Learning Object: Quiz-O-Matic 5000

Michael Young
4245718

Abstract

The overall task of the learning object was to teach and test mathematical concepts at a specific grade level. The grades I aimed to focus were grade 9 and grade 10 at the Academic level. The grade 9 information is more towards the material found at the end of the grade 9 course. I found the transition from end of grade 9 into grade 10 ti be smooth and flow nicely with the material. The information for teaching material was found in The Ontario Curriculum, Grade 9 and 10: Mathematics[1]. Please note that I do not plan on becoming a teacher, I chose the learning object because I already came up with these ideas for the project and thought the best way to apply them was to choose to do learning object.

I. Introduction

I.a Purpose and Background

The purpose of this program is to help educate grade 9 and 10 students in certain areas of mathematics and to educate students the basics of more advanced mathematics. For the grade 9 level these areas include, functions, expressions and equations, and equations of a line. For the grade 10 level the areas that are focused are factoring, properties of quadratic equations(including transformations) and solving quadratic equations. Due to time constraints, I didn't add everything I wanted. My initial plans and design for the project involved a lot more teaching material and features than I had time to add. Therefore, the lessons are only focused on certain subjects in mathematics. A lot of the information I didn't get a chance to show is already needed in order to do some of the lessons, however the student *should* know what to do.

II. Main Program

II.a Summary

The program consists of multiple forms and multiple user control boxes that are controlled through panels in the main forms. The main forms consist of the main screen form, the quiz form, the function fun form and the lessons form.

II.b Quiz

The quiz tests the students knowledge of the material that is taught through the lessons. It is recommended, although not necessary that students read the lessons first. The quiz consists of 10 questions, each question having a choice of 4 multiple choice answers. After the 10 questions the user is displayed a screen that shows how many question they answered correctly out of 10. I wanted to add the option of seeing which questions they got wrong, but I simply ran out of time and I figured it wasn't that important to have. I also wanted to split the quizzes up to have one dedicated solely on grade 9, and another quiz for grade 10. Again, time constraints.

II.c Lessons

The students are supplied 6 lessons, split equally for grade 9 and 10. Each grade gets a 'Recall' which is a quick run through of some of the basic knowledge they should already know going into the lessons. There was a lot of material from the curriculum I excluded, including a lot of in-depth analysis of quadratics and how they can be applied to word problems to solve for min and max values. My goal wasn't to teach students everything about quadratics, but more on what the different types of functions look like and how they can be transformed by changing the values. I think that if students understand these basics, it will help them greatly in later years.

II.d Function Fun

This was a little idea I got during the chaotic systems lab. Here the students can change the parameters for a series of functions and they are shown the graph and they can see for themselves how the values change the shape of the graph. The functions include; equation of a line(y = m*x + b), quadratic equation in standard form and quadratic equation in vertex form.

II.e) 5 Special Features

1)Function Fun
I thought this was a clever idea. One reason is because it's a great teaching tool to help students visualize math and see the correlation between the numbers and the behaviour of the graph. My initial goal for function fun was to include sliding bars and more user friendly interface for manipulating the values of the functions, but I was rushed for time. This would be the first thing I would change. Overall though I though it was a good idea and is worthy of extra credit.

2)Bonus Question
Spoiler Alert There is a bonus question at the end of the quiz. It's a little something I decided to add to put some humor in the program and to show that math doesn't have to be boring!

3)Recall For Grade 9 and 10
Simple review can save someone hours of confusion on some problems. I thought it would be a good idea to give a simple review, which kind of acts as an introduction to the material they will be learning. The recall material simply consists of material I thought students should need to know in order to solve the problems in later lessons. I did leave some material out, I couldn't cover it all.

4)Quiz
The quiz I though was an excellent way of testing the material I taught them to example problems. I didn't want to make the quiz too difficult, but it does check student's understand of the basics.

5)User Interface
My aim with the user interface was simplicity and consistency. There's nothing worse then a program that has a crazy user interface that changes all the time. I didn't want to clutter it up too much, but I also wanted to spice it up a bit.

III. Observations

Since I chose to do learning object, I needed at least one student of the appropriate grade level. I didn't have access to a grade 9 or 10 student so I got my friend Terry Knox to experiment with the program. It worked surprisingly well. It turns out he forgot a lot of the material anyways, and he took the quiz right away so it was almost as if a student of that level was taking it. It was great having someone else use my program because mistakes were found that I would have never noticed. Mistakes just in the questions themselves and conflicting answers and such. By the end of the quiz, Terry commented, "It accurately tests my grade 10 knowledge". His score(with his permission) was 8/10 + the bonus question was correct. So he still got a couple of the questions wrong, showing the quiz isn't too simple, yet easy enough for the average student to do well.

V. Summary

Overall I think the program has potential to give students an alternative way of learning about basic functions and behaviour. With more time, I think this program can be added to and changed to be a great teaching tool.

VI. References

[1] *The Ontario Curriculum, Grades 9 and 10: Mathematics, 2005*