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Student Portfolios in College Algebra

The concept of utilizing student portfolios will provide more structure and an improved overall theme to current coursework in my sections of College Algebra, Math 112. With a change in textbooks this past fall, I incorporated group work and in-class activities to the course during that semester. The fact that these “projects” were not assessed formally for that term was problematic to the students and me. This led to the idea of a “Chapter Project” associated with each section of material from their five in-class exams (not including the final exam). Typically, I would choose one or a few of the in-class problems used throughout that chapter for the students to submit formally. The five Chapter Projects together held the weight of one in-class exam grade.

From our discussion in the Faculty Teaching Certificate Program, the concept of a student portfolio seemed to improve upon the ideas that I was striving for in the Chapter Project assignments. It will allow a more systematic assessment of progress throughout the semester both in knowledge of mathematics and the ability to communicate mathematically. The portfolio will also require students to take control of their learning while practicing the necessary life skill of presenting material in a professional and cohesive manner.

Some of the main modifications that I am making to my current practice include incorporating a more holistic theme to the project, requiring more student responsibility and a assessing according to standard instrument.

1. Holistic Theme:

The College Algebra course material is now taught from a function-based perspective. The book is organized with each chapter more or less as a discussion about a different “family of functions”. Linear functions are taught in Chapter 2; quadratic functions in chapter 3, and so on. Therefore a main component of the portfolio will be to discuss the important features or characteristics of each type of

function. As a whole, the portfolio will give the students the opportunity to compare and contrast each of the important types of functions which we study.

2. Student Responsibility:

Previously, I selected the problems which were assessed. The students will now be responsible for choosing a particular example for each type of function and discussing their choice as well as solving it mathematically. They will be free to choose from any in-class activity or homework problem.

3. Standard assessment:

The tentative rubric is included at the end of this document. It focuses on two main areas which are stressed throughout the rest of their coursework as well: correct mathematics and clear explanations. The three part scale is also familiar to the students as it is the method by which I grade homework.

Each “page” is worth between 0-20 points according to the rubric. It is yet to be determined how many submissions will be required during the semester but the portfolio as a whole will have the same weight towards the course grade as one in-class exam.

It will be important to incorporate the compilation of this project throughout the entire semester. As before, I would set due dates for each type of function shortly after it was covered in class or by an exam. In that way, I could more readily see improvement and the students will receive feedback on a more continual basis. This pacing would also spread the workload more evenly for the students and me rather than assigning it as a cumulative project for the end of the semester.

At this time, I am unsure if I will allow a “page” to be redone if it initially is done poorly or not turned in. The optional topics or discussion of additional types of functions could be included by students who wish to increase their point total for the project. These matters will need to be decided prior to the semester and stated in the syllabus.

Material to be included in College Algebra Student Portfolio

The following types of functions are studied in College Algebra, Math 112:

- Linear
- Piecewise (absolute value)
- Quadratic
- Polynomial (cubic, quartic, etc.)
- Rational
- Root
- Exponential
- Logarithmic

For each type of function the following information should be discussed:

- Characteristics of the function (domain & range, rate of change, increase/decrease, etc.)
- Method of solving an equation symbolically
- Example of application

In addition the following items *could* be included in the portfolio:

- Discussion of the individual's mathematics background
- Reflection on how the student may use mathematics in his/her future
- Reflection on an opportunity in which the student explained mathematics to someone
- Personal final project utilizing data collection and modeling

Rubric for College Algebra Student Portfolio

	Score	Comments
I. Use of correct mathematics		
Vocabulary	0 1 2	_____
Concepts	0 1 2	_____
Computation	0 1 2	_____
II. Clarity of Explanations		
Organization	0 1 2	_____
Readability	0 1 2	_____
Diagrams/graphs	0 1 2	_____
III. Level of difficulty		
Explanations	0 1 2	_____
Examples/problems	0 1 2	_____
IV. Promptness	0 1 2	_____

Total: _____

Rubric Scale

0 Unsatisfactory / 1 Satisfactory / 2 Superior