

RESEARCH

Academic Performance and Personal Experience of Local, International, and Collaborative Exchange Students Enrolled in an Australian Pharmacy Program

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Objective. To assess the academic performance and experiences of local, international, and collaborative exchange students enrolled in a 4-year Australian bachelor of pharmacy degree program.

Methods. Survey instruments exploring the demographics, background, and academic and cultural experiences of students during the program were administered in 2005 to students in all 4 years. Additionally, grades from each semester of the program for students (406 local, 70 international, 155 exchange) who graduated between 2002 and 2006 were analyzed retrospectively.

Results. The main differences found in the survey responses among the 3 groups were in students' motivations for choosing the degree program and school, with international and collaborative exchange students having put more thought into these decisions than local students. The average grades over the duration of the program were similar in all 3 demographic groups. However, local students slightly outperformed international students, particularly at the start of the year, whereas collaborative exchange students' grades mirrored those of local students during the 2 years prior to leaving their home country of Malaysia but more closely mirrored those of international students in the final 2 years after arriving on campus in Australia.

Conclusion. Despite differences in academic backgrounds and culture, international and exchange students can perform well compared to local students in a bachelor of pharmacy program and were actually more satisfied than local students with the overall experience. Studying in a foreign country can negatively influence academic grades to a small extent and this is probably related to adjusting to the new environment.

Keywords: bachelor of pharmacy degree, academic performance, university experience, international students, exchange students

INTRODUCTION

Australian universities are increasingly reliant on income derived from international students.¹ In many cases, the students who apply to the university enter directly into the first year along with local students. However, often universities will establish formal arrangements with overseas institutions. These include collaborative exchange arrangements (referred to in Australia as “twinning” arrangements and “articulation agreements”). Under such arrangements, the students study in their home institution for a period of time and then enter the Australian degree partway through the program. Often these arrangements involve faculty members from the host college or school

traveling to the other school to teach a portion of the curriculum. Within the field of health sciences, this type of arrangement works best when the degree is structured in such a way that foundation sciences are taught during the early years, prior to clinical competencies, which are developed later in the program. Because of these arrangements, within bachelor degree programs in Australia there are 3 broad groups of students: local students and international students, who enter and complete the entire pharmacy program at the Australian institution; and collaborative exchange students who complete the same curriculum in their home country for the first part of the program, then relocate to Australia to complete the professional courses taught in the latter years of the program. These 3 groups represent students who have 3 potentially different educational experiences, and this may impact their academic learning.²

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The School of Pharmacy and Medical Sciences at the University of South Australia offered a 4-year pharmacy collaborative exchange program with SIT International College in Malaysia from 1999 to 2010. In the first year, the courses were predominantly foundational/basic science courses, such as chemistry and biology, taught using a combination of lectures and traditional laboratory sessions. In the second year, the courses were still largely science based but more applicable to pharmacy (eg, pharmaceuticals, pharmacokinetics, microbiology), and also delivered using relatively traditional teaching and assessment methods. The exchange students spent the first 2 years of the degree in Malaysia and then the third and fourth years in Adelaide, Australia, learning alongside local and international students who were at the same point in the program. In the third and fourth year of the bachelor of pharmacy degree program, the curriculum was predominantly clinical and practice focused, with a much greater emphasis on case studies and oral assessment. When these programs were first established in 1999, educators assumed that the exchange students would have essentially the same educational experience as the resident/local and international students. A university education should involve more than simply obtaining good grades or achieving professional competencies. Ideally, students should have a wider social and cultural experience that becomes part of their personal growth during their undergraduate years. Thus, students moving between countries part way through their study may influence their professional growth as well as their academic grades. It is therefore important to determine the motivations of students and their engagement with university life in addition to simply considering academic achievement. By understanding the influence of these factors on the academic achievement and the wider university experience of students, whether they be local, international, or exchange students, we will be better placed to facilitate the optimal university experience for all students. At the start of undergraduate studies, there is a period of academic adjustment for students which may impact their learning.³ While this adjustment period has been well documented for students in the first year of their degree, the implications of this initial adjustment period may be different for local and international students. Furthermore, exchange students may experience 2 adjustment phases during their undergraduate education: the well-recognized adjustment period upon initial entry into the degree program in their homeland, and a second adjustment period upon beginning the third year of study in Australia. Southeast Asian students tend to form close study groups among themselves.⁴ If this tendency is typical among the exchange students from Malaysia who enter the Australian pharmacy program, and they are able

to move as a cohort from their original learning institution with pre-established study groups and strong peer-support networks, this may lessen the effects of the transition.

