

Dependence of Graduation Rate on Entry Qualifications in the B.Sc. Programme at the Open University of Sri Lanka: A Case Study

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1 INTRODUCTION

By definition an Open University offers flexibility in entry qualifications, choice of courses, pace and location of study and educational media methods. These features have made it a preferred tertiary educational option for adult learners. However, it is well known that the graduation rates of Open Universities are much lower than their conventional (face-to-face F2F) counterparts (Simpson, 2015). As such Open Universities must strive to improve academic performance of students leading to increased graduation rates.

The positive correlation between cognitive ability (reflected in entry qualifications of an academic programme) and the academic performance of a student is well established (Hopkins, 1998). However, there are number of other factors that determine the academic performance of distance learners. Learner characteristics including marital status, motivation and study habits have been highlighted (Kithinji, 2017, Logan, 2017).

In Sri Lanka, selections to degree programmes in public F2F Universities are conducted by the University Grants Commission. The minimum entry qualification is stipulated as three passes in the General Certificate of Education, Advanced Level Examination (GCE-A/L) obtained in one sitting (UGC, 2017). However, the minimum entry

qualification to the B.Sc. programme at the Open University of Sri Lanka is three passes in GCE-A/L obtained in any number of sittings (or an equivalent qualification). Students who do not have these qualifications may register in the Foundation in Science programme offered by the Open University and acquire equivalent qualifications. One may argue that a student who has obtained three passes in one sitting possesses a higher cognitive ability than one who has obtained three passes in multiple sittings. As such, in order to improve graduation rates, one may suggest the revision of the minimum entry qualification to the B.Sc. to be three GCE-A/L passes in one sitting. In this communication we examine the validity of this proposal with respect to the B.Sc. degree offered by the Faculty of Natural Science.

Defining a graduation rate in an academic programme in an Open University is not straightforward since students are allowed to work towards a degree for a long period time and some may not intend to complete (Nash, 2005). The most reliable estimate of rate of graduation may be the cumulative graduation rate (Simpson, 2015). However calculation of such rates requires reliable data collected over a long period of time which is not easily accessible as at present for the B.Sc. As such we have used a simple systems view (Moore, 1996, Jackson, 2003) of the B.Sc. in studying the problem at hand.



In systems studies one often uses steady state assumption (Wikipedia, Jackson, 2003). If a system has reached a steady state with respect to a variable, then that variable becomes constant in time. We study the B.Sc. using such a steady state assumption.

1.1 Research questions

1. How far is steady state assumption valid in studying the relationship between entrants and graduates of the BSc programme?
2. How do the graduation rates among cohorts of graduates with different entry qualification compare?

2 METHODOLOGY

The learners entering and graduates produced in the B.Sc. are categorised (represented by symbol α) into three;

Category 1 ($\alpha = 1$):

Three GCE-A/L passes in one sitting and no Foundation in Science qualifications.

Category 2 ($\alpha = 2$):

Three GCE-A/L passes in multiple sittings or equivalent qualifications (e.g. London A/L qualifications) but no Foundation in Science qualifications.

Category 3 ($\alpha = 3$):

Foundation in Science qualifications with or without GCE-A/L passes.



Figure 1: B.Sc. process model

Distance education may be viewed as a system with a set of connected processes (Moor, 1996). There we do not worry about the progress of individual students and concentrate on the macroscopic variables that describes the processes in the system. B.Sc. is a subsystem of the Open University. We represent the total number of entrants and graduates in the B.Sc. in category α ($= 1, 2$ or 3) in a particular year, y , by the variables $S_\alpha(y)$ and $G_\alpha(y)$, respectively; see Figure 1. Then the total number of learners entered and graduates produced in year y are given by,

$$S(y) = S_1(y) + S_2(y) + S_3(y)$$

And

$$G(y) = G_1(y) + G_2(y) + G_3(y),$$

respectively.

We assume that the B.Sc. subsystem is in steady state with respect to the percentage of entrants and the percentage of graduates in each category. In other words we assume that the percentages s_α and g_α in equations (1) and (2) are independent of the year, y .

$$100 \times S_\alpha(y) / S(y) = s_\alpha$$

$$\text{for } \alpha = 1, 2, 3 \dots\dots\dots(1)$$

$$100 \times G_\alpha(y) / G(y) = g_\alpha$$

$$\text{for } \alpha = 1, 2, 3 \dots\dots\dots(2)$$

We define the graduation rate, $R_\alpha(y)$ in each category, α in year y by

$$R_\alpha(y) = 100 \times G_\alpha(y) / S_\alpha(y)$$

$$\text{for } \alpha = 1, 2, 3 \dots\dots\dots(3)$$

By substituting in equation (3) from equations (1) and (2) you obtain



$$R_{\alpha}(y) = (g_{\alpha}/s_{\alpha})[100 \times G(y)/S(y)] = (g_{\alpha}/s_{\alpha})R(y) \quad \text{for } \alpha = 1, 2, 3 \dots \dots \dots (4)$$

Where $R(y) = 100 \times G(y)/S(y)$ is the overall graduation rate in year y . Thus the graduation rate in a category in any year, y , is equal to a constant factor (characteristic of the category) multiplied by the overall graduation rate.

