

**What Matters In Large Class Teaching And Learning? A Case Study of an
Introductory Macroeconomics Course in South Africa.**

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Abstract

In many universities, economics lecturers now face the challenge of dealing with large, diverse classes, especially at undergraduate level. A common concern is the non-attendance at lectures of unmotivated (conscript) students. This paper presents the results of a student assessment of a macroeconomics 1 course, coupled with a self-assessment of their own input into the course. The results obtained, using econometric models, suggest that what students do outside of lectures is equally, or more, important than lecture attendance itself. The paper concludes by examining the possibility of using peer assessed group learning as a feasible way to encourage deep learning in large classes.

JEL classification: A22

(Economics education and teaching of economics: undergraduate)

Introduction

Although student evaluations of teaching (SETs) are mandatory in most universities, they are a more contentious teaching evaluation tool than many realize. For example, it has been noted by a number of authors that SETs are positively correlated with student characteristics, like grades or expected grades, student effort and even psychological factors. It is thus likely that SETs are capturing, not only the quality of the lectures delivered, but also the characteristics of the specific student.

For example, dedicated students, who attend lectures more regularly, do the required reading and so on, are likely to get more out of lectures than less dedicated students. SETs would then be dependent not only on the actual quality of the lectures, but also on student inputs into the course. The central question would then become how one motivates students to become more involved (lecture quality obviously being part of this), rather than placing the onus on lecturers to improve lecture quality only.

We argue that this new focus, or restatement of the problem, is important because it puts at least, some of the responsibility for learning back with the students. A danger of using SETs for staff evaluation is that some students somehow get the idea that their learning is the lecturer's responsibility and that failure is not their problem, but the result of poor teaching. While teaching quality (as evaluated by the students) is likely to be an important determinant of both lecture attendance and performance, we hypothesize that the causality runs, at least partly, from good students to good lecturer evaluations and not the other way around. Building on this, we hypothesize that student rating of lecture

quality is positively related to student input into the course (measured by hours of work outside class, textbook reading and so on), which in turn is often positively related to performance.

Student Evaluations of Teaching and the “Why Go To Lectures?” Survey

As mentioned above, there is some evidence that the grade or the expected grade of the student is positively related to teaching evaluation scores. For example, Isely and Singh (2005), using a fixed effects model, showed that if an instructor has two classes, one of which expects a higher grade, the latter class will tend to give better SETs. Stratton et al. (1994) found that introducing mandatory SETs at the University of Akron initially resulted in some grade inflation by instructors of a principles of economics course by about 11%. However, over the nine year period of the study, the effect diminished. This suggests that, at least initially, lecturers believed that higher grades would increase SETs. However, Gramlich and Greenlee (1993) found a positive, but weak, relationship between SETs and actual student grades and mention that a potentially important omitted variable could be student effort, for example, hiring a paid tutor. Authors like Seiver (1983), using a simultaneous equation model, and DeCanio (2001) do not find any significant relationship between grades and SETs.

Siegfried and Fels' (1979;931) rather extensive survey of teaching college economics, notes the controversial issue of instructors 'buying' higher evaluations by lowering the 'price', that is the effort that students have to put in to attain a certain grade. They argue that this expectation is borne out in empirical studies rather than theoretical ones.

Bosshardt and Watts (2001) compare SETs with instructor self-evaluations using the TUCE III data set. They find that, while there is fairly highly (positive) correlation between student evaluations and instructor self evaluations of overall teaching effectiveness, there is disagreement as to what aspects of teaching are most important. English first language speaking instructors regarded enthusiasm and their English language ability as most important in determining their effectiveness, while students valued (in order of importance) instructor preparation, English language ability, grading rigor and enthusiasm. They also find some evidence that, in classes with low response rates, student evaluations are lower, but that students in these classes expect higher grades, which could indicate that “weaker instructors are “buying” better evaluations with easier grading standards” (Bosshardt and Watts 2001:12). They conclude that administrative use of SETs in principles of economics classes assume either that student assessments are important, even when they differ from instructor self-evaluations, and/or that student evaluations are more important than instructor self-evaluations.

The mixed evidence, relying as it does on a multiplicity of different methods, samples, time periods and variables, is somewhat difficult to interpret overall, but does suggest that perhaps there are important explanatory variables being omitted. For example, what determines lecture attendance and is lecture attendance positively related to SET scores?

