Students' perceptions of economics: Identifying demand for further study

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Abstract

Most university departments aspire to increase their quantity of students. The objective of this empirical study is to ascertain whether it is possible to identify students who would demand more economics study. Using data on student perceptions of economics and the application of logistic regression, K-means clustering, ANOVA and Tukey's HSD statistical techniques we reveal distinct clusters of students, including a small cluster of students who appear to be more open to further study.

1.   Introduction

There is pressure on academic economics departments to increase their student numbers because they are seen as an important source of university revenue and an indication of an academic department's status. Yet in spite of supply, there seems to be a lack of demand for further study of economics.

There is some evidence of a student recruitment crisis in economics in the 1980s that manifested itself in falling student numbers wishing to pursue economics both at A-level[1] (pre-university qualification in the UK) and degree level (Millmow, 1996; Becker, 1997; Salemi and Siegfried, 1999; Alauddin and Valadkhani, 2003; Knoedler and Underwood, 2003). Some evidence from the United States suggests that this trend has been reversed (Siegfried, 2000) and that the fall in student numbers has levelled off (Siegfried, 2008) but the demand for further study into economics remains low.

The recent surge in research on the teaching of economics can be explained partly as a response to this recruitment crisis. Several theses have been advanced as to why recruitment has been low. Various contributions have focused on the content of economics (Ormerod, 2003), perhaps that it is over-mathematised (Eschenbach, 1999; Hartman, 1999). One response to these problems is to focus research resources on the more effective teaching of mathematics in economics (Raymond *et al*. 2008) so that students do not perceive the subject as being too difficult. Other literature assumes that students found the subject unattractive and/or difficult because of flawed teaching methods and that any problem could be corrected by better teaching (Becker, 1997) and/or technological innovations. Accordingly there are many initiatives that focus on the rationalisation of curricula (Helburn, 1997), recommendations to bring in more practical examples and applications of theory (Helburn, 1997; Fettig, 1999), recognition that not all students who study economics specialise in that

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[1]   Bachan and Barrow (2006) suggest that brighter males will select economics over business studies at A level.

subject (Earl, 2000), variations in delivery modes (Holt, 1999; Hazlett, 2008; Reiley *et al*., 2008 ; Goeree and Hinloopen, 2008), ICT (Reimann, 2004) and electronic discussions outside the classroom as a teaching tool (de Loach and Greenlaw, 2007).[2] Yet few of these studies prove that such initiatives result in greater student retention, an improvement in results, higher levels of student understanding (see, for example, Becker, 1997; Salemi and Siegfried, 1999) or greater student recruitment. In addition, we would argue that much of this literature has two common flaws: 1) it fails to ask what it is about economics that might make it popular (or otherwise)[3]; and 2) it tends to assume all students are essentially the same.

This paper attempts to ascertain whether it is possible to identify which students may demand more economics study. Using data on student perceptions of economics collected via an online survey and the application of logistic regression, *K*-means clustering, ANOVA and Tukey's HSD statistical methods, results are obtained which suggest that there is a small cluster of students who appear to be more open to further study and that there is a large majority who shy away from accumulating further economics education. The next section reviews the data set and Section 3 describes the results. Section 4 presents conclusions.

2.   Data

The empirical analysis in this paper is derived from a questionnaire conducted online which permitted the collection of both socio-economic correlates and responses to questions that sought the degree of agreement (using a 5 point Likert scale) with statements about perceptions of economics from university economics students at all levels of study. Table 1 provides some descriptive statistics of the socio-economic variables.

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[2]   See the Economics Network website for lots of examples of techniques that various people have tried http://www.economicsnetwork.ac.uk/showcase/

[3]   One exception is Klamer and Colander (1987) but students were not asked to indicate whether they did want to do more economics, or whether they would do the experience again!

{Insert Table 1 about here}

There is a slight majority of respondents that are male and 88.3 per cent are below the age of 27. All of the countries included in the sample contribute significant proportions of students to the sample both in terms of country of origin and country of study. The majority are undergraduates but these are distributed fairly evenly across the different years of study. Many students in the sample have work experience and/or a part-time job as well as having a background in economics study. A majority of them say their career goal is to work in the private sector; only 17.6 per cent want to become self-employed.

From Table 2 it can be seen that 16.5 per cent (60.9 per cent) of the students expressed an (dis)agreement that they want to study more economics. Over half (54.9 per cent) find the discipline confusing and 49.5 per cent find it frustrating. Further disparaging aggregate responses were provided with only 3.9 per cent expressing a belief that their study is helpful for their future career, 5.2 per cent indicating that it helps them make better decisions, and 16.9 per cent signifying that it helps them understand others' behaviour.

