

**RESEARCH ARTICLE**

## **Academic achievement of Thai pharmacy students in an English-taught program**

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**Abstract**

Learning and teaching in a second language presents a significant barrier to Thai students and challenges to teachers. This is particularly true for professional subjects in higher education with a high technical and communication content, such as the health sciences. This study reports the progression and outcome over five years of three parallel undergraduate pharmacy programs; two taught in the native Thai language, and one completely in English language. Because the three programs have equivalent setting, resources and curriculum, it is therefore interesting to compare their performance head to head, and learn lessons from the admission procedures, student achievement, and progression. The need for rigorous entrance selection criteria with faculty entrance examinations is demonstrated. Data would seem to show that English competency, although important, is not the most important criteria for academic success, but innate academic ability, intention to become a professional, and motivation are keys to a good outcome. The "value added" of learning on an English or international program is difficult to observe within the standard examination methods of the higher education system, but is clearly a benefit for the workplace.

## Introduction

In 2004, the Faculty of Pharmaceutical Sciences, Khon Kaen University (KKU), a publicly funded higher education institute, established the first English-taught 5-year Bachelor of Pharmacy program in parallel to the two standard well-established Thai programs, so called Thai-1 and Thai-2 programs. (Pongcharoensuk and Prakongpan, 2012). The English-taught program is among very few second language pharmacy programs offered anywhere in the world and most are in the Middle East (Kheir *et al*, 2008).

The Asian Economic Community (AEC) is due to be effective in 2008, and as a part of the AEC, Thai students are seeking for career development and English usage. English usage in teaching for Thai students was aimed to provide advantage or to keep abreast of their career within the international environment.

The three pharmacy programs are different in the way of student enrollment. Students in the Thai-1 program are recruited by examinations organized by national or local authorities. Students enrolled in the Thai-2 program and English-taught program are recruited by Faculty self-directed examinations. English program students had to pass English usage test with analytical skills, reading, listening, essay and an interview. However, students in all programs utilize the same setting, resources, and curriculum. The 5-year curriculum consists of 4 years of course work study, including subjects in basic sciences, medical sciences, pharmaceutical sciences, pharmaceutical care and electives, and another 1 year of professional training.

All pharmacy programs have been accredited by the Pharmacy Council of

Thailand which expects that qualified professional pharmacists are trained with well-balanced knowledge, morals and wisdom and essential skills for pharmacy profession. In order to become a registered pharmacist, each graduate was subjected to take the National Licensure Examination (NLE), provided by the Pharmacy Council of Thailand. In general, the NLE are divided into 2 examination sets which are the multiple choice questions (MCQ) and Objective Structured Pharmaceutical Examination (OSPE).

English as a second language is a barrier to Thai learners who are handicapped when dealing with listening, reading, speaking and writing. Inability or inexperience of teaching in English could be a co-factor which might discourage students' eagerness. Other factors influenced the success or failure includes students' academic background, motivation and competitiveness.

This study aimed to investigate the academic achievement of students in the English-taught program, in comparison to that of students in the two Thai-taught programs. Lessons learned from evaluation of the academic outcomes in the three programs may capture some barriers required to be eliminate for their learning success.

## Methods

Data of student enrollment in 2004 were retrieved from the admission records from the University Admission Office for the Thai-1 students. Data of the Thai-2 and English-taught programs were gathered from in-house. The first and fourth year

cumulative grade point average (GPAs), therein are referred as GPAX1 and GPAX4, respectively, were obtained for all students from database of the University Registrar office. GPA, being an average of individual grades from all taught courses, generally the grades might be equivalent to percentage score, as follows: GPA 4.0 being ≥80; GPA 3.5 being 75-79.9 ; GPA 3.0 being 70-74.9; GPA 2.5 being 65-69.9 ; GPA 2.0 being 60-64.9; GPA 1.5 being 55-59.9; GPA 1.0 being 50-54.9; GPA 0 being <50. The relationship between those GPAX4 and GPAX1 was investigated. Data of National Licensure Examination (NLE) score on individual student were provided by the Pharmacy Council of Thailand. Data on job assignments were obtained in August 2009 by a telephone survey to each individual graduate 6 months after their graduation.

Statistical analysis for association was used depending upon the type of level of measurement, i.e., SPSS for Windows V11.0 or Stata Version 10.0 was used for comparison of GPAX1 and GPAX4 and GPAX4 among the three programs. Pearson correlations (*r*) were analyzed with a significance level at 0.05. Chi-square test for

association between National Licensure pass rate and type of program. Post hoc analysis were used to compare the mean of NLE scores among three programs.