In 2001, the Rhodes University vice-chancellor commissioned a study on why students do, or do not attend lectures (Irwin et al. 2001). A quarter of the students who responded commented that lectures were not very useful because they added no value, were boring and that the lecturers had poor lecturing ability (related to communication and presentation skills; lecturer’s inability to help students understand the subject, lectured at a pace either too fast or too slow, were unenthusiastic and uninspiring and repeated work already covered). Recommendations were, not surprisingly, that staff needed to pay more

attention to lecturing quality and improve dramatically if they wanted to keep students in their lectures and their courses.

The question that was not asked was what the relationship was between student effort, student performance and the rating of lectures as “bad” might be. In other words, what other variables could be affecting student evaluations. A fascinating article by Grimes et al. (2004) suggests that SETs are positively related to the degree to which students take responsibility for their own learning, or their “locus of control”. Students with an external locus of control have a passive attitude towards their grade – it is randomly determined by forces beyond their control – will tend to place the responsibility (particularly for doing badly) onto others; in this context, the lecturer. Those with an internal locus of control will readily assume responsibility for their own lives and are thus less likely to blame others for their failures and are, in any case, likely to be better students.

In a study done at Mississippi University, Grimes et al. (2004) used the Rotter scale to determine each student’s locus of control and found that those with an internal locus of control were more likely to give teachers above average evaluations. In addition, other student specific traits, like their ability and hours of study outside class were also found to be positively correlated with SET scores. While Grimes et al. (2004:143) do not offer any suggestions on how to influence students’ locus of control, which they see as “an innate and personal characteristic with deep sources arising from genetics and lifetime experiences”, a logical suggestion stemming from their findings would be to encourage students to assume control of their own learning or to “motivate” them.

Related to the issue of motivation is the study by Benedict and Hoag (2004) of the relationship between seating preferences and grades of 198 economics students at Bowling Green State University. They find a strong relationship between better performance in the course (likelihood of scoring an A or B grade) and a preference for middle-front seating and poorer performance (likelihood of scoring a D or F grade) and preferences of back seating. While it can be argued that students who sit near the front can see and hear better and are motivated to engage more with the instructor, they also suggest that a preference for back seating might reflect the student's general lack of motivation and/or confidence. In this case, seating preference is related to individual student characteristics, rather than teaching methods.

Theoretical Framework

This paper adopts the production function approach to economics education as suggested by Siegfried and Fels (1979). This theoretical framework has been used internationally for evaluating teaching methods and techniques (Edwards, 2000; 457). In the theory, inputs are categorized into three sections: human capital, utilisation rates and technology. These inputs enter into the 'economics education factory', to produce outputs such as cognitive performance, student attitudes and values, student development and generic skills. The production process is illustrated in the Figure 1.

The first category of inputs is human capital, which includes prior knowledge (school economics), high school qualification (matriculation score), school subjects taken especially English, mathematics and science, and student characteristics such as age, year in college and gender. Human capital is usually represented by aptitude measures such as high school qualification. Thus in our case, matriculation score is expected to be

positively related with student performance. Subjects taken in high school especially mathematics and English are expected to positively influence a student's ability to understand economics. When it comes to gender, a number of studies have shown that economics tends to favour male students due to its abstract and quantitative nature, but studies done on this have produced mixed results.

For example, Anderson et al (1994) conducted a huge study (n=6718) on determinants of successful completion of an introductory economics course at the University of Toronto. They found that high school performance (and choice of subjects) was significant in determining success in ECO 100, but only from certain threshold levels. For instance, they found that performance in ECO was positively related to having taken economics as a high school subject, but only if 76% or more was achieved. As in many other studies, they found that men were more likely to succeed than women; men obtaining 2.5% to 3.5% higher marks than women, all else held constant. Although they explore a number of possible reasons for this gender bias, they do not find any conclusive reason for the bias.

Utilisation rates, which are the second category of inputs, represent the time spent by students on the course. This is represented by variables such as student effort into the course through lecture and tutorial attendance, textbook reading and completion of assignments such as essays and class exercises. These factors assist with understanding of the subject matter hence have a positive impact on student performance.

The last category of inputs is technology, which refers to the “efficiency with which effort is transformed into cognitive achievement” (Siegfried and Fels 1979; 926). Most of the research on economics education has gone into this category of inputs. Economic theory suggests that improvement in technology results in an outward shift of a production function. Teaching technology includes institutional structure of education such as lecture schedules and duration of lectures; innovative instructional techniques such as computer assisted instruction and video; and the quality and effectiveness of lecturers and the textbook, as well as student learning environment (Edwards, 2000;460).

