Authoring Tool for Interactive Video Content for Learning Programming

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Abstract

One challenge in learning programming either by self-learning or in the classroom is the lack of interactive learning content. For teachers, authoring tool is a solution that can help them in designing materials with interactive video. For students, interactive learning materials will certainly increase interest and understanding of the material. Goal of this research is to build an authoring tool for producing interactive video to be run on the browser. The methodology used was the RUP (Rational Unified Process) which consists of Inception, Elaboration, Construction, and Transition phases. Result of this study is an authoring tool application for designing and producing interactive video and generating it to HTML5 platform. Conclusions obtained are the authoring tool can help teachers to design teaching materials in the form of interactive video, and use it in teaching and learning process to increase students understanding of material.

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Keywords: authoring tool, interactive video, learning programming, learning content

1. Introduction

Programming is a basic skill that must be mastered by Computer Science students. Generally, they are introduced with the popular programming languages and widely used in industries. However, programming is generally regarded as a difficult course and often becomes a factor of high dropout rate 1 2 3. In addition, some studies have shown that

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there are universal problems in teaching and learning programming languages. Although the provided materials are a lot, sometimes it cannot resolve the problems to make students understand. Based on the Codepolitan survey, there are several challenges faced by students when learning a programming language. These challenges such as difficult to understand algorithm, too many programming languages to be chosen, learning tool is less supported, less ability in English, the absence of a mentor and should do self-learning, and difficult to understand and memorize the syntax. Although there are a lot of tools to learn programming today such as forums, e-books, video tutorials, and Web-based applications (such as Codecademy and CodeSchool), students still have difficulty in learning programming. Thus, learning to program is a challenging and complex process that requires the support of appropriate educational tools.

Lately, the increase use of digital equipment with PC devices and gadgets happening in the world. The tools are frequently used in the field of education, both in the way of individual and group. Improved digital equipment offset by the advancement of web technologies. Web becomes essential for online education, started from reading the text in the browser, and then backed up by another media such as audio and video. With such developments, students will no longer passively absorbing content but can create learning deepening.

E-learning is one example of the use of technology by using digital devices and the web. E-learning is a concept derived from the use of information and communication technologies to revise and change the traditional teaching and learning models used today. Currently e-learning becomes an important part in teaching and is already widely used by teachers. The reason teachers use e-learning is that its features correspond with the needs, benefits, and costs. Authoring tool is designed specifically to make and facilitate e-learning. It is a program that helps the user to use hypertext and multimedia applications and allow the user to create applications simply by using a paragraph, text, illustrations, or audio. Thus, it can integrate a variety of media to create a professional, interesting, and interactive content.

To support this research, an experiment had been conducted to students at Bina Nusantara University to determine the effective digital content for learning programming by dividing the students into four groups. First group is control group that learn by traditional / face-to-face. Other groups are experiment groups that self-learning by using video, e-book, and combination of video and e-book. All groups had same average of GPA and same learning time. After the experiment conducted, the highest to lowest increment of score are traditional method, by using video, e-book, and combination of e-book and video. The conclusion of this experiment is that video is the most appropriate
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