{Insert Table 2 about here}

Having gathered information on students' perceptions of economics as described above we proceed to analyse this data in two ways. First, we treat the sample as homogenous and analyse the determinants of demand for more economics via ordered logistic regression analysis; second, we use K-means clustering in an attempt to understand the data relationships between students' perceptions of economics. This statistical method assigns data values to a fixed (k) number of clusters with the goal of minimizing a measure of dispersion within the clusters and maximizing the difference between the means of the

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different clusters. The analysis is then extended using ANOVA and Tukey's HSD tests to identify the presence of statistically significant differences between clusters for each perception.

3.   Results

Regression analysis

Table 3 presents an ordered logistic regression analysis with the Likert scale responses for 'Want more Economics' as the dependent variable. The results suggest that students younger than 22 are most likely to want to study more economics, with those aged between 27 and 31 being 2.59 times more likely not to want more economics relative to those younger than 22 years of age. Students attending US (NZ) universities are 2.82 (5.71) times less likely to want to study more economics relative to students attending UK universities. Students who have undertaken work experience are 1.424 times more likely to want to study more economics than those who have not had work experience. Students who believe that economics has helped their future careers (help them make better decisions) are 2.20 (1.02) times more likely to want to study more economics relative to those who believe the opposite, while those students who suggest that economics has helped their understanding of others are 1.80 times more likely to study more economics relative to those who do not suggest this is the case. However those students who find economics frustrating (confusing) are 1.39 (1.41) times more likely to want to study more economics than the reverse. Of particular interest is that it is the youngest students at the earliest stage of their undergraduate degrees who want more economics education. Something seems to happen at the end of the first year or within the second year which turns them off wanting to study more economics.

{Insert Table 3 about here}

Cluster analysis

Regression analysis is useful in providing an overall picture of determinants of demand for further study of economics. However, it assumes that all students are essentially the same, when in fact pedagogical literature suggests this is not the case: students are different in various ways, such as their learning styles. We apply *K*-means cluster analysis in an attempt to capture this heterogeneity.

Table 4 presents the results of ANOVA tests concerning the population means for each perception of economics. It shows that there are meaningful differences among students regarding their perceptions of economics; since the test statistic is much larger than the critical value, we reject the null hypothesis of equal population means and conclude that there is a highly statistically significant difference among the population means for each perception. Given these ANOVA results it is worth proceeding to identify where these differences lie and how they contribute to the formation of different clusters.

{Insert Table 4 about here}

The appropriate number of data clusters is considered something to be identified in this analysis. It is expected that if natural clusters do exist for the data, then the number of clusters is likely to be quite small. *K*-means clustering was implemented for $k = 2$ to 15. The standard errors for each cluster size were calculated and a distinct kink in a plot of the standard error versus cluster size was identified to determine the appropriate number of clusters. The results indicate that there are 4 student clusters.

Key perception: I would like to study more economics if possible

For the purpose of illustration consider the graph in Figure 1, where the number of the cluster is presented on the horizontal axis and the corresponding cluster aggregate value for the perception are calibrated on the vertical axis. A higher perception number represents greater aggregate cluster agreement with the perception; so, for example, if respondents indicated that they strongly agree (strongly disagree) with the statement that they "would like to study more economics if possible" then they would be given a value equal to 5 (1). The average student in cluster 2 does not want to study more economics as indicated by an average value of 1.57. Cluster 3 has the highest value here, 3.84, and indicates a cluster of students who are most likely to want to study more economics. The average values for clusters 4 and 1 are around 2.5, as indicated in Table 5, which presents the results of the application of Tukey's HSD test. It can be seen that we have a 95 per cent level of confidence that these cluster means are statistically different.

{Insert Figure 1 about here}

{Insert Table 5 about here}

An alternative way of examining this information is to present it on histograms, as in Figure 2, to visualise the degree of skewness in the responses for students within each cluster. Panel A indicates that the students in cluster 1 are most likely to respond with either disagreeing or neither agreeing nor disagreeing that they would like to study more economics. These may be relatively ambiguous students who may follow more economics study if their peers were also doing so. Panel B presents the results for cluster 2, and it indicates strong desires not to study

any more economics. Panel C presents the results for cluster 3 where the most frequent response is that they either agree or strongly agree with the statement that they would study more economics. Finally panel D presents the results for cluster 4 who are fairly ambivalent but are more likely to disagree with this statement.[4]

{Insert Figure 2 about here}

Figure 3 presents the box plots of the responses to this perception question. It illustrates that although the responses are clustered there are positive and negative outliers with extreme values reported by students within clusters. This illustrates that although we can have a high level of confidence that a student within each of the clusters does or does not want more economics study there is the possibility that we may be wrong. Such outliers can be a concern but as they correspond to less than 1 per cent of the sample we proceed with the analysis.