Outputs produced after combining the various inputs include: cognitive performance, student attitudes towards the subject, the impact of understanding and attitudes on subsequent behaviour, changes in values and the distribution of benefits (Siegfried and Fels, 1979; 927). Even though literature in the field has pointed out the problems of measuring these outputs, cognitive performance is usually captured by students’ performance in examinations or tests.

The use of change in test scores, which is the difference between the pre- and post- test scores, is recommended since it captures the value added by the course, other than using absolute values which measures the stock of knowledge(Edwards, 2000; 461). Test of Understanding of College Economics (TUCE) has widely been used to calculate the pre- and post- test scores but their equivalent is not available in South Africa. Cognitive performance mainly depends on human capital inputs and these two are positively related.

Student attitudes can be categorized into three: attitude towards policy issues, attitudes towards economics and opinions regarding the quality of instruction (Siegfried and Fels, 1979; 930). The second and third categories are measured by teaching and course evaluations that is, SETs. Measuring student attitudes can be problematic, as it has been earlier noted that lecturers can influence student evaluations (SETs) by marking leniently. Studies have shown that students who take an interest in economics as a subject (i.e have a positive attitude) are likely to put in more effort and hence perform well, holding factors such as aptitude constant. Student attitudes towards a course can be determined by various factors, such as lecturer effectiveness.

The most important criticism of the production function approach is that education tries to achieve multiple objectives and these may not be reflected by test scores only (Becker (1997; 1363). Outcomes, such as an economics course contributing to student development, may not be measured by test scores. This indicates that the single equation approach may be inadequate. Also, due to the problem of measurement of both inputs and outputs, variables which are supposed to be exogenous end up being determined within the system. This brings up the issue of cause and effect, simultaneity bias as well as multicollinearity problem.

The Case Study: Economics 102

Macroeconomics 102 is a first year course offered in the second semester of each year. Although it is semesterised and counts as half a credit if taken alone, the majority of the

class takes Microeconomics 101 in the first semester. Economics 1 and 2 is a requirement for commerce degrees at Rhodes University, so many of the students are conscripts. However, a significant minority of the average class of around 500 students is drawn from the Humanities. The course runs over 13 teaching weeks, with four non-compulsory lectures (repeated twice each day) and one tutorial a week. Attendance at 85% of tutorials is compulsory.

The questionnaire was developed with useful inputs from economics department staff and the university Academic Development Centre. It was administered in the tutorials and asked students to evaluate various aspects of the course. Variables such as lecture quality, tutorial quality, the usefulness of the textbook, tests, tutorial exercises and essay topics in achieving the course outcomes, the quality of the feedback and the overall quality of the course in relation to other first year courses were included. Students were asked to rate these variables on a scale from zero to nine¹, where zero was defined as very bad or not at all useful, 4 or 5 was acceptable or reasonable and 9 was excellent or very helpful. An open-ended question for general comments was included.

In addition to this traditional section, part B of the questionnaire required that the students rate their own ability and inputs. Tutors were requested to emphasize that there would be no gain to students in inflating or deflating their true abilities and inputs, but

¹ We were constrained by a zero to nine scale because (in order to contain data recoding costs) students completed the evaluation on an electronic mark sheet – the largest of which had only ten possible categories.

that we were interested in the outcomes in a non-critical way². In this section, students were also asked to rate, on the zero to 9 scale, their English language ability (defined as speaking, understanding, reading and writing), their attendance at 102 lectures (where zero showed no attendance, 4 or 5 showed about 50% attendance and 9 showed 100% attendance), their textbook reading (where 4 or 5 showed that they had read about half the required material and 9 showed that they were completely up to date), and the number of hours spent on the course per week, excluding lecture and tutorial attendance. They were also asked to report their June exam performance in economics 101 and their performance in the first 102 test (the most recent at the time of the survey).

The evaluation was administered in the compulsory tutorials in the middle of the fourth term, rather than in lectures as is usually done, in order to avoid bias. It was also done well before the end of the term, rather than at a later date because student attendance and interest usually declines as the end of the year approaches. In all, 431 responses were received out of a total of 520 students – a response rate of about 83%. As many as possible of these responses were used in the non-parametric analysis. Once incomplete responses and those respondents who had marked more than one option for any particular question had been excluded, a sample size of 371 was obtained (71% response rate) for the econometric models below.

