

# INTERMEDIATE ALGEBRA "A GATEWAY/MASTERY APPROACH USING *SCIENTIFIC NOTEBOOK'S EXAM BUILDER*"

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## Introduction

Recently, a lot of attention has been given to Gateway/Mastery approaches in teaching courses [1]. In using these approaches, it can be very time consuming for the teacher to write multiple versions of exams and to grade the extra exams that may be required for students to master the material. To this end, a possible solution is to make use of computer testing for generating multiple versions of a single exam and for grading the tests. *Scientific Notebook's Exam Builder* [2] has the capabilities to do these things but it is not capable of being run on a local area network (LAN). It can be run over the web for an on-line testing environment, but for a more controlled environment, such as use in a single computer lab, some improvements need to be made.

## The Improvements

Since *Scientific Notebook* already has the capabilities to write exams using algorithmically generated questions using a random number feature, it is ideal for a gateway/mastery environment. However, one major reason that prevents faculty from using an-online or web approach to testing is user authentication [3]. This can be overcome by using a single computer lab for the computer testing and putting the testing environment on a LAN where the lab monitor can check student ID's before logging them onto the exam.

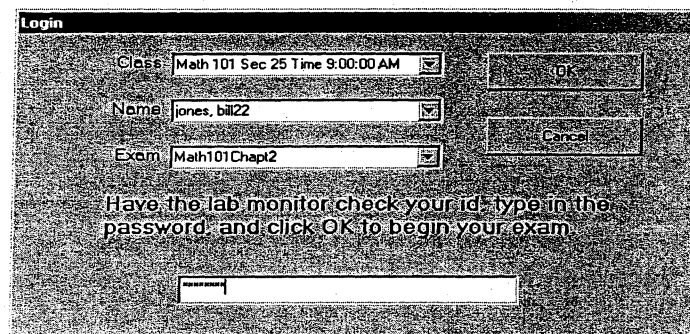


Figure 1. Initial Log-On Screen

The add-on package that was developed to allow *Scientific Notebook's Exam Builder* to have this capability was done using *Microsoft's Visual Basic* [4]. In Figure 1 above you can see the initial log on screen that was developed. Upon clicking the OK button the corresponding exam will be pulled up and the student will proceed taking the exam.

An add-on package for generating reports was also developed. Once students have completed their exams, the information is stored in a *Microsoft Access Database* [5] where a switchboard generates various reports on statistics of the exams taken. It is noted that the standard package with *Exam Builder* does track some information from the exam results but not as much as desired. In Figure 2 we see the switchboard with the various reports that can be generated.



Figure 2. Switchboard for various reporting options

Under each of the options above, another submenu will allow the instructor to choose between student, class, or section reports.

### Conclusions

The add-on packages that were developed worked very well in implementing a gateway/mastery approach in an Intermediate Algebra course that was taught for two different semesters at the University of South Dakota (F01 and Sp02). The implementation of computer testing allowed for more class time to be spent covering material and the students were more concerned with learning the material instead of merely getting through the course with the lowest possible letter grade allowed.

### References.

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4. *Microsoft Visual Basic®*, Microsoft, <http://msdn.microsoft.com/vbasic>
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