{Insert Figure 3 about here}

Results from other perceptions

Figure 4 presents comparable results for other perceptions of economics. The first panel corresponds to the perception that studying economics is relatively easy. The average responses for clusters 1 and 2 are distinctly different from clusters 3 and 4. The opposite relationship appears for two other perceptions: i) whether they found it to be confusing, and ii) whether they find studying economics to be frustrating. In each of these cases the average

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[4]   Group dynamics and peer pressure may become relevant to understanding this process.

responses for students in clusters 1 and 2 were similar, as were the responses given by students in clusters 3 and 4. So for the student not being confused or frustrated is in line with their perception that the subject is not difficult.

{Insert Figure 4 about here}

Tukey's HSD post-hoc tests for the other perceptions are shown in Table 6a-g. There are statistically significant differences regarding the perception of easiness/difficulty of economics between groups 1 and 2 with groups 3 and 4, with students in groups 3 and 4 finding economics relatively easy. There were statistically significant differences between the average perceptions of the 4 student clusters. Students forming cluster 2 found economics to be difficult, too theoretical, not helpful in contributing to their future career or making better decisions or understanding behaviour, and they did find it confusing and frustrating. Students forming cluster 1 found it relatively difficult, quite theoretical but relative to cluster 1 they found it to be more helpful in shaping their future career and helping make better decisions, although they still found it frustrating and confusing as well as being quite unhelpful in helping them understand behaviour. Students in cluster 3 find economics relatively easy, untheoretical, and helpful in making better decisions and in shaping their future career as well as understanding behaviour. These students do not find it frustrating or confusing. Students in cluster 4 also find it relatively easy, neither frustrating nor confusing but they still find it theoretical, not much help for their future career or in making better decisions or understanding behaviour.

{Insert Tables 6a-g about here}

The clustering algorithm suggested the presence of 4 student groups which can be separated using two dimensions i) whether the student reports they find economics easy, and ii) all other contextual questions. These results are tabulated and summarised in Table 7. The descriptions represent largely a glum and disheartened set of students who may not be selling their experiences of economics study to their peers, friends or relatives. This point is relevant to all departments attempting to recruit students because of the effect of word of mouth on demand for the subject.

Recommendations

Thus far our results suggest that although there are general factors which might affect students' perceptions of economics and their desire for further study of it, the grouped sample must be understood as being more heterogeneous, comprising of clusters of students with distinct and specific combinations of perceptions of the subject, which in turn affect their desire for more of it.

With barely 14 per cent of the sample being members of cluster 3, it is important to recognise how students could be moved between clusters and whether policy could be formed to encourage greater take up of further economics study. For instance, students in cluster 4 should be informed about how greater economics study can help them in their future career (and the content of economics might need to change so that clear and obvious examples are provided). It may be more difficult to encourage students to move away from clusters 1 and 2, which represents 55 per cent of the sample, as these students find the subject hard, frustrating and confusing.

{Insert Table 7 about here}

Of interest is whether students in certain clusters are likely to be educated in specific countries. Figure 5 illustrates that students who form cluster 3, i.e. those students who are most likely to want to study more economics, are more likely to be educated in the UK and least likely to come from the US or New Zealand. The figure also illustrates that UK students are more likely to find it easy, US and Australian students are most likely to find it of not much use and New Zealand student are most likely to find it hard. Further research could identify why these country differences occur and whether this represents variations in the content or the process of economics teaching.

{Insert Figure 5 about here}

Tables 8a and b present a re-examining with the sample split by gender. Male students who form cluster 3 are more likely to be from the UK or Australia, and this effect is even stronger for females. Although we already know students from the US are dominant in cluster 2, it appears these are also more likely to be male. Table 9 shows there is no clear age pattern in these results, except that the youngest students are least likely to be in cluster 3, and that it is very difficult to predict a student's cluster membership based on specific socio-economic variables.

{Insert Tables 8 about here}
{Insert Table 9 about here}

The descriptive statistics and the regression results presented above suggest that there is a minority of students who are willing to undertake further study into economics. These

students find economics relatively easy, untheoretical, and neither frustrating nor confusing; they perceived economics will be of help in their future career, helps them make better decisions and helps them understand others behaviour. They are relatively young, of either gender, are more likely to be students from either the UK or from Australia and will be in their first year of university study. If university economics departments are to increase their intake they should target these groups of students at an early stage and reiterate the benefits of the accumulation of economics education throughout their studies.

4. Conclusion

There is pressure on academic economics departments to increase their student numbers. This paper has sought to identify whether there is a clear cluster of students who would want to study more economics. Using a data set of student perceptions of economics from respondents across the globe, the above statistical analysis indicates four statistically different clusters of students, although only one cluster of students appears to be open to more economics study. The results of this study indicate that demand for economics is connected to combinations of perceptions of the subject.

Such results are informative and useful because they illustrate that large groups of students feel alienated from the subject. The results suggest that there are at least two strategies open to those wishing to remedy this situation. One: the content and character of the subject remain intact, whilst instructors try to convince current students that the subject is useful, helpful to their future career and will help them with their decision making; or two: the content is changed so that student wanting these characteristics can more easily identify that this is the case. Further research is necessary in order to explore that question.