² Although the evaluations were anonymous and students were encouraged to give honest answers, it is possible that they reported more lecture attendance than they attended in reality. The same goes for other self-rated activities, like hours of study, textbook reading, English language ability and so on. Nevertheless, the results were treated as if they were truthful, but a possible upward bias is noted.

Four models were developed, based on the production function approach to teaching economics, to investigate the following questions: (i) How much of lecture attendance can be explained by lecture quality and student input and abilities? (ii) To what extent do student inputs and abilities influence the ratings they give to lecturers? (iii) How important is lecture quality and attendance in determining student performance? And (iv) what influences the overall rating given to the course by students?

The Models and Results

(i) Lecture attendance

Lecture attendance was hypothesized to be a function of lecture quality, student's aptitude as measured by the 101 exam, English language ability as rated by the students themselves (on a 0 to 9 scale), textbook reading (where the percentage of required reading done was rated on the 0 to 9 scale, with 0 being no reading, 4/5 having covered about half the work and 9 being completely up to date). Sixty one percent of students reported their lecture attendance between 7 and 9 out of 9, the mean value being 6.5 (about 72% of all lectures attended and the median, 7(See figure 2).

The model (see table 1) explains 24 percent of the variations in lecture attendance (adjusted $R^2 = 0.23$). The data fits the model well according to the F statistic, with a probability of zero percent. The null hypothesis of no heteroscedasticity was accepted at the 5 percentage level. We also fail to reject the null of no autocorrelation in the model at one percent level. The coefficients of all the explanatory variables are statistically

significant at the one percent level and have positive signs as expected, except for the language variable, which has a negative sign.

Lecture quality is the most significant, showing that lecturer effectiveness has a great influence on lecture attendance. For a one unit increase in lecture quality rating, lecture attendance increases by about half a unit. Since the course consists of a total of 52 lectures, one unit represents about 5.8 lectures. So for each unit (on the zero to 9 scale) increase in the quality rating of the lectures, the number of lectures attended by the student increase by roughly 3.5 or about 7% of the total lectures given in the course.

The coefficient for the 101 exam, which captures both student's academic ability as well as prior knowledge, shows that lecture attendance and student's aptitude go hand in hand; hence it is academically good students who attend lectures. The coefficient for textbook reading, a proxy for how much effort the student puts in, indicates that textbook reading complements lecture attendance, again indicating that it is partly the amount of work done outside class time that determines how much students participate by attending lectures. For a unit increase in microeconomics exam and textbook reading, lecture attendance increases by about 0.2 units each, or by just one lecture for the whole course.

Contrary to *a priori* expectations, the sign of the coefficient of the language ability variable is negative and statistically significant. In other words, students who rated themselves less well in English language ability, attended more lectures. In a certain sense this is logical, since those students who are less confident in language ability, may

feel that the lectures provide them with extra help. This indicates that generally, 102 lectures are seen as useful to second language speakers. Interestingly, this is also a finding by Anderson et al (1994) who conducted a huge study (n=6718) on determinants of successful completion of an introductory economics course at the University of Toronto. They report a statistically significant and robust negative relationship between performance in ECO 100 and high school English results, but do not offer any suggestions as to the cause of this relationship.

The negative language coefficient is an important outcome of the research since 44% of respondents rated their English language ability as less than 8. Thus, for a 1 unit decrease in language ability rating, lecture attendance increase by 0.13 of a unit, or just less than one lecture for the whole course (see figure 3).

Briefly put, the model showed that lecture quality is an important determinant of lecture attendance. Student effort is also important (measured here by textbook reading) and that less good English language ability is associated with more lecture attendance. The results refute the commonly held belief that poorer English language speakers get less out of lectures than first language speakers.

What else could be impacting on lecture attendance? There are many variables that could be included, for example, the social habits and sporting commitments of the students, the rapport with the lecturer, the faculty of the student (conscripts from commerce versus the

volunteers from humanities), gender, age, race and so on. Further research in this area is greatly needed.

(ii) Lecture quality

The next model looked at the determinants of lecture quality as perceived by the students. Seventy-five percent of students rated lecture quality between 7 and 9 on the zero to nine scale, the mean rating being 7 (see figure 4). It is important to emphasize that this study did not attempt to determine what the students' thought a "good lecture" was, but merely asked them to rate lectures according to how useful they were in helping students to fulfill the course outcomes. However, the 2001 survey (Irwin et al. 2001:8) showed that students ranked the five most important objectives of a lecture as being: to explain difficult concepts, provoke critical thinking, give an overall structure, prepare you for tests and examinations, and relate theory to everyday life. This response seems to us to be quite closely related to what lecturers might rank as important, but differences reported by, for example Bosshardt and Watts (2001), should be borne in mind.

