

Computer Assisted Learning - A Formative Approach

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Abstract

The delivery of higher education units of study is undergoing significant change with the increased emphasis and the adoption of a range of student centred learning approaches. The rapid growth of new technologies offers possibilities to learners and lecturers that were previously unavailable.

Computer based learning can increase the consistency, reliability and quality of student learning by focusing them on their learning objectives. It allows the student to work at the pace, time and location of their own choosing, with immediate feedback and evaluation of their learning outcomes. These factors optimise learning conditions and increase the flexibility of the learning experience.

This basic Economics unit was taught in the conventional manner with lectures and tutorials, and students were assessed in a series of six paper-based formal examinations throughout the semester. However, students were also provided with access to an on-line self-test environment using the Quiz Module of WebCT. An item bank of over 700 questions was prepared, based on chapter content of the course textbook, and made available to students week by week during the semester.

This paper outlines an example of large-scale on-line self-evaluation, and investigates the experiences and thoughts of a group of first year agribusiness students studying a new and strange subject in a new and unfamiliar environment.

Introduction

The subjects of this investigation were first year students studying the agribusiness stream from each of three separate degree courses, namely Agriculture, Horticulture and Aquaculture. The students were studying a basic economics unit as a compulsory component of their degree programme and most were fresh from high school. Some were part-time, mature age and/or working full time. The majority of students were studying the subject for the first time and most stated their reason for studying this unit was that it was compulsory and not because of any interest in economics.

Economics is a technical subject and requires a great deal of assimilation of new definitions, jargon, concepts and models which can prove confusing, difficult to learn, and seemingly irrelevant to students in the first year of their degree. Some way needed to be found to encourage students to learn the large body of basic theoretical economic concepts while still maintaining a positive attitude to their studies. This was not an easy task, given the negative initial attitude and lack of interest of the average student towards the subject.

Organisation of the Unit

Resources for the unit included a large (874 page) textbook and 150 pages of prepared lecture notes, which allowed students to spend the majority of the lecture time listening, without the necessity for making copious notes. The unit consisted of two major sections - Macroeconomics and Microeconomics. Each of these sections was further subdivided into three modules with each module based on four chapters from the unit textbook. Thus the unit was effectively broken into six separate modules, each of which could be completed as a "sub-unit" in two weeks. Each module was examined upon completion by an in-class hard copy 40-item multiple-choice test (60%) and two essay questions (40%).

Any student could make one repeat attempt at the multiple-choice section of each examination if they were not satisfied with their result. This arrangement allowed students greater flexibility by being able to work and learn at their own pace, and dispensed with the need for a lengthy final examination.

WebCT was used for delivering and administering the multiple choice quizzes. For each chapter of the textbook, approximately 30 multiple choice questions (with feedback) were placed in a single-purpose WebCT on-line unit. The class list was added to the on-line unit, and students were given Internet access via on-campus computer labs or from home. Thus the students could study each chapter of the text, then complete the 30 multiple choice questions in their own time, their own place, and at their own pace. Quiz marks and feedback were given immediately on completion of the quiz, and students could repeat the quiz up to five times.

To assist their learning, students thus had a fully modularised unit, a sequence of lectures with accompanying lecture notes, the text book, and a set of multiple choice questions with immediate feedback. This system forced students to learn as they proceeded through the course material. The usual method of "cramming" at the end of the semester was rendered useless, since there was no end of unit examination.

