSoft 2017), Fortaleza, 2017.