References

Alauddin, M. and Valadkhani, A. (2003) Causes and Implications of the Decline of the Economics Majors: A focus on Australia, *Journal of Economic and Social Policy*, 7: 68-90.

Bachan, R. and Barrow, M. (2006) 'Modelling Curriculum Choice at A level: Why is Business Studies more Popular than Economics?' *International Review of Economics Education*, 5 (2): 58-80.

Becker, W. (1997). 'Teaching Economics to Undergraduates', *Journal of Economic Literature*, 35: 1347-1373.

de Loach, S. and Greenlaw, S. (2007). 'Effectively Modelling Electronic Discussions', *Journal of Economic Education,* 37 (4): 419-434.

Earl, P. (2000). 'Indeterminacy in the Economics Classroom', in P. Earl and S. Frowen (eds) *Economics as an Art of Thought: Essays in Memory of GLS Shackle*, London: Routledge.

Eschenbach, E. (1999). 'Response to Hartman's Suggestions for Teaching Engineering Economy at the Undergraduate Level', *The Engineering Economist,* 44 (1): 110-125.

Fettig, D. (1999). 'Seeking a Blueprint for Economic Literacy', *The Region*, 13 (2): 3-7.

Goeree, M. and Hinloopen, J. (2008). 'Co-operation in the Classroom: Experimenting with R&D Co-operatives', *Journal of Economic Education,* 39 (4): 357-373.

Hartman, J. (1999). 'Suggestions for Teaching Engineering Economy at the Undergraduate Level', *Engineering Economist,* 44 (1): 110-125.

Hazlett, K. (2008). 'A Classroom Inflation Uncertainty Experiment', *International Review of Economics Education*, 7 (1): 47-61.

Helburn, S. (1997). 'ECON 12 and the New Social Studies: Love's Labour's Lost?'*, The Social Studies*, 88 (6): 268-276.

Holt, C. (1999). 'Teaching Economics with Classroom Experiments: A Symposium', *Southern Economic Journal*, 65 (3): 603-610.

Klamer, A. and Colander, D. (1987). 'The Making of an Economist', *Journal of Economic Perspectives*, 2: 95-111.

Knoedler, J. & Underwood, D. (2003) Teaching the principles of economics: a proposal for a multiparadigmatic approach, *Journal of Economic Issues*, 37: 697-725.

Millmow, A. (1996). 'An Immiserising Trade in Economists', *People and Place*, 4(4).

Ormerod, P. (2003). 'Turning the Tide: Bringing Economics Teaching into the Twenty-First Century', *International Review of Economics Education*, 1 (1): 71-9.

Raymond, F., Raymond, A. and McCrickard, M. (2008). *International Review of Economics Education*, 7 (1): 62-102.

Reiley, D., Urbancic, M. and Walker, M. (2008). 'Stripped Down Poker: A Classroom Game with Signalling and Bluffing', *Journal of Economic Education,* 39 (4): 323-341.

Reimann, N. (2004). 'First Year Learning Environments in Economics', *International Review of Economics Education*, 3 (1): 9-38.

Salemi, M. and Siegfried, J. (1999). 'The State of Economic Education', *American Economic Review*, Papers and Proceedings, 89 (2): 355-361.

Siegfried, J.J. (2000). 'Undergraduate Economics Degree Trends Through the 1990s', *Journal of Economic Education*, 31 (3): 296-300.

Siegfried, J. (2008). 'Trends in Undergraduate Economics Degrees 1991-2007', *Journal of Economic Education,* 39 (3): 297-301.

Table 1: Variable Descriptions

Variable	Group	Count	%
Gender	Male	611	55.1
	Female	497	44.9
Age	Under 21	692	62.5
	22-26	286	25.8
	27-31	53	4.8
	32-36	32	2.9
	37-41	25	2.3
	42+	20	1.8
Student's country of origin	USA	186	16.8
	UK	329	29.7
	Australia	159	14.4
	New Zealand	132	11.9
	Other	302	27.3
University year	Year 1	389	35.5
	Year 2	247	22.5
	Year 3	278	25.3
	Year 4	141	12.9
	Other	42	3.8
Qualification level	Undergraduate	927	83.8
	Postgraduate diploma	36	3.3
	Masters	90	8.1
	MBA	28	2.5
	Other	25	2.3
Country of study	USA	208	18.8
	UK	457	41.2
	Australia	203	18.3
	New Zealand	203	18.3
	Other	37	3.3
Employment	Work Experience	680	61.4
	Part-time job	884	79.8
	Economic background	758	68.4
	Private sector job	553	55.2
	Public sector job	241	24.1
	Self-employment	176	17.6
	Other employment	32	3.2