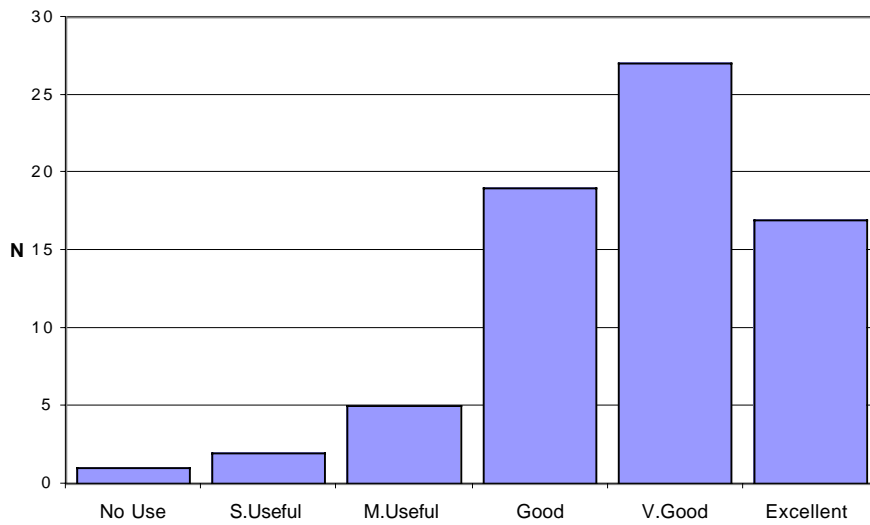
Results of the Student Questionnaire

Economics Survey 1999

Question	None	Slightly Useful	Moderately Useful	Good	Very Good	Excellent
1	1	2	5	19	27	17
2	0	1	4	9	27	30
3	2	2	2	13	23	29
	A	B	C	D	E	
4	64	0	3	1	1	
5	4	49	11	2		

Question 1 :Of what use to you are the lecture notes in understanding the unit?

Q1. Usefulness of Lecture Notes

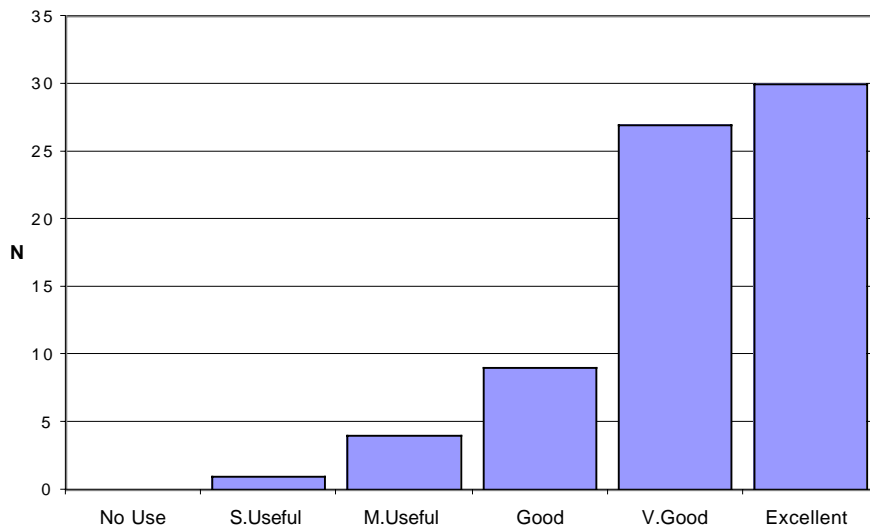


Student Comments for Question 1:

- Could go back over easily. Clear to read.
- Enabled us to read along during lectures and look back on after lectures.
- If we didn't have them we would be in big trouble.
- We go through them first and then you read them again to answer questions – Multiple Choice and Essays. A good use for revision.
- Excellent because we didn't have to take notes as taking notes affects your listening.
- An excellent idea because it simplifies the economic book and is easy to follow in class.
- They are a great, better, brief explanations to the text and a guide through the lectures.
- Help to study easily and quickly.
- It was about time someone gave us something useful.
- They saved heaps of time writing long notes down during the class and more time could be spent demonstrating the theory.

Question 2 :Of what use were the multiple choice questions to you in learning the material?

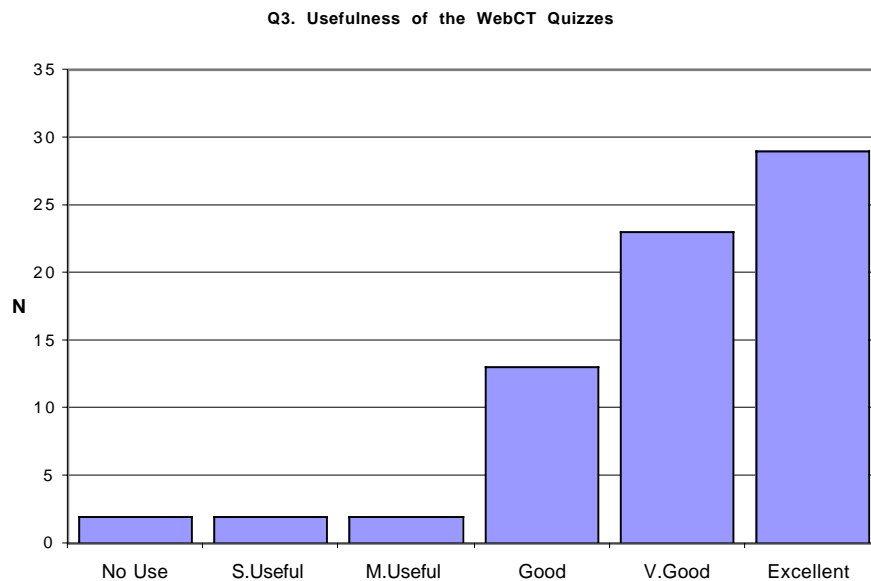
Q2. Usefulness of Multiple Choice Questions



Student Comments for Question 2:

- You could learn quicker because the answer was given which summed it up well.
- Helped to understand lecture notes.
- Makes it HEAPS easier.
- Tackling similar objectives from different angles help learning.
- Would have failed badly without them.
- They are quick and easy to remember.
- Guided learning and gave you a focus for private study (good review of lecture contents).
- Good to research answers as you are going through it – helps with knowledge of topic.