### Results and Discussion

For optimization of facilities and staff provision on teaching and learning, students were grouped into 3 sections based on enrollment procedure. There were 161 students enrolled in 2004, as pharmacy students. Among these 14 students resigned before the end of the program mainly to switch to the other schools. Two students from the Thai-2 and two from the English-taught program dropped out as they did not reach the minimum requirement GPA of <2.0 (Table 1). The rate of graduation of the English-taught program was somewhat lower than the Thai-2 group (85% vs 87%, respectively, Table 1) but much lower than the Thai-1 group (85% vs 96%, respectively, Table 1). At year 4 of the program, the majority of the students in all programs were female, shown in Table 2. The English-taught program consisted of 43 students with the highest proportion of female students of 84%.

**Table 1** Student entrance and progress data

Number	Program		
	Thai-1	Thai-2	English
Applicants	*	856	528
Admitted	60	49	52
Resigned	7	2	5
Persisted through the	53	47	47
Dropouts with GPA<2.0	0	2	2
Not finished in time	2	4	5
Graduates	51 (96%)	41 (87%)	40 (85%)

\* Data not available due to entrance examination being organized by central national system

**Table 2** Number of students in each program at academic year 4

Gender	Program			Total
	Thai-1	Thai-2	English	
Female	33 (66%)	35 (80%)	36 (84%)	104 (76%)
Male	17 (34%)	9 (20%)	7 (16%)	33 (24%)
Total	50	44	43	137

To investigate the influence of the entrance examination process, and what indicators might be best used for selection, a number of relationships between student entrance profiles and GPAX4 or GPAX1 were analyzed. In addition to year 1, year 4 was chosen as at this point as it represents the bulk of their formal university education; year 5 is composed largely of clerkship placements for training in hospitals, community pharmacies, industry, etc.

Of the National Entrance Examination subjects (Social Studies, English, Mathematics, Chemistry, Physics, Biology), Chemistry ( $r=0.621$ ,  $p=0.005$ ,  $N=19$ ) and Biology scores ( $r=0.524$ ,  $p=0.021$ ,  $N=19$ ) showed significant correlation with GPAX4. The combined total entrance score for all subjects, however, showed good correlation ( $r=0.775$ ,  $p<0.001$ ,  $N=19$ ) with GPAX4 and GPAX1 ( $r=0.583$ ,  $p<0.009$ ,  $N=19$ ), although data for all students in the group were not available.

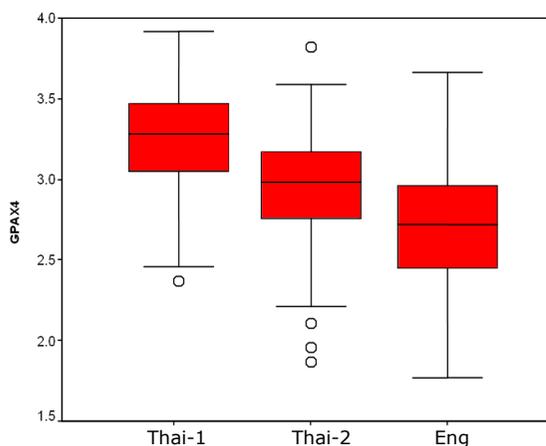
Overall competency tested by the Faculty Self-directed Entrance Examination for the English-taught program showed no correlation with GPAX4 ( $r=0.155$ ,  $p=0.322$ ,  $N=19$ ). This is a one day examination comprising section with GRE/GMAT type questions testing logical problem solving, analytical reasoning, reading comprehension, an English essay and an interview. Scores for the English essay and English listening comprehension showed no correlation with GPAX1 or

GPAX4. Surprisingly, the oral interview score correlated weakly with GPAX4 ( $r=0.331$ ,  $p=0.030$ ,  $N=43$ ) but not significantly with cumulative GPA at year 1 (GPAX1) ( $r=0.239$ ,  $p=0.123$ ,  $N=43$ ).

Table 3 shows the GPA of students in first semester of year 1 versus year 4. In year 1, the Thai-1 program had significantly higher average GPA than the Thai-2 and English programs ( $p<0.05$ ), and also in year 4. From year 1 to year 4 for the Thai-1 and Thai-2 program average GPA significantly increased ( $p<0.05$ ), but the English program showed no change in average GPA.