Table 2: Counts and percentages

Group	1	2	3	4	5
Want more economics	314 (28.3)	361 (32.6)	250 (22.6)	144 (13.0)	39 (3.5)
Confusing	54 (4.9)	179 (16.2)	267 (24.1)	454 (41.0)	154 (13.9)
Frustrating	80 (7.2)	225 (20.3)	254 (22.9)	401 (36.2)	147 (13.3)
Understanding behaviour	240 (21.7)	479 (43.2)	202 (18.2)	153 (13.8)	24 (3.1)
Helps make better decisions	441 (39.8)	493 (44.5)	116 (10.5)	39 (3.5)	19 (1.7)
Future career	528 (47.7)	439 (39.6)	97 (8.8)	37 (3.3)	7 (0.6)
Theoretical	67 (6.0)	181 (16.3)	184 (16.6)	482 (43.5)	194 (17.5)
Easy	110 (9.9)	379 (34.2)	391 (26.3)	280 (25.3)	48 (4.3)

Table 3: Who would like to study more economics?

	Variable	Coefficient	exp[β]
Age	<22	*Control variable*	
	22-26	-0.122 (0.210)	0.886
	27-31	-0.952 (0.408)**	0.386
	32-36	-0.041 (0.576)	0.959
	37-41	-0.667 (0.528)	0.513
	>42	-0.109 (0.489)	0.896
Country of studentship	UK	*Control variable*	
	US	-1.034 (0.210)***	0.355
	Australia	-0.130 (0.198)	0.878
	New Zealand	-1.745 (0.962)*	0.175
	Other	-2.104 (0.967)**	0.122
Qualification	BA	*Control variable*	
	PG Diploma	-0.070 (0.587)	0.933
	MA	-1.134 (0.313)***	0.322
	MBA	0.210 (0.498)	1.234
	Other	-1.480 (0.992)	0.228
Year of study	1	*Control variable*	
	2	-0.022 (0.209)	0.978
	3	-0.125 (0.205)	0.883
	4	-0.455 (0.284)	0.634
	Other	0.940 (0.437)**	2.561
Experience	Work experience	0.354 (0.170)**	1.424
	Part-time job	0.231 (0.212)	1.259
	Economics background	0.103 (0.165)	1.108
Perceptions	Easy	0.066 (0.093)	1.069
	Theoretical	-0.121 (0.079)	0.886
	Helps future career	0.790 (0.123)***	2.204
	Better decisions	0.024 (0.118)	1.024
	Frustrating	-0.328 (0.092)***	0.721
	Understanding	0.587 (0.084)***	1.799
	Confusing	-0.344 (0.098)***	0.709
Cuts	Cut 1	-0.797 (0.784)	
	Cut 2	1.240 (0.783)	
	Cut 3	2.891 (0.790)	
	Cut 4	5.262 (0.826)	
	Log likelihood	-773.079	
	Pseudo R^2	0.217	

Notes: Ordered logistic regression. *n*= 672. Dependent variable is the extent of agreement with the statement, based on a 5 point Likert scale, that "I would like to study more economics if possible". ***, ** and * represent statistical significance at the 1%, 5% and 10% levels.

Table 4: ANOVA results

		Sum of Squares	df	Mean Square	F	Sig.
Easy	Between Groups	593.886	3	197.962	335.080	.000
	Within Groups	652.232	1104	.591		
	Total	1246.118	1107			
Theoretical	Between Groups	525.650	3	175.217	214.136	.000
	Within Groups	903.349	1104	.818		
	Total	1428.999	1107			
Future career	Between Groups	272.741	3	90.914	217.546	.000
	Within Groups	461.368	1104	.418		
	Total	734.108	1107			
Better decisions	Between Groups	290.770	3	96.923	190.857	.000
	Within Groups	560.648	1104	.508		
	Total	851.419	1107			
Frustrating	Between Groups	406.273	3	135.424	143.502	.000
	Within Groups	1040.916	1103	.944		
	Total	1447.189	1106			
More economics	Between Groups	615.778	3	205.259	294.189	.000
	Within Groups	770.275	1104	.698		
	Total	1386.053	1107			
Understand behaviour	Between Groups	447.369	3	149.123	208.639	.000
	Within Groups	789.075	1104	.715		
	Total	1236.444	1107			
Confusing	Between Groups	557.522	3	185.841	291.496	.000
	Within Groups	703.845	1104	.638		
	Total	1261.367	1107			

Table 5: Tukey's HSD results for "I would like to study more economics if possible"

Cluster Number of Case	N	Subset for alpha = .05				
	1	1	2	3	4	1
2	372		1.52			
4	338			2.31		
1	239				2.52	
3	159					3.84
Sig.			1.000	1.000	1.000	1.000

Table 6a: Tukey's HSD results for "easy"

Cluster Number of Case	N	Subset for alpha = .05		
		1	2	1
1	239	2.08		
2	372	2.17		
4	338			3.61
3	159			3.62
Sig.			.551	.999

Table 6b: Tukey's HSD results for "theoretical"

