การออกกลางคันของนักศึกษามหาวิทยาลัยในจังหวัดปัตตานี

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บทคัดย่อ

การศึกษาในครั้งนี้ได้นำข้อมูลนักศึกษาระดับปริญญาตรี ปีการศึกษา 2542-2546 จำนวน 6,610 ระเบียนมา
วิเคราะห์โดยใช้โมเดลทางสถิติ เพื่ออธิบายการออกกลางคันของนักศึกษามหาวิทยาลัยสงขลานครินทร์ วิทยาเขต
ปัตตานี สถิติที่นำมาใช้ในการวิเคราะห์ คือ odds ratios และ logistic regression โดยใช้ odds ratios วิเคราะห์หา
ความสัมพันธ์ระหว่างการออกกลางคันกับ คณะ กลุ่มศาสนา-เพศ ปีการศึกษา และใช้ logistic regression วิเคราะห์
อิทธิพลร่วมของตัวแปร คณะ ปีการศึกษา กลุ่มศาสนา-เพศ ต่อการออกกลางคันของนักศึกษาโดยภาพรวมใน 5 ปี
ที่ผ่านมาพบว่า มีอัตราการออกกลางคันร้อยละ 12 โดยคณะวิทยาศาสตร์และเทคโนโลยี เป็นคณะที่มีอัตราการออก
กลางคันมากกว่าคณะอื่น ๆ โดยเฉพาะในปีการศึกษา 2542 นอกจากนี้ อัตราการออกกลางคันได้เพิ่มสูงขึ้นหลังจาก
ปีการศึกษา 2544 โดยที่นักศึกษามุสลิม มีอัตราการออกกลางคันต่ำกว่านักศึกษากลุ่มอื่น ๆ แต่มีข้อมูลไม่เพียงพอ
ที่จะกล่าวว่านักศึกษาที่จบจากโรงเรียนเอกชนสอนศาสนาอิสลาม และโรงเรียนมัธยมทั่วไป มีอัตราการออกกลางคัน
แตกต่างกัน

คำสำคัญ: การถดถอยลอจิสติก, การออกกลางคันในมหาวิทยาลัย, ภาคใต้ของประเทศไทย, อัตราส่วนออด

Discontinuation among University Students in Pattani

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Abstract

This study uses a statistical model to explain the discontinuation of university study at Prince of Songkla University (PSU), Pattani campus in southern Thailand. University records for 6,610 bachelor degree students enrolled between 1999 and 2003 were used. The effects of faculty and religion-gender group on discontinuation rates were analysed by odds ratios, while a logistic regression model was used to determine the joint effects of faculty, year of admission and religion-gender group on discontinuation. The overall discontinuation rate over the five year period was 12%, with the Faculty of Science and Technology having a higher discontinuation rate than the other faculties, particularly for students admitted in 1999. The discontinuation rates were higher for students entering after 2001, with Muslim students having lower drop-out rates than other students. There was no evidence of a drop-out difference between Muslim students entering university from Islamic high schools and those coming from public high schools.

Keywords: logistic regression, odds ratios, southern Thailand, university discontinuation

Introduction

University drop-out is a serious world-wide problem, even in advanced countries such as the UK (Smith and Naylor, 2001; China Education and Research Network, 2005). Failure by a student to complete the degree attempted damages both the student, in economic and psychological aspects, and the broader society by reducing the skills needed for its development. Smith and Naylor (2001) found that the university discontinuation is influenced by the extent of prior academic preparedness, as well as social integration at the university. Ngoma et al (2006) found that work place activities caused most students to drop out. Johnes and Taylor (1989) looked at non-completion rates of UK universities and found that the main determinants were the scholastic ability of each university's new entrants, the subject mix of each university, and the proportion of each university's students accommodated in a hall of residence. In Italy, the most important determinants of drop-out were student's family and the educational background of their parents as well as the type of high school attended (Cingano and Cipollone, 2003). Bennett (2003) found that financial hardship was a powerful influence on their drop-out decision for Business Studies students at a new university in Italy.

In Thailand, several studies have addressed drop-out in vocational colleges but most are written in Thai and thus unavailable to the international research community. They generally find that the main reason is personal factors such as financial shortage, health problems, lack of basic knowledge and poor time management, college factors such as strict college rules and instructor or counselor conflict, family factors such as a lack of parental guidance or conflicts with home duties, and social factors, such as conflict with friends, differences in social strata, and conflicts in life style.

