Reinforcing Student Understanding of LinkedList Operations in a Game

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In Partial Fulfillment of the Requirement in

Data Structure and Algorithm

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Title of the Research

"Reinforcing Student Understanding of LinkedList Operations in a Game"

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Statement of the Problem

According to researchers, they observe that over the years Students are always struggling when it comes to Linked List but others can easily understand different data structures like concepts of Stack and que data and also Researcher said that based on their experienced of teaching Data Structures linked list is the one of those topics that Students struggling the most. that's why they focus more on to help student struggling in Linked List. So to addressed that problem they see that the possible solution is to produce learning app with linked list features because they said that Learning difficult Programming concepts in games will create high levels of understanding and excitement about programming and it will ultimately help students to improved their performance.

So in overall The statement of the problem in the paper is focused on the research question of What is possible way of teaching they need to do?, Is that way of teaching can help the programming performance of a student? The problem also includes the goal of evaluating the potential impact of this game on student learning by doing pre-test and post-test.

Author's Purpose

The purpose behind developing the learning module or app Space Traveler is deeply comes from addressing the problem faced by Students which is the difficulty or struggle to understand the topic Linked List. I understand That learning Can be difficult and I know how hard it can be to understand this since I am also Student who has Data Structure subject as one of My Major. The researchers aim to create an engaging and dynamic learning experience that goes beyond traditional teaching methods. Because They recognize that students always struggling with understanding linked lists, and producing game-like Space traveler elements into the learning process that can help to enhance comprehension and make it easier for students to gain knowledge about complex programming concepts. By leveraging the appeal of a game, the researchers want to create an interactive learning experience that may captures students' attention and motivates them to play and learn and also The goal of this research is not only to improve student performance in programming but also to create a positive and enjoyable learning experience that encourages students to continue exploring and developing their skills in this field, and also better motivates them to learn this difficult Data Structure concept and master its operation algorithm such as insertions or removals of nodes

Approach/method

the research approach involved designing and implementing the game module, conducting assessments through pre-test and post-test, and gathering feedback from students through surveys. The learning app was developed using a Game Maker Studio which is an environment that allows for foster game creation through drag and drop and GML scripting language. The paper's approach involves creating and implementing the Space Traveler game module to tackle the difficulties students encounter when learning about linked list operations. This module is designed to offer a game-like educational setting that

facilitates the mastery of linked list concepts. To test its effectiveness, the approach includes the development of a pre-test, post-test, and lab assignment to measure student learning outcomes. The game's educational features encompass four levels of tutorials, guiding students through basic game controls, insertion at the front, insertion at a specific location, and deletion. The game provides pertinent feedback and allows students to access tutorials during gameplay for additional support. The module's impact on student motivation and learning is evaluated through a survey, with initial results indicating promising outcomes and positive student feedback.

Conclusion

The paper concludes that the Space Traveler game module, which was specifically created to teach the concept of Linked List in an engaging and interactive way of teaching that has demonstrated encouraging outcomes in enhancing student learning. The assessment results clearly indicate that students exhibited a greater comprehension of Linked List operations after engaging with the game. The feedback received from students was all positive, with numerous individuals expressing that the game significantly boost their understanding of the subject matter. The Space Traveler game module successfully transformed the learning experience by making it enjoyable and captivating, making students to grasp the difficulty of Linked List more effectively. The addition of gamification elements which is the process of adding games in educational modules has proven to be a valuable approach in promoting active learning and student engagement. By combining entertainment and education, the Space Traveler game module has emerged as one of a powerful tool for educators to facilitate the learning process and foster a deeper understanding of complex concepts such as Linked List, though it's a research Study yet but base from the findings or result, it will be one of the powerful someday. The findings of this study highlight the potential of game-based learning as an effective Teaching strategy, offering educators a promising avenue to enhance student learning outcomes of Student.

Synthesis

A linked List is a non-contiguous data structure composed of nodes and Each nodes contains compartment and one or more link compartment. As what the researchers said Linked List is the type of Data Structure where the student has struggled the most. And that is why Researchers focus more on Linked list. The Space Traveler game module presents an innovative approach to reinforcing student understanding of linked list operations. Developed to address the challenges students encounter when learning about linked lists, the module provides a fun environment for visualizing and mastering important linked list operations. Through a pre-test, post-test, lab assignment, and through survey the module aims to evaluate its impact on student learning. Initial assessment outcomes demonstrate promising results, with positive feedback from students indicating a better understanding of linked lists after engaging with the game. The game's design and implementation, created in Game-Maker Studio by undergraduate students, offer a tutorial and gameplay time of fifteen to twenty minutes, making it accessible to all students who struggling also in Linked list, and while enjoying the features of app they will gaining knowledge as well. The module's availability on the project website further extends its potential to benefit students at other institutions, providing instructors with a valuable tool to engage students in the learning process and make mastering linked list concepts an enjoyable activity.

Reference

Reinforcing student understanding of linked list operations in a game. (2015, October 1).

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