The model included English language ability, lecture attendance, 102 test 1 results (as a proxy for performance in the course), textbook reading and hours spent on the course. Contrary to the usual evaluations, this model wanted to determine to what extent student characteristics determine their perception of lecture quality. The model was statistically significant at the 1% level and explained about 20% of the variation in lecture quality

rating. All the variables have the expected signs and are statistically significant, apart from language ability, which is positive, but insignificant (see table 2 for results).

As expected, lecture attendance is highly significant (at the 1% level) and positively related to students' rating of lecture quality. Specifically a 1 unit increase in lecture attendance (about 6 lectures), resulted in a 0.21 unit increase in lecture quality rating. The relationship between lecture attendance and quality is hypothesized to be a two-way one creating a kind of feedback loop: the more lectures you go to, the more the lectures make sense and the more highly you rate them, but also, the more highly you rate the lectures, the more useful you find them and the more lectures you go to.

As found in other studies (Isely and Singh 2005; Strattan et al 1994; Van Waalbek 2004; Gramlich and Greenlee 1993) performance in the course, measured by 102 test 1 performance, was also highly significant and positively related to lecture quality rating, but not by a large amount. A 1 unit increase in test performance (about 10%) leads to a 0.11 unit increase in lecture quality rating.

Textbook reading was positive and significant at the 10% level, but very small (a 1 unit increase in textbook reading lead to a 0.08 unit increase in lecture quality rating). Similarly, a one-hour increase in hours spent on the course, led to a 0.06 unit increase in lecture quality rating. In other words, student characteristics are again a relatively significant determinant of student perceptions of lecture quality.

The model thus indicates that about 20% of lecture quality rating depends on the student's attributes over which the lecturer has no direct control. It would be interesting to see to what extent the inclusion of lecturer attributes, like punctuality, preparedness, humour, explanatory ability and so on, would improve the model. Other student variables, such as gender, age and faculty could also be included.

(iii) Student performance

The next model used the 102 test result as a proxy for student performance in the course. Although not foolproof, as some students manage to improve their exam performance by much last minute cramming, for most students, test marks are a fairly good indication of how they are performing in the course. Explanatory variables included the 101 exam results, language ability, lecture attendance, textbook reading, lecture quality and tutorial rating. Overall the model is significant at the 1% level and explains 39% of variation in student performance. The signs of coefficients are as expected except for language ability, as shown in table 3.

The most significant determinant of 102 performance is the 101 exam. This is not surprising, since 101 introduces the methodology of economics, some of the terminology and lays the foundations for the economic way of thinking. Specifically, a one unit increase in the exam results (10%) leads to almost half a unit (5%) increase in 102 test performance. The variable is highly statistically significant. This result raises interesting questions as to whether the full semesterisation adopted by Rhodes University (and many

others) is really to the student's advantage, since students who fail 101 are now entitled to continue with 102. Recent research by Guest and Vecchio (2003) also finds that there are positive learning spillovers between micro- and macroeconomics courses.

Lecture quality, as perceived by the students, was significant at the 1% level, although the impact on performance is marginal. Specifically, for a 1 unit increase in lecture quality rating, test performance would increase by about 0.15 of a unit or about 1.5%. Given some of the student-determined explanatory variables of lecture quality rating, this is not surprising. English language ability was once again negatively related to performance but was not at all statistically significant in explaining performance in the course.

Lecture attendance and textbook reading, which indicate student effort, were significant at the 5 % and 10% levels respectively. A one unit increase in lecture attendance (about 6 lectures) results in 0.08 units or about one percent increase in test performance and a one unit increase in textbook reading leading to a 0.06 unit or about half a percentage increase in test performance. As in the Van Walbeek (2004) study, results indicate that lecture attendance has only a very marginal effect on performance in the course, perhaps indicating that academics, who after all give the lectures, are more worried than they should be when their audience becomes somewhat thin.

Tutorial rating was included to indicate their usefulness in enhancing economic understanding (as measured by student performance). Even though the coefficient had the

right sign, it was not significant at the standard levels of significance. Tutorials play an important role in facilitating understanding. Siegfried and Fels (1979) observed that deep learning takes place in small group learning environment. Perhaps test performance does not capture this aspect of the course; otherwise there is a problem of measurement of tutorial contribution.

