An Evaluation of Pre-Enrolment and Post-Enrolment Predictors of Academic Success in Business Economics

by Dr Noel Woods, MATHLE

Acknowledgements
Anna Ridgway – Supervisor
Shane Woods – Data Input
Kathleen O'Sullivan - Statistics
The Sample

Research was conducted in University College Cork, during the 2008-2009 academic year.

166, second year, BComm, BComm Chinese, students, enrolled in the Business Economics (EC2201) module

The students consisted of 84 females and 82 males, who were largely homogeneous in terms of age.

The analysis was conducted largely on the students who entered university through the Central Applications Office (CAO) system (n=157)

Permission was granted to use their academic records and all other relevant data in the research.
What constitutes academic success?

Focus group approach

• 10 BComm students volunteered to partake in a focus group

Consensus

• Academic success was subjective, achieving your desired grade

Literature

• Broad assumption that learners who have achieved an entry level performance in their school matriculation examination will be capable of success at university.
• In general, students who enter university with higher entry scores also achieve higher academic results at university.
• However, self-efficacy and proactive attitude are both related to academic success, although neither measure directly predicted grade point average.
What influences academic success?

There is ample evidence in the literature on teaching and learning to suggest that multiple factors are likely to influence students' success at university.

Factors such as intelligence (Gardner, 1983; Gardner and Hatch, 1989, Gardner, 1999)

teaching strategies (Bartz and Miller, 1991),

students effective retention, setting appropriate goals, a good study environment, and effective time management (Tinto, 1987),

students' approach to studying, persistent and active study (Meyer, 1990),

students' motivation, self-discipline and effort (Chen and Hoshower, 2003),

cultural expectations (Ginsburg, 1992),
Aim: To evaluate factors that lecturers and students see as having important influences on student success.

**Pre-enrolment predictors**
(characteristics or achievements that occur prior to the student commencing the course in which success is being predicted)

- Points score in Leaving Certificate
- Socio-economic factors such as eligibility for a Higher Education Authority (HEA) grant,
- Whether the student received their secondary education in a public or private school.

**Post-enrolment predictors**

- Attendance at lectures.
- Attendance at tutorials.
- Hours worked per week.
- Use Blackboard, no of hits.
- Type of student accommodation.
- Level of involvement in student activities.
- Level of participation in sport.
- Response to progressive assessment (which may reflect a level of interest in subject).
- Perception/style of lecturer.
- The student’s dominant intelligence (MI).
Methods

Each participant completed the survey after the first interim assessment approximately halfway through the academic year.

Data obtained was linked to each student using his or her student number.

During the term, students were asked to complete an online survey on multiple intelligences (http://www.jobsetc.gc.ca/toolbox/quizzes/mi_quiz.do). http://www.berghuis.co.nz/abiator/lsi/mi_test.html
## Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achieved Desired Grade</td>
<td>166</td>
<td>44% achieved desired grade, 56% did not</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exam Mark</td>
<td>166</td>
<td>59.05</td>
<td>12.33</td>
<td>7</td>
<td>80.5</td>
</tr>
<tr>
<td><strong>Explanatory variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>166</td>
<td>51% Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominant Intelligence</td>
<td>104</td>
<td>35% interpersonal, 22% logical-mathematical, 20% musical</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Pre-enrolment factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leaving Certificate Points</td>
<td>166</td>
<td>467.8</td>
<td>38.24</td>
<td>210</td>
<td>555</td>
</tr>
<tr>
<td>Higher Education Grant</td>
<td>166</td>
<td>20% HEA Grant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Education</td>
<td>166</td>
<td>6% in Private schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Studied Economics in LC</td>
<td></td>
<td>30% sat for economics in LC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Post-enrolment factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living At Home</td>
<td></td>
<td>52% Living at home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attendance lecture percentage</td>
<td>166</td>
<td>56.8%</td>
<td>20.09%</td>
<td>2%</td>
<td>95%</td>
</tr>
<tr>
<td>Attendance lectures number</td>
<td>166</td>
<td>25</td>
<td>9</td>
<td>0</td>
<td>42</td>
</tr>
<tr>
<td>(Total Lectures, n=44)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attendance at tutorials</td>
<td>166</td>
<td>8</td>
<td>5.21</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>(Total Tutorials, n=19)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number hours employed</td>
<td>166</td>
<td>8.56 hours</td>
<td>7.71</td>
<td>0 hours</td>
<td>30 hours</td>
</tr>
<tr>
<td>Hours in Student activities</td>
<td>166</td>
<td>2.01 hours</td>
<td>2.79</td>
<td>0 hours</td>
<td>14 hours</td>
</tr>
<tr>
<td>Hours in personal study</td>
<td>166</td>
<td>14.97 hours</td>
<td>4.52</td>
<td>0 hours</td>
<td>30 hours</td>
</tr>
<tr>
<td>Number of Blackboard hits</td>
<td>186</td>
<td>14.33</td>
<td>12.65</td>
<td>0</td>
<td>86</td>
</tr>
<tr>
<td>Progressive assessment</td>
<td>166</td>
<td>59 responses, 36% response rate</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Student perception of factors influencing academic success

- Persistent and active study: 14%
- Motivation: 14%
- Interest in subject: 9%
- Quality of teaching: 10%
- Attendance at lectures: 19%
- Attendance at tutorials: 3%
- Self discipline and effort: 31%
Student perception of factors influencing academic failure

- Lack of study: 9%
- Inadequate goal setting: 21%
- Poor attendance at lectures: 11%
- Poor attendance at tutorials: 7%
- Lack of interest in subject: 13%
- Quality of teaching: 26%
- Poor time management: 13%
This coincides with that of Weiner (1986) who found that students tend to internalise success and externalise failure.