Question 3 :Of what use was the computer quiz and feedback to you for learning the material?



Student Comments for Question 3:

- This was of great benefit to us – success made easy and comments on incorrect answers are great.
- If answer was wrong it gave you feedback to help you in the future.
- A good way of testing ourselves.
- Helped focus study and give immediate feedback.
- Told you if wrong and WHY.
- Computer program was great for revising.
- Could check anytime – don't have to be in class. Easy to find answers quickly and feedback of where you went wrong was valuable.
- One of the best ways to learn through outside study.
- I really liked this because you could do it anytime and the feedback provided was really good.
- I found it helpful to do the tests on the computer after studying.

Question 4 :Which system of assessment is best for this unit?

Student Comments for Question 4, Answer A: "Six exams as now"

- Cannot have a final exam because there is too much to learn.
- It's great having 6 exams, relieves pressure at end of semester.
- Can concentrate on one exam at a time. Don't have to store huge amounts of information in your brain.
- You have to work the whole Semester not just one week as you could with a final exam.
- Great system.
- This probably covers more of the material.
- The way we do it now is excellent.

- The 6 exams is the best system, because you study as you go instead of studying in 1 clump at the end.
- This is the best learning method that I have found to suit the hectic uni. life.

Question 5 :This unit has been very structured. Your attitude to this system is?:

Student Comments for Question 5, Answer B: “It is of value to first year students to force study throughout the semester.”

- Going on the wide range of people here, this forces them to study and helps kick start some people who have been away from formal teaching.
- Allowed me to learn it bit by bit and be examined on it rather than having to learn it all and then have a huge exam at the end when you have forgotten what you learned in the first week.
- I thought it was done well and should stay like this.
- I thought the system worked very well as the work didn’t heap up over the semester. If it wasn’t as structured, I wouldn’t understand it as much.
- It doesn’t let you slack off. You finish one exam and start studying for the next.
- Keeps you from slacking in the first semester. Good background for the future.
- Makes you study as you go and not cram it all in a week.
- It was good because you studied as you go. You were forced to learn which didn’t allow you to slack off till the last minute.

Question 6 : Any general comments about the unit?

Student Comments for Question 6

- Well structured and easier to remember than a lot of other units.
- I thought the system worked very well as the work didn’t heap up over the semester. If it wasn’t as structured, I wouldn’t understand it as much.
- The actual subject is not the most exciting so the way it was taught was good because it made it easier to understand with the notes and real life examples that the lecturer gave.
- With the computer quiz it made studying a lot easier for the multiple choice.
- I found it interesting and challenging.
- Much easier to understand than economics was at school.
- I find I have learnt heaps and now I understand what my old man is winging about when he starts going on about the economy!!
- Good unit even though I knew nothing about economics.
- I thought this was the best unit of the semester and the easiest to learn.
- I enjoyed the unit. It has increased my understanding and interest.
- I thought it was well structured and appropriate for first year students.
- Learnt more from this than most other units.

Conclusions

Mature age students particularly appreciated this system of self-contained modules as it imposed the discipline they needed to maintain their study.

Students in general reported that they regarded the WebCT tests and feedback as a vital factor in their learning of the material in the unit.

For difficult, content oriented, basic units such as this compulsory economics unit, learning via a structured WebCT quiz with immediate feedback can enable students to succeed when previously they would have become lost, confused, disillusioned, depressed and subsequently failed the unit.

In general this unit structure allowed students to learn better, faster, more easily, less painfully, more confidently, more efficiently, and reach a higher level of success than otherwise would have been the case.

The students also had the opportunity, and the responsibility, to take control of their learning and had immediate, accurate, impartial, personal, and confidential feedback on their progress.

This unit, though highly structured, effectively put the responsibility for success or failure squarely on the shoulders of the student. It also gave students the opportunity to succeed "a bit at a time" which encouraged these first year students to have confidence in their ability to succeed in their other units.