This model performed better than any of the others – the variables included explained 38% of what determines 102 performance. Important omitted variables are lecturer's attributes, gender, previous performance in related subjects (like mathematics), and high school performance among others.

(iv) Overall course rating- used a measure of student attitude towards the course

Figure 5 shows that, students rated the 102 course highly (compared to other first year courses) with a mean and median of 7 on the scale of zero to 9. Approximately two thirds of the students rated the course between 7 and 9, and more than three quarters of students rated the course above average.

In our final model we investigated the determinants of overall course rating, which is an indication of student's attitude towards the course. Variables included were lecture quality, tutorial quality, textbook usefulness, feedback quality, hours spent on the course, language ability and test performance. The model explained about 27% of the variation in

the overall course rating and was statistically significant. Apart from language ability, all the signs are positive and as expected as shown by Table 4.

The most significant variables (at the 1% level) were test performance and lecture quality, textbook rating and quality of feedback. Specifically for a 1 unit increase in test performance (10%), overall course rating increased by 0.2 units. A one unit increase in lecture quality rating, increased overall rating by 0.25 units. A one unit increase in textbook reading and feedback rating increased overall rating by 0.22 units each. Again, the emphasis is on a combination of lecture quality and student attributes as determinants of overall quality rating of the course, rather than purely on lecture quality.

The remaining variables, tutorial rating, hours of work and language ability, were not significant, with language having an unexpectedly negative sign. What the language variable is indicating is that overall course rating increases for those students who rated themselves less well in English language ability. This verifies earlier results that indicated that the department is doing well in accommodating and assisting those students with language difficulties. As expected, overall course rating increases slightly as tutorial ratings and hours of work spent on the course increase.

An area of concern is related to the significance of feedback in explaining overall course quality ratings. Feedback was the one area that received both a mean and median rating of 6 out of 9, rather than 7. As indicated, 102 students hand in about 13 pieces of written work each during the semester course – a total marking and grading load of about 6300

pieces of work for the course, excluding exams. The tutors are mostly responsible for this work and, while as much time and effort as possible is put into moderating their work, the course lecturers are always aware that some problems arise.

Conclusions and Recommendations

What the above discussion indicates is that, while student evaluations of lecture quality is an important determinant of student performance and has a significant effect on their overall rating of the course, it is also capturing some of the characteristics of the students themselves. What seems to be an equally important factor is the motivation of the students, as evidenced by their input into the course.

The recent focus of higher education research and authorities on assessment methods as being very important in motivating and empowering students may be of considerably help here. For example, peer assessment has been shown to be very useful: it simulates a real-world environment where feedback from peers is important; develops critical evaluation skills; exposes students to a variety of different answers; encourages better quality work; and increases student confidence (Rust 2001; Salemi et al. 2001; Crocket and Vasanthi 2003; Mento and Larson 2004, Race, 2001). While not the focus of this paper, it would be interesting to compare the performance and teaching evaluations of courses taught with and without the use of peer assessment for some tasks. Further research is needed in this area.

We have argued that lecture quality (as evaluated by students) is only one factor influencing course performance and that the evaluations themselves are coloured by student specific characteristics. In line with learner-centered rather than teacher-centered teaching philosophies, we suggest that it is at least equally important that students are motivated to take responsibility for their own learning as it is to get staff to improve lecture quality.