Cluster Number of Case	N	Subset for alpha = .05				
		1	2	3	4	1
3	159	2.43				
1	239		2.82			
4	338			3.63		
2	372					4.28
Sig.		1.000	1.000	1.000	1.000	

Table 6c: Tukey's HSD results for "future career"

Cluster Number of Case	N	Subset for alpha = .05				
		1	2	3	4	1
2	372	1.24				
4	338		1.53			
1	239			1.94		
3	159					2.74
Sig.		1.000	1.000	1.000	1.000	

Table 6d: Tukey's HSD results for "better decisions"

Cluster Number of Case	N	Subset for alpha = .05				
		1	2	3	4	1
2	372	1.33				
4	338		1.67			
1	239			2.14		
3	159					2.86
Sig.		1.000	1.000	1.000	1.000	

Table 6e: Tukey's HSD results for "frustrating"

Cluster Number of Case	N	Subset for alpha = .05			
		1	2	3	4	1
3	158	2.23			
4	338		2.90		
1	239			3.45	
2	372				3.97
Sig.		1.000	1.000	1.000	1.000

Table 6f: Tukey's HSD results for "understanding behaviour"

Cluster Number of Case	N	Subset for alpha = .05			
		1	2	3	4	1
2	372	1.71			
4	338		2.15		
1	239			2.72	
3	159				3.60
Sig.		1.000	1.000	1.000	1.000

Table 6g: Tukey's HSD results for "confusing"

Cluster Number of Case	N	Subset for alpha = .05			
		1	2	3	4	1
3	159	2.33			
4	338		2.82		
1	239			3.91	
2	372				4.14
Sig.		1.000	1.000	1.000	1.000

Table 7: Description of groups

Group	1	2	3	4
Do they find economics **easy**?	Hard	Hard	Easy	Easy
Do they find economics **frustrating**?	Frustrating	Frustrating	Not frustrating	Not frustrating
Do they find economics **confusing**?	Confusing	Confusing	Not confusing	Not confusing
Do they find economics too **theoretical**?		Theoretical	Not too theoretical	
Do they think economics will **help understanding behaviour**?		Doesn't help understanding behaviour	Helps understanding behaviour	
Do they **want more economics**?		Don't want more economics	Want more economics	
Do they think it will **help their future career**?		Wont help their future career	Will help their future career	Wont help their future career
Do they think it will **help improve their decision making**?		Doesn't improve decision making	Improves decision making	
Summary	**These find it difficult but not necessarily useless**	**These find it difficult and of not much use**	**These like economics, and find it easy and useful**	**These find economics easy but not much use**
Group size	239 students (131 male)	372 students (241 male)	**159** (70 male)	338 (169 male)

Table 8: Severity of problem for males

	Cluster	UK (255)	US (120)	OZ (112)	NZ (93)	Other (31)
Males	1	0.188	0.167	0.196	**0.333**	**0.323**
	2	0.323	**0.550**	0.473	0.344	0.258
	3	**0.153**	**0.058**	**0.134**	**0.054**	**0.129**
	4	0.337	0.225	0.196	0.269	0.290
	% in cluster 3 and 4	**0.490**	0.283	0.330	0.323	0.419
	Cluster	UK (202)	US (88)	OZ (91)	NZ (110)	Other (6)
Females	1	0.178	0.114	0.209	**0.382**	
	2	0.203	**0.432**	0.253	0.255	
	3	**0.248**	**0.102**	**0.176**	**0.100**	
	4	0.371	0.352	0.363	0.264	
	% in cluster 3 and 4	**0.639**	0.454	0.539	0.364	

Note: Sample sizes in parentheses. Results omitted for female-other to inhibit mis-interpretation

Table 9: Cluster membership by age and by socio-economic variable

Cluster	1	2	3	4	Sample size
Age 17-21	0.221	0.321	**0.143**	0.315	692
Age 22-26	0.227	0.367	**0.126**	0.280	286
Age 27-31	0.132	0.396	**0.113**	0.358	53
Age 32-36	0.125	0.313	**0.188**	0.375	32
Age 37-41	0.160	0.400	**0.320**	0.120	25
Age 42+	0.300	0.200	**0.200**	0.300	20
Work experience	0.212	0.357	**0.135**	0.296	680
Non-work experience	0.222	0.301	**0.157**	0.320	428
Self employed	0.244	0.347	**0.148**	0.261	176
Non-self employed	0.211	0.329	**0.139**	0.321	826
Economics background	0.237	0.336	**0.125**	0.301	758
Non-economics background	0.167	0.334	**0.183**	0.314	350
BA	0.215	0.335	**0.145**	0.305	927
Non-BA	0.221	0.337	**0.138**	0.304	181