When students experience lack of success (failure) they tend to attribute it to a lack of effort or to an external cause (such as quality of teaching) rather than attribute it to a personal cause or lack of ability.

There is a tendency of students to attribute success to their own efforts and failure to their lecturers and this is consistent with their efforts to maintain self-esteem.

26% felt that quality of teaching was the most significant factor influencing academic failure.
Logistic Regression Model

Whether the student achieved their desired grade (Y/N) was regressed on the Pre-enrolment factors

The odds of a student achieving academic success with ≥490 leaving cert points was 3.12 times the odds of a student achieving academic success with <490 leaving cert points, adjusting for highest leaving cert grade (OR=3.12).

A student who achieved their highest Leaving Cert marks in Mathematics, Accounting, Science, Engineering, Technology and Construction is more likely to achieve their desired grade than a student who achieved their highest Leaving Cert marks in either Languages, Music and Art, or the Other category.
Logistic Regression Model

Whether the student achieved their desired grade (Y/N) was regressed on the Post-enrolment factors

Table 3: Estimation results for the post-enrolment model (n=156)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Level</th>
<th>Adjusted OR</th>
<th>95% CI for adjusted OR</th>
<th>Overall p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living at home</td>
<td>Yes</td>
<td>2.23</td>
<td>1.14, 4.36</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attend lecture percentage</td>
<td>70%-95%</td>
<td>5.69</td>
<td>1.90, 17.04</td>
<td>0.020</td>
</tr>
<tr>
<td></td>
<td>59%-70%</td>
<td>3.08</td>
<td>0.99, 9.57</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41%-59%</td>
<td>3.77</td>
<td>1.28, 11.13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0%-41%</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: the reference category is denoted in italics. Hosmer-Lemeshow goodness of fit (df=6, p=0.908)

The odds of a student achieving academic success living at home was 2.23 times the odds of a student achieving academic success not living at home, adjusting for the factor attend lecture percentage (OR=2.23).

The odds of a student achieving academic success attending 70% to 95% of lectures was 5.69 times the odds of a student achieving academic success attending 0% to 41% of lectures, adjusting for the factor living at home (OR=5.69).
Logistic Regression Model

Whether the student achieved their desired grade (Y/N) was regressed on the Pre-enrolment and Post-enrolment factors.

- The odds of a student achieving academic success with $\geq 490$ LC points was 4.60 times the odds of a student achieving academic success with $<490$ leaving cert points (OR=4.60).
- The odds of a student achieving academic success with their highest leaving cert grade in a math-related subject was 1.51 times the odds of a student achieving academic success with their highest leaving cert grade in a language-related subject (OR=1.51).
- The odds of a student achieving academic success living at home was 3.80 times the odds of a student achieving academic success not living at home (OR=3.80).
- The odds of a student achieving academic success attending 70% to 95% of lectures was 8.02 times the odds of a student achieving academic success attending 0% to 41% of lectures (OR=8.02).

The odds of a student achieving academic success declined with reduced attendance based on OR ratios.
Discussion

The results largely concur with those of Burton and Dowling (2005) that previous academic performance was a significant predictor of academic success.

• Students who achieved high points in their Leaving Certificate continue to do well at tertiary level. These students are more capable academically and have good study and exam techniques.

• Students’ who achieved their highest LC grade in the Math area do well in the Business Economics module considered in this study.

• This particular module is quite a mathematical module and would suit students with a flair for mathematics.

Students who live at home are more likely to achieve academic success also.

• Students who live at home have strong parental support units and a more stable environment.

• Students who live at home are also under parental supervision. They would be encouraged to do extra study in the evenings and not stay out too late, whereas students who do not live at home do not have this supervisory influence.

Schmelzer et al. (1987) suggested that attending lectures improved the chances of academic success.

• This is consistent with our finding that academic success is more likely if a student attends the majority of their lectures.

• This makes sense as course material is explained initially and thoroughly at lectures.

• The students have the opportunity to ask their lecturers questions if they are having difficulty with the material.

• Also, lecturers can drop hints for exams in lectures that students who do not attend would miss out on.
Findings

The hypothesis that students with a particular dominant intelligence might be correlated to academic success in business economics was not statistically significant.

This concurs largely with Gardner’s theory, that as individuals we have multiple intelligences rather than a dominant intelligence.

Three types of intelligence dominated the Business Economics students; interpersonal, logical-mathematical, and musical.

In terms of the scholarship of teaching and learning, this provides an indication as to student’s preferred learning styles, as well as their behavioural and working styles, and their natural strengths.

Gardner pointed out that managing people and organising a unique mixture of intelligence types is a hugely challenging affair.
Conclusions

First, it can provide a basis for helping lecturers reflect on their expectations of and about students so that they will be better informed about ways in which they can facilitate student learning, enhance the influence of positive factors and minimise the influence of negative factors on student success.

Second, it can provide a source for helping students to reflect on their perceptions and expectations of university study so that they can gain more control over their learning, and therefore they can approach their studies in a way that will maximise their chances of success.

Identifying the factors that influence academic performance also enables teachers to identify the “at risk” students. It is then possible to target interventions and provide appropriate support services for these students.

Identifying the pre and post-enrolment factors that lecturers and students see as having important influences on student success has the potential to be valuable.
Conclusions

It is my belief that students and lecturers have a collective responsibility for student success and that the first stage in accepting this responsibility is for both students and lecturers to gain a better understanding of the complex processes that influence student success and failure.

The findings provide information of the perceptions of students that could help academics to enhance the influence of factors that are seen as positive for student success and minimise the factors that are seen as important in student failure.

In addition, any differences between student and lecturer perceptions of the important factors could be used to assist academics to see that students do not necessarily share the same views of studying as themselves.