Our study is based on data routinely collected by the Registrar's Office for students who enrolled at Pattani Campus of Prince of Songkla University (PSU) in southern Thailand from 1999 to 2003. This campus is of interest because it is the only public university in the predominantly Muslim southern region of Thailand, which comprises four provinces with a total population of 1.92 million according to the 2000 Population and Housing Census of Thailand. It uses a statistical model to account for the discontinuation rate of university study based on year of admission, faculty, gender and religious affiliation. By identifying students who are at high risk of discontinuing, such a model could assist educational authorities to introduce better strategies for reducing the number of drop-out. Discontinuation in this study is defined as students who lapsed, retired, resigned or transferred. Given that many of the Muslim students attending Pattani campus of PSU come from Islamic high schools, our study also examined these students' previous high school attendance as a possible determinant of discontinuance in their study.

Methodology

Data used in the current study were taken from records kept by the Registrar's Office at Pattani Campus of PSU. These records contain details about the students' background including their gender, religious affiliation, home town and previous study at an educational institution, as well as their current enrolment record including admission date, degree enrolled in, faculty, major area of study, and outcomes

(graduated, still studying, or discontinued with date and cause of such discontinuation). As of 31 March 2005, these records were imported into an SQL database and extensively checked for accuracy. Inconsistencies and blanks due to data entry errors and omissions were thoroughly checked against paper records and either corrected if possible or recoded as "not stated".

For each cell defined by the combination of year of admission, faculty enrolled in, gender and religious affiliation, we computed the proportion of students who had discontinued before the end of March 2005. Since less than 2% of students did not have their religion recorded and all but 1% of those who did gave their religion as either Muslim or Buddhist, the student's religious affiliation was coded simply as "Muslim" or "other".

Odds ratios were used to assess the effects of faculty and religion group on the discontinuation rates for each year. Since each of these two factors has four categories rather than two, in each case we defined the odds ratio as the ratio

$$w = \frac{p_1/(1 - p_1)}{p_2/(1 - p_2)},$$

Where p_1 is the proportion of admitted students discontinuing in the specific faculty (or religion-gender group) and p_2 is the corresponding proportion discontinuing in the other groups combined. The conventional asymptotic formula for the standard error of the log-odds ratio is

$$SE[\ln(w)] = \sqrt{\frac{1}{a_1} + \frac{1}{b_1} + \frac{1}{a_2} + \frac{1}{b_2}},$$

where a_1 and b_1 are the respective numbers discontinuing and continuing in the specific faculty or group and a_2 and b_2 are the corresponding numbers in the other groups combined.

The odds ratio is a measure of the strength of an association between two binary variables. If the two proportions being compared are equal, the odds ratio is 1, indicating that there is no association between the determinant and the outcome variables. But if the proportions are different from each other, the odds ratio is different from 1.

We used these formulas to compute confidence intervals for each set of odds ratios, which were then plotted to facilitate the comparison of discontinuation rates. In the final analysis we used logistic regression to model the joint effects of these factors, and assessed the adequacy of the model by plotting standardized residuals against normal scores.

Results

Excluding the two newer faculties that commenced bachelor degree programs in 2002, there were 6,610 students who were admitted to four-year bachelor degree programs between 1 June 1999 and 31 October 2003. The data thus comprise all students who enrolled to commence a four-year bachelor degree in one of the four major faculties over the five-year period from 1999 until 2003 inclusive. Table 1 shows the total numbers of students admitted by year of admission, faculty and religion-gender group, together with the numbers who had discontinued before 31 March 2005. Most students who discontinued did so within two years of admission. Note that the student population is dominantly female

Table 1 Numbers of students admitted to and discontinued from 4-year bachelor degrees at Pattani Campus of PSU by faculty, year of admission, and religion-gender group