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Figure 1

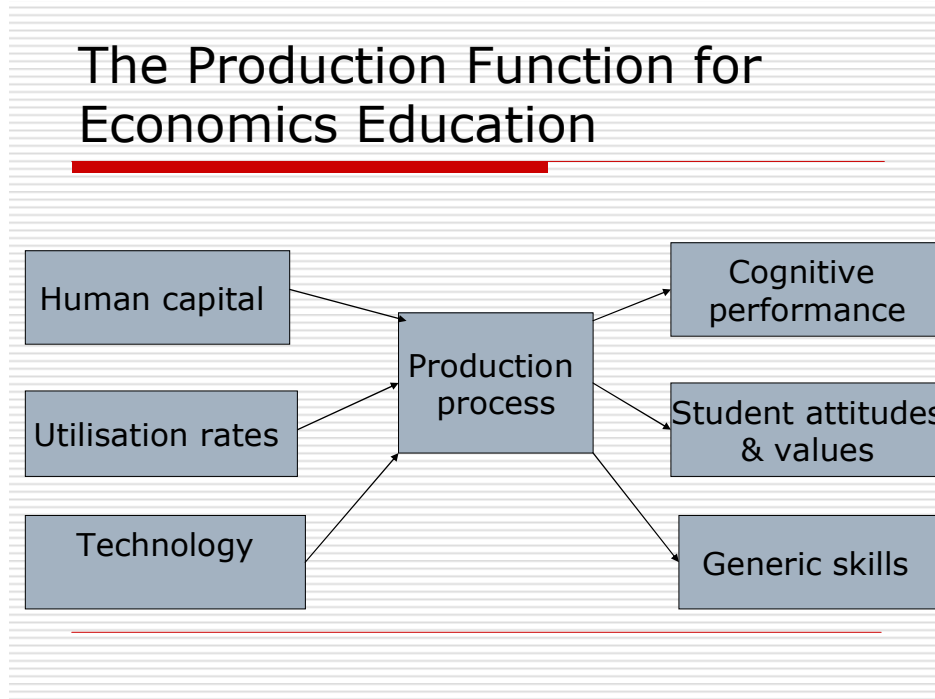


Figure 2: Lecture attendance

Lecture attendance rate on the 0 – 9 scale where 0 = no attendance, 4 or 5 = about 50% of lectures attended and 9 = 100% of lectures attended.

N = 430

Mean: 6.5 (about 72%)

Median: 7

61% of students rated their attendance between 7 and 9

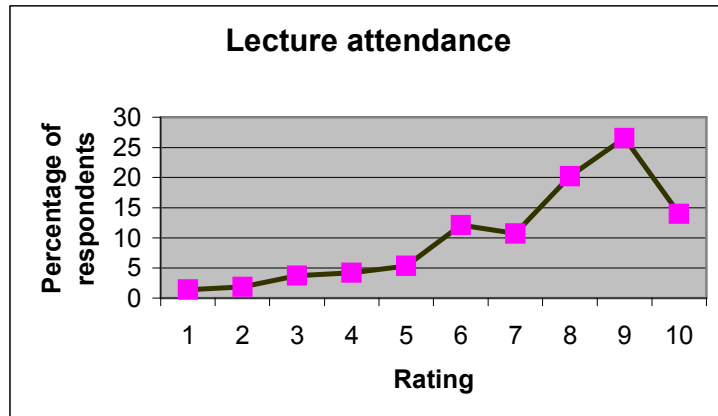


Figure 3: English language ability
 Language ability (defined as including speaking, understanding, reading and writing) rated on the 0 to 9 scale where 4 or 5 = basic ability and 9 = excellent ability.
 N = 429
 Mean: 7.75
 Median: 8
 Self-rating 8 or 9 = 66%
 Self-rating 7 – 9 = 83%

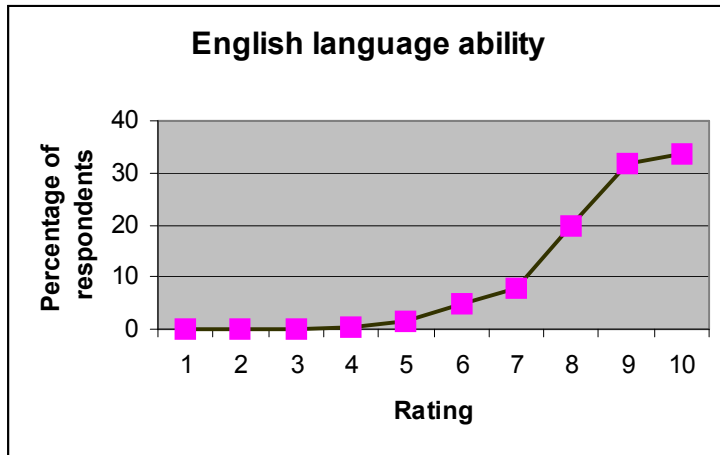


Figure 4: lecture quality
 Overall lecture quality rated on the 0 to 9 scale. Students were reminded of course objectives and asked to rate lecture quality according to their usefulness in helping to achieve these outcomes
 N = 430
 Mean: 7.15
 Median: 7
 75% of respondents rated lecture quality between 7 and 9.