Figure 1: "I would like to study more economics if possible"
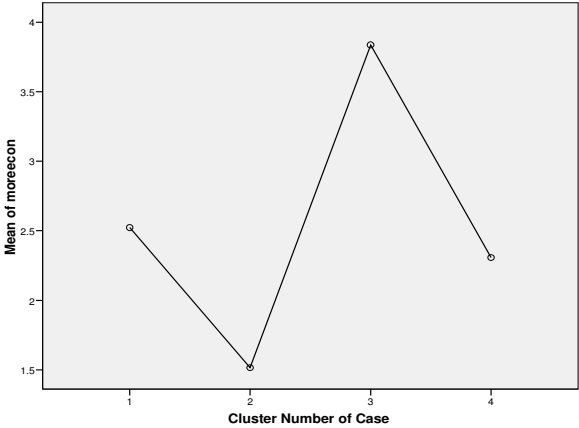
Figure 2: Histograms for each cluster on the desire for more economics study
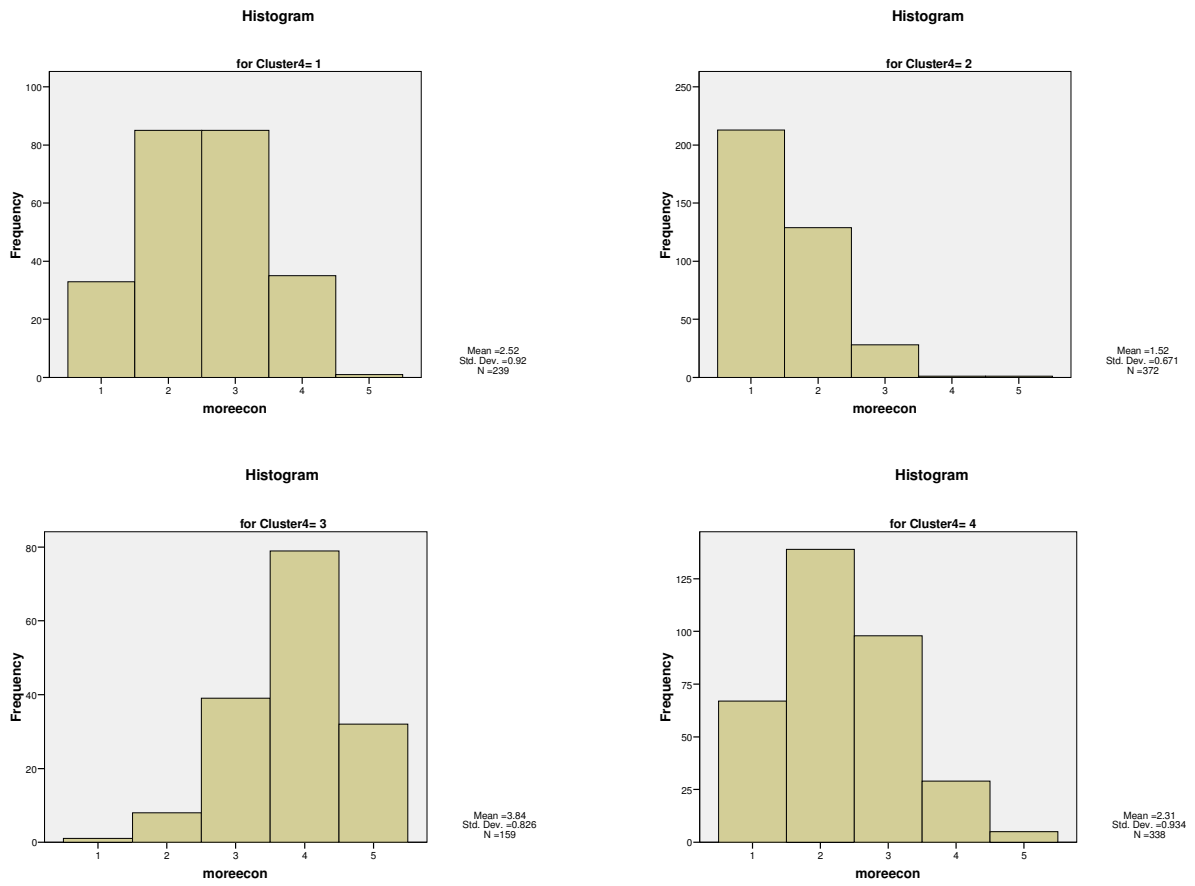
Histogram

