

Game development learning with PBL approach as a tool to assess computer engineering competences.

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Abstract

This paper presents strategies for a Game Development course that aims to develop hard and soft skills in computer engineering students. There is a focus on soft skills that are considered essential for success in the 21st-century professional world. The design for this course is based on the Project-Based Learning approach, which allows students to explore different techniques and encourages creativity, while still having clear objectives and pre-defined milestones. The article discusses the use of continuous monitoring, peer assessments, and the Agile project approach to evaluate student progress and ensure that each student experiences different roles in project management.

Keywords: Game Development; Project-Based Learning, Soft Skills, computer engineering

1 Introduction

It is increasingly important for professionals to be prepared, not only in teach technical skills, commonly called hard skills but also in the skills known as soft skills, considered essential for the 21st-century professional (Sreehari, 2021). However, while hard skills are simpler to evaluate, soft skills present a much greater challenge, due to their qualitative and indirect nature (Yousef, Elzamy, Doheir, & Yaacob, 2022).

With these challenges in mind, an undergraduate Game Development course has the environment to bring a holistic approach to the student, with a curriculum designed to develop and reinforce the various skills expected of computer engineering students. The designed course proposes to go through the entire game production pipeline, starting with board games and moving on to 2D and 3D video games. Throughout this journey, students are presented with various content and skills that will eventually solidify into professional competencies. This course was designed based on the proposal of Project-Based Learning, which presents students with a base project, with a defined time and scope, but still encourages creativity so that they can carry out different proposals and explore various techniques freely (Salibi, Machado, Rodrigues, Souza, & Campos, 2021).

As the field of Games Development is broad and the creation of a functional prototype is complex and requires various skills, each project is presented with clear objectives aimed at developing the skills considered necessary for progression in the course, with pre-defined milestones and regularly evaluated through continuous monitoring and peer assessments

The proposed continuous monitoring follows the Agile project approach (Beck, et al., 2001), in which each group must define various project points and tasks to be completed by the next week. During these meetings, professors have the opportunity to evaluate various aspects of each student and the group as a whole. In the final projects, there is a rotation of roles among those pre-defined for project management. The objective here is to ensure that each student has a complete experience in each of these roles, further encouraging the development of the necessary soft skills for the project to be delivered on time and with quality (Duch, Allen, & Harold, 1997).