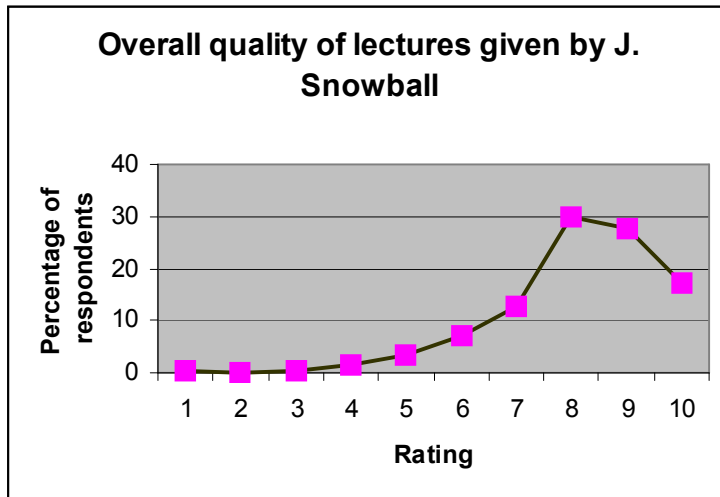
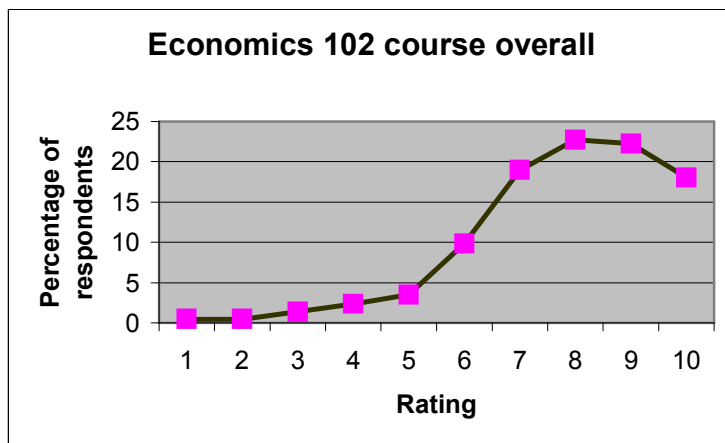


Figure 5: Overall course rating of Economics 102
 Rating on the 0 to 9 scale in terms of usefulness, interest and enjoyment compared to other first year courses.
 N = 427
 Median: 7
 Mean: 6.9
 63% rated the course between 7 and 9 and 82% between 6 and 9 (above average).



Tables

Table 1: Determinants of lecture attendance

Variable		Coefficient	t-Statistic
Constant		1.8825	2.1526** ³
Lecture quality		0.6069	8.2236***
101 exam		0.1786	2.6809***
Textbook reading		0.1712	2.8705***
Language ability		-0.2245	-2.8492***
R-squared	0.238	Adjusted R-squared:	0.229
Durbin-Watson stat	1.915	Probability (F-statistic)	0.0000

Table 2: Determinants of lecture quality as rated by students

Variable		Coefficient	t-Statistic
Constant		4.1242	8.3181***
Language ability		0.0323	0.6852
Test 1 results		0.1189	2.8550**
Textbook reading		0.0805	1.7117*
Lecture attendance		0.2135	5.3352***
Hours spent on course		0.0605	1.6639*
R-squared	0.1989	Adjusted R-squared:	0.1880
Durbin-Watson stat	1.9478	F-statistic	0.0000

³ * = significant at the 10% level
 ** = significant at the 5% level
 *** = significant at the 1% level

Table 3: Determinants of student performance, given by the 1st macro test

Variable		Coefficient	t-Statistic
Constant		0.8512	1.4732
Lecture attendance		0.0759	2.3094**
Lecture quality		0.1541	3.0424***
Textbook reading		0.0648	1.7373*
Tutorial rating		0.0567	1.2215
Language ability		-0.03934	-0.8034
Micro exam results		0.5135	12.4404***
R-squared	0.387	Adjusted R-squared:	0.377
Durbin-Watson stat	1.906	Probability (F-statistic)	0.000

Table 4: Determinants of overall course rating

Variable		Coefficient	t-Statistic
Constant		0.9321	1.1678
Lecture quality		0.2552	3.8708***
Tutorial quality		0.0623	0.8917
Textbook rating		0.2204	3.7123***
Feedback quality		0.2278	3.2476***
Hours spent on course		0.0478	1.1281
Language ability		-0.0784	-1.2131
Test 1 mark		0.2046	4.0665***
R-squared	0.2707	Adjusted R-squared:	0.2565
Durbin-Watson stat	1.9183	F-statistic	0.0000