The timing of the move of exchange students from their home institution to the Australian institution coincided almost exactly with the change in teaching from that of basic sciences to the more applied clinical/practice teaching. There is a common belief that Asian students do much better when the teaching is factual and lecture based than when critical-thinking and problem-based learning approaches are used.^{4,5} Therefore, there are 2 possible major influences on the academic performance of exchange students during the third year of the program: the move from studying in their home country to studying in Australia, and the change in emphasis in teaching material and methods used in the curriculum. To determine whether either of these factors has a significant effect on the academic performance of exchange students, we compared their academic performance and experiences in the program to those of local and international students over the entire 4 years of the program.

METHODS

The conduct of student surveys and use of student grades as part of this project was approved by the University of South Australia Human Research Ethics Committee. A paper-based survey instrument was administered to pharmacy students in all 4 years including first- and second-year exchange students located on the Malaysia campus during the final semester of 2005. While the precise number of students attending the lecture in which the survey was administered was not known, collection of the survey instrument in class ensured close to a 100% return rate. For the purposes of the survey, students were divided into 12 subsets: 4 groups by year times 3 groups by demographics (international, exchange, and local). The survey instruments collected demographic data and included 14 open-ended questions that explored the motivation of students in terms of their selection of degree and teaching institution, their experiences within and perceptions of the program, and their overall experience during their time at the university. Responses to each question were manually grouped into themes using methods described by Taylor-Powell and Renner.⁶ Two or 3 themes within each subset were identified.

In 2010, a retrospective analysis was conducted to determine the mean grades for each semester of the program for local (n=405), international (n=70), and exchange (n=152) pharmacy students who completed the bachelor of pharmacy degree program between 2002 and 2006. A multivariate analysis of variance with Bonferroni post hoc comparisons was conducted. The variance within

the groups that was attributable to gender was partialled out by entering gender as a factor in the model.

RESULTS

Four hundred fifty-six survey instruments were returned. The demographics of students returning the survey instruments are summarized in Table 1. Of the 43 themes identified, 24 showed no differences between subgroups. Nine of the themes demonstrated differences between students in different class years (Table 2). Ten of the themes demonstrated differences among students in the 3 demographic groups (Table 3).

Analysis of the student responses to the survey questions indicated that students' perception of the pharmacy program, their own learning within that, and engagement with university life was reasonably consistent across the subgroups analyzed. Many of the differences in responses to questions between year groups related directly to the changing nature of the program from year to year. Students in the first 2 years emphasized that practicals were the best aspect of teaching as they liked to make pharmaceutical products and believed that hands-on learning helped their learning and was interesting. As the program progressed, these were largely replaced by applied pharmacotherapeutics workshops and experiential placements, which were seen as providing experience relevant to the students' intended career.

Students' perception of their own strengths showed a marked shift between the first and fourth years of the program. In the earlier years, students were more likely to define their particular strengths in relation to a specific subject (eg, chemistry, maths, pharmacokinetics), whereas in later years they were more likely to discuss their strengths in terms of critical thinking or knowledge application.

Several themes not directly related to the structure of the program were identified. For example, more of the first-year students indicated that they were surprised by the greater independence required for university study (often cited as "a lack of spoon feeding") compared with high

school. As the students progressed through the program, they were less likely to comment on the need for independent study. All year groups considered that meeting students from different cultures was an important aspect of university life. However, first-year students were much more likely to mention this compared with students in other years. The first-year exchange students based in Malaysia at the time of the survey were just as likely to discuss cultural diversity as were the international students, who had relocated from many different countries.

When comparing survey responses from students across the 3 demographic groups, the most obvious differences related to the thought processes of the students when choosing the subject or the teaching institution. All groups identified that having good career prospects was a major factor when choosing to undertake pharmacy. However, international and exchange students were more likely to enter pharmacy because of a personal interest in either basic or health sciences compared to local students.

When choosing which university to attend, local students overwhelmingly chose the institution by default in that it was the only local institution offering pharmacy. Many of these comments had a negative tone because of the lack of choices available to them as the institution was the only one in the state offering a pharmacy degree program.

In contrast, international and exchange students chose the university on the basis of affordability, having considered university fees and/or the cost of living in the city, or they chose the university on the basis of its reputation or a recommendation from others. While some used university marketing tools (eg, the school's Web site) to obtain their information, many learned about the program from senior students or from family contacts.

Local students were much more likely to complain about the need to undertake foundation science courses which they often saw as irrelevant to their chosen career and even considered that they were weak in these courses – a perception that was not supported by the analysis

Table 1. Demographics of Students Enrolled in a Bachelor of Pharmacy Degree Program

Year	Adelaide Campus, Years 1-4								Adelaide Campus, Years 3-4			
	Local Students				International Students				Collaborative Exchange Students From Malaysia			
	Total	M	F	Median Age	Total	M	F	Median Age	Total	M	F	Median Age
1	60	19	38	19	23	7	15	19.5	62	16	45	19
2	60	33	26	19	29	9	20	21	60	14	42	20
3	27	11	15	20	11	3	8	21	33	4	28	22
4	43	11	31	22	16	5	10	23	32	8	23	23
	190 ^a	74	110		79	24	53		187	42	138	

^a Gender not always specified.