We have studied s_{α} and g_{α} for three years. As shown in the next section their

values from one year to the other are close indicating the approximate validity of the steady state assumption. Using this fact we have obtained a better estimate of s_{α} and g_{α} , (denoted by \bar{s}_{α} and \bar{g}_{α}) by averaging them over the entrant and graduate populations over the three years. These average values were used in final calculations.

3 RESULTS AND DISCUSSION

We have studied the entrant populations in the B.Sc. in the academic years 2014, 2015 and 2016, and the graduate populations in years 2013, 2014 and 2015. The data were obtained from the Open University Management Information

System (OMIS). Relatively few entrants and graduates without entry qualifications in OMIS were omitted from the calculations. Table 1 summarizes the data we used in the calculations.

Table 1: Summary of data

Category α	Number of entrants, $S_{\alpha}(y)$			Number of graduates, $G_{\alpha}(y)$		
	y = 2014	y = 2015	y = 2016	y = 2013	y = 2014	y = 2015
1	817	756	1042	145	194	292
2	29	44	57	8	8	13
3	113	79	109	28	37	50
Total	959	879	1208	181	239	355

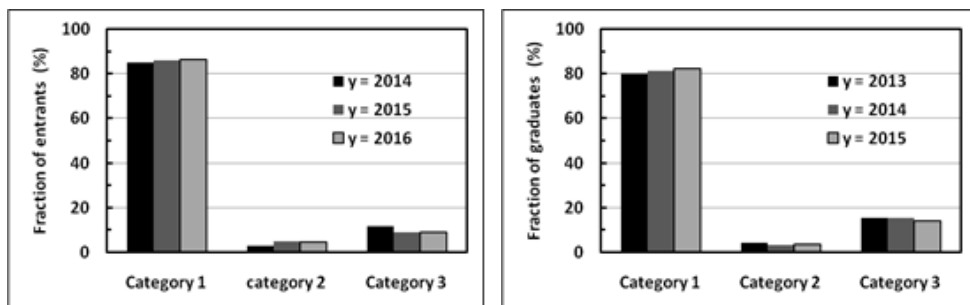


Figure 2: Percentages of entrants and graduates; $100 \times S_{\alpha}(y)/S(y)$ and $100 \times G_{\alpha}(y)/G(y)$.

Figure 2 shows the percentages of entrants and graduates as defined in equation (1) and (2).

It is observed that the largest percentage, 80% – 86%, of entrants as well as graduates is in category 1. Category 2 has the smallest percentage, 3% – 5%. It is important to observe that from year to year percentage of entrants in each category does not change much. The same is true with the graduates. These observations confirm the approximate validity of the steady state assumption we have made.

Table 2 indicates the graduation rate in each category calculated using equation (4) and using \bar{s}_α and \bar{g}_α in place of s_α and g_α .

Table 2: Graduation rates in year y

Category	\bar{s}_α (%)	\bar{g}_α (%)	$R_\alpha(y)$
1	85.8	81.4	0.9 $R(y)$
2	4.3	3.8	0.9 $R(y)$
3	9.9	14.8	1.5 $R(y)$

Table 2 reveals that the graduation rates of students with 3 GCE-AL passes in one sitting and 3 passes in multiple sittings are the same. This is in agreement with the findings of Logan and Kithinji that with distance learners, factors other than cognitive ability are important in determining academic performance. This result indicates that one may not be able to increase graduation rate in the B.Sc. by not allowing registration to the students with three GCE-AL passes in multiple sittings.

Table 2 also indicates that the graduation rate is highest with students who have followed Foundation in Science courses which are offered through the distance mode. This is in agreement with the general observation that the academic

performance can be higher with distance learners who have prior experience in distance learning.

With the available data, the validity of the steady state approximation could be verified over three years. Reliability of the results could be improved by performing the calculations over a larger number of years.

4 CONCLUSIONS AND RECOMMENDATIONS

Approximate validity of the steady state assumption for the percentages of entrants and graduates in three categories in the B.Sc. has been verified over three years.

The graduation rate is highest with the entrants who have followed the Foundation in Science courses.

The graduation rates among entrants with 3 GCE-AL passes in one sitting is the same as among entrants with 3 pass in multiple sittings. As such one may not observe an improvement in graduation rate in the B.Sc. by altering the entry qualification to require 3 GCE-AL passes in one sitting. Also, it is observed that the fraction of entrants with 3 passes in multiple sittings is very small. Hence, even in a case where the graduation rate among them is high, such entrants will not have a high impact on the overall graduation rate.

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