Academic performance of the students from these 3 programs showed fairly normal distributed grades with mean GPAX4 from those from Thai-1, Thai-2 and English of 3.5, 3.1 and 2.9, respectively. Among these, there were 2 students from Thai-1, 4 from the Thai-2, and 5 from the English-taught program obtained total GPA  $< 2.0$  particularly in the core subjects (not finished in time; Table 1). This meant that they had to repeat some core courses to improve their grades up to the standard requirements for graduation.

ANOVA analysis of the GPAX4 for each group indicates that this GPA of the English program are significantly lower than the Thai groups ( $p < 0.05$ ), shown as box plots in Figure 1.



**Figure 1** Comparison of GPA at the 1<sup>st</sup> Semester of Year 4

**Table 3** Comparison of GPA at 1<sup>st</sup> Semester Year 1 and 1<sup>st</sup> Semester Year 4

Program	N		GPA	
			1 <sup>st</sup> Semester Year 1	1 <sup>st</sup> Semester Year 4
Thai-1	50	Mean±SD	3.2±0.4**	3.5±0.4*
		Max	3.9	4.0
		Min	2.3	2.3
		CV	11.4%	12.7%
Thai-2	44	Mean±SD	2.87±0.30	3.14±0.56*
		Max	3.60	4.00
		Min	2.28	1.48
		CV	10.38%	17.7%
English	43	Mean±SD	2.83±0.47	2.90±0.46
		Max	4.00	3.85
		Min	2.00	1.96
		CV	16.75%	15.82%

Mean CV = Coefficient of Variation, \* p<0.05 compared with same program at Year 1, \*\* p<0.05 compared with Thai-2 and English-taught program in the same year

Interestingly, GPAX1 correlated strongly with GPAX4 for all programs (r=0.837, p<0.001, N=43 for the English-taught program, r=0.853, p<0.001, N=50 for the Thai-1 program and r=0.830, p<0.001, N=44 for the Thai-2 program). These data indicate that the cumulative GPA

at year 1 is a very good indicator of what the students GPA will be at graduation. It would seem that any individual student performance and potential shows itself clearly very early, and that this is the strongest predictor of successful graduation GPA and academic success.

A pharmacist license is required to work as a pharmacist at a hospital, drug store, and even pharmaceutical manufacturing in Thailand. The students, who completed the course work in Khon Kaen University Faculty of Pharmaceutical Sciences by February 2009, took NLE in March 2009. NLE is given by the Pharmacy Council of Thailand twice a year. The examination is composed of two parts, MCQ and OSPE. Average pass rates over the previous five-year period were 78.3 % (ranging 50.0 – 95.9%) for graduates from national universities and 33.2% (ranging 28.2 – 38.3%) for graduates from private universities. The pass rate of Asian countries varied, e.g., 30% in Taiwan (the licensure examination is held twice a year, so, it is about 50% per year) (Shen *et al*, 2008) and 12.8 – 18.2% in China (Shao *et al*, 2008). Table 4 shows the results of the NLE of these graduates from the 3 programs. The English-taught graduates obtained the lowest passing rate of 66.7%, when compared to those in the Thai-1 and Thai-2 programs of 95.9 and 87.8, respectively. The questions in the MCQ test were basically to assess the pharmacy context. Mean MCQ score for the English-taught group was  $65.5 \pm 6.7\%$  which was above the requirement of this test set at