Faculty	Year admitted	Muslim male		Muslim female		Other male		Other female	
		Total	Disc.	Total	Disc.	Total	Disc.	Total	Disc.
Education	1999	10	0	41	0	47	5	148	13
	2000	16	2	68	2	48	8	137	7
	2001	12	0	60	6	61	7	227	24
	2002	28	3	94	5	83	15	352	36
	2003	28	1	146	17	58	9	258	31
	Total	94	6	409	30	297	44	1122	111
Humanities	1999	15	0	32	2	98	17	267	21
	2000	20	1	57	3	62	9	208	18
	2001	20	1	61	2	93	13	360	42
	2002	56	3	128	9	118	14	399	60
	2003	76	12	155	16	88	15	303	47
	Total	187	17	433	32	459	68	1537	188
Science and Technology	1999	11	4	15	7	70	29	79	9
	2000	14	3	7	0	64	17	86	7
	2001	14	2	18	2	85	16	106	14
	2002	22	2	26	4	82	14	136	20
	2003	26	4	45	14	91	25	153	40
	Total	87	15	111	27	392	101	560	90
College of Islamic Studies	1999	22	0	63	3	0	0	0	0
	2000	34	0	86	2	0	0	0	0
	2001	71	7	124	8	1	0	3	0
	2002	78	8	181	12	4	1	1	1
	2003	58	6	195	8	0	0	1	0
	Total	263	21	649	33	5	1	5	1
Total		**631**	**59**	**1602**	**122**	**1153**	**214**	**3224**	**390**
Percent discontinued	**11.9**	**9.4**		**7.6**		**18.6**		**12.1**	

and the proportion of Muslim students entering rose from 23% in 1999 to 43% in 2003.
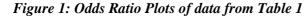
Table 1 also shows that the discontinuation rate fluctuated around 11% over the period 1999-2002 and then jumped to 14.6% in 2003, a percentage which could increase even further with drop-outs in the further two years of study. We also see the drop-out rates were substantially lower for Muslim students than for other students, particularly males.
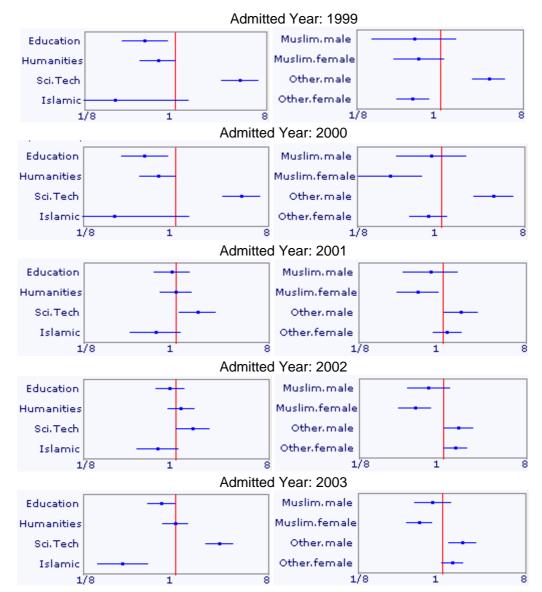
Figure 1 shows plots of odds ratios with 95% confidence intervals for comparing discontinuation rates for each year between the four faculties (left panels) and four religion-gender groups (right panels). Comparing the discontinuation rates by faculty over

Figure 1: Odds Ratio Plots of data from Table 1

the five years, the pattern is consistent. We see a greater propensity for students to drop out if they enrolled in the Faculty of Science and Technology, particularly for students admitted before 2001 and in 2003. A similar result is seen for non-Muslim men compared to the other three religion-gender groups.

When these rates are compared by religion-gender group, we can see that Muslim students had consistently lower discontinuation rates than other students, but among non-Muslim students, the men had higher discontinuation rates than the women in the earlier period, but these rates had converged by the end of the period.

Table 2 shows the results after fitting a logistic regression model, based on the proportions in the 75 cells in Table 1 containing at least one student.

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Table 2   Results from fitting a logistic regression model to the data from Table 1

Factor	Coefficient	St. Error	p-value
Discontinued/Continued	-2.776	0.215	
Faculty:			0.0000
Education	0	-	
Humanities	0.177	0.098	0.0720
Science & Technology	0.606	0.115	0.0000
Islamic Studies	-0.196	0.180	0.2756
Admitted year:			0.0000
1999	0	-	
2000	-0.016	0.182	0.9309
2001	0.242	0.163	0.1371
2002	0.354	0.156	0.0226
2003	0.644	0.155	0.0000
Religion-Gender:			0.0000
Muslim.male	0	-	
Muslim.female	-0.183	0.173	0.2898
Other.male	0.614	0.174	0.0004
Other.female	0.279	0.163	0.0865
Interaction:			0.0000
Not 1999 Sci.Tech	0	-	
1999 Sci.Tech: Muslim.male	1.610	0.666	0.0157
1999 Sci.Tech: Muslim.female	2.219	0.557	0.0001
1999 Sci.Tech: Other.male	1.209	0.298	0.0001
1999 Sci.Tech: Other.female	-0.160	0.394	0.6838

The model initially fitted contained additive effects for faculty, year of admission, and religion-gender group, giving a residual deviance of 108.25 with 64 degrees of freedom (p = 0.0005). Since the standardized residuals were substantially higher from the cells corresponding to students admitted to the Faculty of Science and Technology in 1999, we refitted a model containing four additional parameters, one for each religion-gender group for these students, and thus arrived at an acceptable fit to the data (residual deviance 76.2 with 60 df, p = 0.078). The corresponding estimates and their standard errors are show in Table 2.