for Cluster4= 1

Mean =2.52
Std. Dev. =0.92
N =239

Histogram

for Cluster4= 2

Mean =1.52
Std. Dev. =0.671
N =372

Histogram

for Cluster4= 3

Mean =3.84
Std. Dev. =0.826
N =159

Histogram

for Cluster4= 4

Mean =2.31
Std. Dev. =0.934
N =338

Figure 3: Box plot showing outliers of students for each cluster
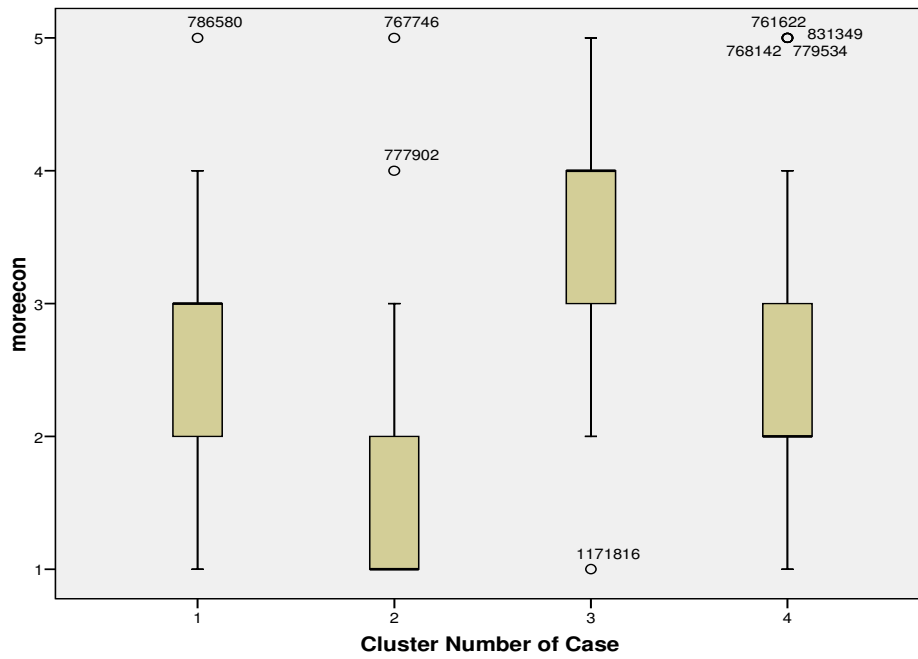
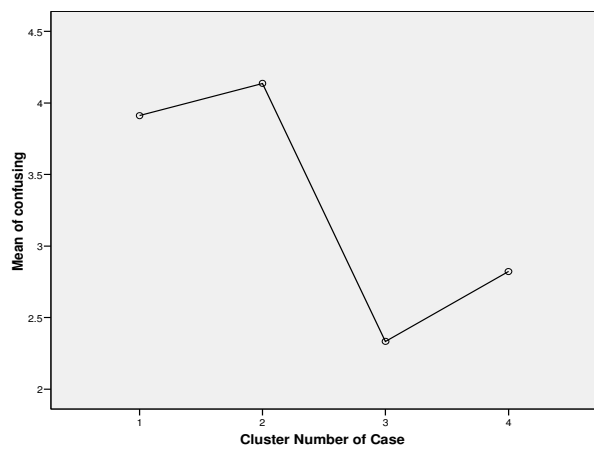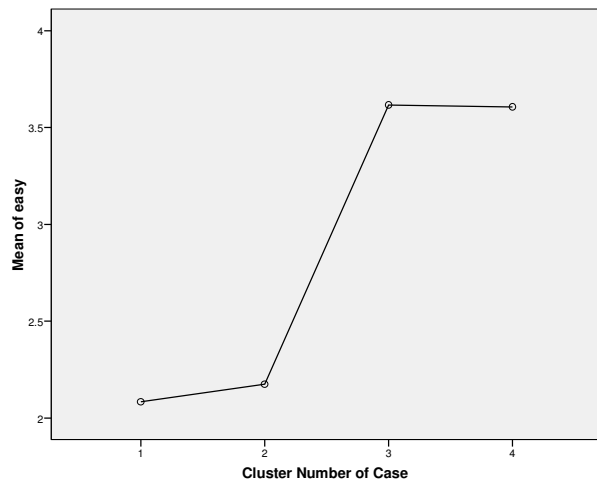**Figure 4: Means by cluster for three perceptions**
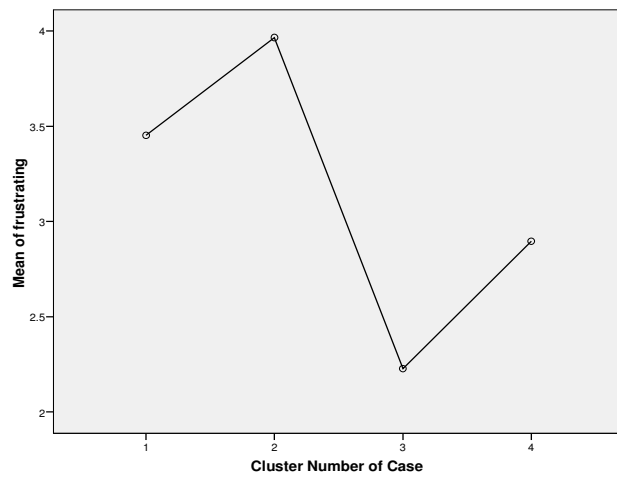
Figure 5: Severity of problem by location of education (e.g. student in a UK university)

Country based students and proportions in each cluster