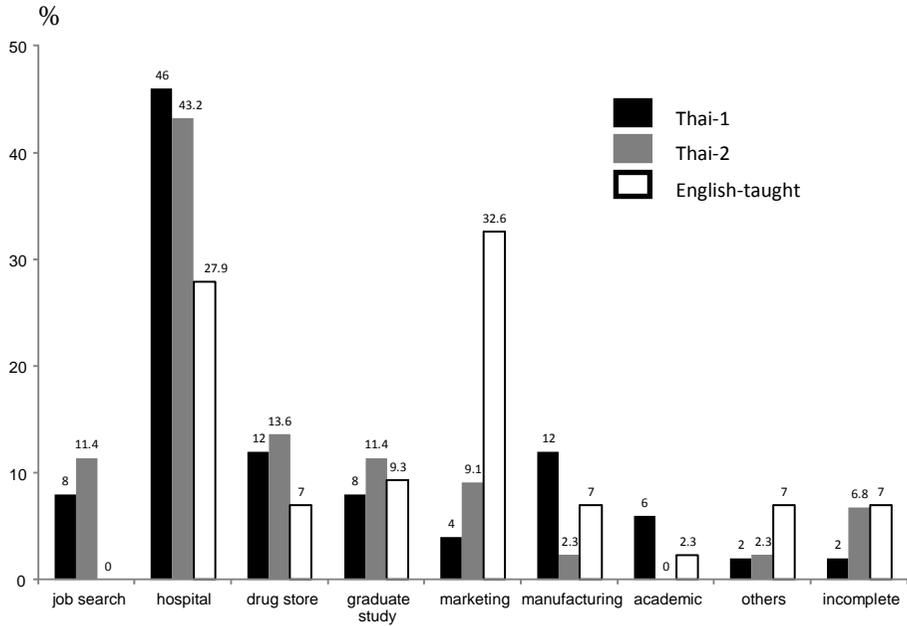
60.0%. For OSPE, the mean score for graduates from the English-taught group was  $83.6 \pm 4.8\%$  which was higher than the requirements of 80%, but lower than those of the two other Thai programs. The OSPE test was aimed to examine the practices and techniques used in pharmacy professions. In this light, it seems that the English-taught students were better in practice capability than the context in pharmacy. The lower pass rate of the graduates from the English-taught program would be due to the fact that they faced a challenge in using Thai language in the examination.

Job placements of the graduates were compared in Figure 2. Six months after graduation, all English-taught students got jobs. Almost half of the graduates from the Thai-1 (46%) and Thai-2 (43.2%) programs became hospital pharmacists, in the governmental setting. On the contrary, one-third of English-taught graduates (32.6%) worked as medical representatives, and most of them worked for foreign pharmaceutical companies in Thailand. Hospital pharmacists ranked second for this group of graduates (27.9%), most of them being in private hospitals which required English-fluent pharmacists.

**Table 4** Pass rate and mean scores in the National Licensure Examination

Program	Pass rate (%)	MCQ score (mean $\pm$ SD)	OSPE score (mean $\pm$ SD)
Thai-1 (n=49)	95.9	73.55 (5.6)	85.71 (4.1)
Thai-2 (n=41)	87.8	69.7 (7.0)	86.0 (5.0)
English (n=39)	66.7 <sup>a</sup>	65.5 (6.7) <sup>b</sup>	83.6 (4.8) <sup>c</sup>

<sup>a, b, c</sup> The mean difference from the other programs is significant at the 0.05 level



**Figure 2** Job placements (%) of pharmacy graduates from students enrolled at pharmacy program at Khon Kaen University in 2004 compared students in Thai -1 (black columns), Thai - 2 (grey columns) and English-taught (white columns).

In the present study, it was found the good correlation between the entrance examination and interview that may be attributed to staff ability in assessing English skills, academic background, motivation and student intention to pursue pharmacy as their career. Thus the interview would seem to be an important element in the student selection process.

So far, entrance examination has been the only selection method for the right students, there is still no other alternative method. Academic ability in basic sciences, logical, analytical and problem solving skills, and English comprehension (reading and listening), intention to become a pharmacist, ethics, and maturity to adapt to the new learning environment are essential but not evaluated in this paper.

The pass rates of the NLE for graduates of the English-taught program were found at significantly lower pass rate, when compared to the two other Thai programs. Almost all of the graduates have found jobs related to pharmacy profession, and 100% from the English program found jobs within 6 months, even those who did not pass the NLE. The most popular job for the Thai-1 and Thai-2 program graduates was hospital pharmacist, but for the English program it was medical representative.

It is difficult to assess the extent to which English language is a barrier to learning for this program. The future assessment on this matter is of essential to be evaluated.

It is clear that the English program in pharmacy education in Thailand has the potential to educate

pharmacy students for working in many sectors of the pharmacy profession. The advantage of the English program for international opportunities should be monitored and investigated in the future.

### **Conclusion**

The objective of this study was to compare the academic outcomes of the students from Faculty of Pharmaceutical Sciences, Khon Kaen University in the English program to that in the two Thai programs. Academic outcomes evaluated in this study included GPAX1, GPAX4, rates of passing the NLE for graduates, and ability to gain job employment. Results revealed the entrance examination correlated well with the interview and seemed to be the important element for the student selection process. The graduates from the English-taught program showed the significantly lower pass rate of the NLE than those from the Thai programs. Even though, they could find jobs within 6 months after graduation. Their main job was medical representative while those from Thai-1 and Thai-2 programs were mostly hospital pharmacist.

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