SELF-ASSESSMENT INTEGRATION OF PROGRAMMING PROFICIENCY THROUGH MOBILE GAME FOR DCS STUDENTS

Undergraduate Thesis Manuscript

Submitted to the Faculty of the

Department of Computer Studies

Cavite State University – Imus Campus

Cavite

In partial fulfillment of the

Requirement for the degree

Bachelor of Science in Computer Science

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June 2022

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ABSTRACT

CASTRO, CARLO T., FETIZANAN, PATRICK JAMES F., and CRUZ, RENZO C., Self-assessment Integration of Programming Proficiency through Mobile Game for DCS Students. Undergraduate Thesis Manuscript, Bachelor of Science in Computer Science. Cavite State University – Imus Campus, Cavite City. June 2022. Adviser: Grace S. Ibañez.

Programming proficiency is crucial for Computer Studies students' since it is the one of the major requirement when studying in this field. One of the major problem that students' are facing is the lack of programming knowledge or insufficient knowledge in coding, it is important that every student must evaluate their learning progress in order to know which area in programming they need to focus studying. This study aims to develop a mobile game that will help students' track their programming proficiency anywhere and anytime. With the help of this study and the developed application, a student can assess themselves while learning some of programming knowledge that is integrated on the application. The study entitled Self-assessment Integration of Programming Proficiency through Mobile Game for DCS Students was developed at Cavite State University from December 2021 to June 2022. The application "ProgAss" is a mobile game with four modules namely; Game Module, History Module, Profile Module, and Tutorial Module. It is developed using C# language in Unity 3d 2019 application and Randomized Algorithm for the randomization of contents in Game Module.

All the functions and features of the application is carefully evaluated using ISO 9126 with one hundred (100) respondents. The evaluation results shows that the application is highly acceptable by the users with overall rating of 4.76. Based on the evaluation score, it is seen that the application has passed the required and acceptable criteria and can be used as a self-assessment for students' proficiency in programming.

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INTRODUCTION

Self-assessment allows the student to have a chance to self-evaluate and make judgments regarding the process and products of their learning, based on the allowed and recognized criteria. According to Andrade et al. (2009), Self-assessment is a process of formative assessment during which students reflect on the quality of their work, judge the degree to which it reflects explicitly stated goals or criteria, and revise accordingly. Students learning aptitude in programming must be evaluated properly to prove that they met the required skills and knowledge, assessing what students already know provides insight for them and their institution which part students are more knowledgeable and which they should focus on teaching.

With the digitalization of information, more institution uses digital devices to evaluate their student knowledge and proficiency. Mobile phones and other digital devices are widely used globally among teenagers especially students as the 21st-

century starts. Today, due to the global pandemic that we are now experiencing, new learning methods are being introduced to us with the use of the internet and digital devices. Online classes are now implemented throughout the country following the enforcement of lockdown and home quarantines. Students were forced to study at their home without the proper guidance of their instructors. Research shows that studying online has different effects on students and one of these effects is the lack of knowledge in a particular subject area.

Programming proficiency is crucial to every student that studies in the Department of Computer Studies. Based on International Data Corporation, nearly 49% of the jobs that pay a six-digit salary require some coding skills but based on the analysis there are only 0.5% of the population knows how to code. For young students, programming not only helps them to prepare for the future but also helps them to gain problem-solving skills and critical decision-making. It enhances their thinking ability and enables them to think logically, strategically, and analytically.

Republic Act No. 9115, Section 2 states that; school shall be the heart of the formal education system. It is where children learn. Schools shall have a single aim of providing the best possible basic education for all learners. That is why assessment is an important activity that students should undertake to know if they acquire knowledge from school, especially today when all lessons are being held online and lectures are distributed digitally. Moreover, with lack of assessment, it is difficult to identify if students are learning what their institution and teachers are expecting them to learn. Mobile assessment using applications and games are a new delivery modes of assessment that offers ubiquitous access to testing material anytime and anyplace. Due to its mobile features, it has the potential to complement and enhance other assessment delivery modes i.e. paper-and-pencil based or computer-based assessment (Nikou & Economides, 2014).

The proponents believed that every student must be familiarized with basic programming knowledge in their first year as a college student. Since most of the time students use their mobile devices from time to time, it is a good opportunity to develop an application that is helpful to them to test their knowledge about programming. The main objective of this study is to help them track their learning progress using a mobile game that can be accessed anytime and anywhere using their mobile phones.

The success of this study might be beneficial to both students and instructors. Students will be able to recognize what they already know and what needed to focus on studying. It can be used as a reference for the instructors and institutions regarding their students' expertise in programming.

Statement of the Problem

Programming skills are one of the most important things Computer Studies students should possess. All students must learn basic knowledge about programming for them to understand how coding works. Since students are studying at their homes without teachers monitoring them personally, they must know their progress in learning programming. *How will the assessment help the students determine which part of programming they are more knowledgeable about?*

Another problem that students in Computer Studies are facing is the lack of enough programming knowledge. Most of the time, students only study what their instructors ask them to do. The proponents believe that they must have the basic skills in programming that they might need in their following years in college such as troubleshooting, writing code, and mastery. *How will students gain basic knowledge about programming from playing the game?*

Many students have difficulties in balancing their studies and their day-to-day lives and some of them are working while studying. It is believed that giving them chance to assess themselves will be more effective and helpful at the same time. *How*