The final logistic regression model indicates that faculty, year of admission, and religion-gender group were statistically significantly associated with discontinuation. The Faculty of Science and Technology had a higher discontinuation rate than the other faculties. Furthermore, the discontinuation rates in admission years 2003 and 2002 were higher than those in 1999 and 2000. For the Faculty of Science and Technology in 1999, all students admitted had high discontinuation rates with the exception of non-Muslim women.

Figure 2 shows the corresponding plot of standardized residuals against normal scores for

the final model. Two high outliers appear in the residuals plot. The highest (3.22) is for the cell for non-Muslim women admitted to the College of Islamic Studies in 2002, containing just two students of whom one discontinued. The other (2.94) comes from the cell for Muslim women admitted to Faculty of Science and Technology in 2003, and this group comprises 45 students of whom 14 discontinued. Table 3 shows the discontinuation rates for these students in the majors for which the rates were high.

With respect to high school of origin, we focus on the period 2000-2003 because these data were incomplete in 1999. Table 4 shows the association between discontinuation and attendance at an Islamic high school for the 2,024 Muslim students who were admitted during this period.

Table 5 shows the same comparison for Muslim students admitted to Faculty of Science and Technology. The odds ratio for the association between discontinuing and having attended an Islamic high school is thus 1.72 with 95% confidence interval (0.74, 3.95).

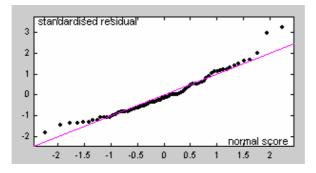*Figure 2: Standardized residuals plot for model shown in Table*

Table 3 Majors of Muslim women admitted to the Faculty of Science and Technology in 2003

Majors	Admitted	Discontinued	Drop-out Rate
Physics	6	5	83 .3%
Fisheries Technology	7	4	57.1 %
Applied Mathematics	13	4	30.8 %
Other Majors	19	1	5.3 %
Total	**45**	**14**	**31.1 %**

Table 4 Outcome and school type for Muslim students admitted in 2000-2003

Type of high school	Admitted	Discontinued	Drop-out Rate
Islamic	798	66	8.3 %
Public	1194	97	8.1 %
Not Stated	32	2	6.2 %
Total	**2024**	**165**	**8.2 %**

Table 5 Outcome and school type for Muslim students admitted to the Faculty of Science and Technology in 2000 -2003

Type of high school	Admitted	Discontinued	Drop-out Rate
Islamic	37	10	27.0 %
Public	132	20	15.2 %
Not Stated	3	1	33.3 %
Total	**172**	**31**	**18.0 %**

Conclusions

The conclusions are as follows:

(a) Overall percentages of the discontinuation rate were 9.4, 7.6, 18.6 and 12.1 for the four religion - gender groups (Muslim male, Muslim female, other male and other female).

(b) The discontinuation rates increased with year. For the Faculty of Science and Technology in 1999 there was a high discontinuation rate with the exception of non-Muslim women.

(c) For Muslim students, there is no evidence that the high school from where the students entered university affected the discontinuation rate.

Discussions

The data analysed provide information on discontinuation among students at Prince of Songkla University, Pattani Campus. It was found that, there were statistically significant association between faculty, year of admission, religion-gender group and discontinuation.

Faculty of Science and Technology had the highest discontinuation rate. This is consistent with the earlier results reported by Rincome (2002), that the most discontinued students were from Faculty of Sciences at Chiang Mai University. His/Her study indicated that the non-completion rate was higher in some subjects than in others. The reason to leave prematurely in some subjects than in others is not clear. Perhaps some subjects are simply easier to fail than others (Johnes and Taylor, 1989).

However, it may be difficult to discuss the increasing discontinuation rates with year and the high rate in 1999 for students from Faculty of Science and Technology. This is because the data do not provide information on the reason of selection into university and the reason for discontinuation. Additionally, some students who were observed to drop out may return to study later, possibly elsewhere.

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