Table 2. Differences in Pharmacy Students' Responses Regarding the Bachelor of Pharmacy Program Based on Year in Program

Question and Response	Year 1	Year 2	Year 3	Year 4
How does the teaching in pharmacy compare to what you expected before entering the degree?	n=163	n=168	n=68	n=95
More independence required than expected, % (SD)	19 (6)	11 (5)	7 (1)	4 (3)
What do you like best about the pharmacy program?	n=151	n=194	n=77	n=125
Practicals, % (SD)	22 (4)	33 (3)	16 (8)	10 (4)
Work experience/placements, % (SD)	5 (7)	4 (1)	23 (7)	29 (10)
Applied pharmacotherapeutics (PBL) workshops, % (SD)	0	0	22 (15)	28 (1)
What do you think your particular strengths and weaknesses are in relation to the courses you have undertaken to date?				
strengths:	n=82	n=85	n=29	n=52
One or more basic science subjects, % (SD)	33 (9)	22 (9)	11 (13)	5 (4)
Ability to apply knowledge or think critically, % (SD)	1 (1)	16 (7)	12 (7)	17 (7)
Are there any aspects of the program that you feel have either enhanced or detracted from your learning experience?				
Enhanced:	n=38	n=59	n=22	n=42
Placements, % (SD)	2 (3)	19 (6)	30 (9)	50 (14)
Applied Pharmacotherapeutics (PBL) Workshops, % (SD)	0	0	38 (22)	19 (18)
How does university life help in providing wider social and/or cultural experiences for students?	n=137	n=141	n=58	n=87
Meet friends from different cultural backgrounds, % (SD)	58 (9)	37 (4)	21 (11)	26 (4)

of course grades (Figure 1). Local students were also more likely to express negative sentiments regarding the program. For example, in response to the question "How does the teaching in pharmacy compare to what you expected before entering the degree?" local students were the most likely to indicate that it was not meeting their expectations.

Local students also believed that the structure of the pharmacy program hindered their wider university experience (Table 3). Significantly more local students than international or exchange students felt that social activities were the best aspect of the pharmacy program and were more likely to criticize non-therapeutics courses as irrelevant. They were also more likely to express negative sentiments towards staff members or other students, particularly international students/Asians, who some perceived as receiving preferential academic treatment because they paid higher fees than the locals.

There were no differences between groups in students' perceptions of their ability (or inability) to apply critical thinking skills or their ability to memorize/learn by rote. Similar percentages of each of the 3 demographic groups considered their communication skills to be a strength. Although international and exchange students were more likely than local students to identify their communication skills as a weakness, some of these students indicated that they believed they had improved in this area.

The mean semester grade point average for each semester over the 4 years for all 3 student groups is given in Figure 1. During the first half of the course (semesters 1 to 4), the international group performed at a lower standard than the local or exchange students, who were comparable in performance. However, over the last half of the degree program, the performance of local students increased compared to their performance in the first half. This was also the case for international students; however, their performance along with that of the exchange students was still below that of local students. The performance of exchange students in the first half of the degree maps closely with that of the local students, but in the second half of the program, their performance was identical to that of the international students. Although the performance of local students appeared to be consistently better than that of international students, the gap between the 2 groups narrowed in the second half of the years (semesters 2, 4, 6, and 8). Female students outperformed male students throughout the program, with the only exception to this trend being semester 1 for international students and semester 3 for exchange students.

DISCUSSION

The study results did not support the perception that Asian students are not at the same level as Australian

Table 3. Differences in Pharmacy Students' Responses Regarding the Bachelor of Pharmacy Program Based on Demographic Group

Question Response	International	Collaborative Exchange	Local
What were your reasons for choosing to undertake pharmacy? Interest in the subject, % (SD)	n=105 44 (2)	n=241 54 (1)	n=293 35 (7)
What were your reasons for choice of institution? Proximity to home/ only pharmacy program available in SA, % (SD)	n=104 8 (7)	n=249 2 (4)	n=200 87 (6)
Affordability (of either fees or cost of living in Adelaide), % (SD)	24 (13)	40 (7)	2 (2)
Good reputation of the university and/or program, % (SD)	25 (7)	28 (9)	4 (2)
What do you like best about the pharmacy program Social aspects, % (SD)	n=96 1 (1)	n=218 2 (3)	n=233 16 (7)
What do you think your particular strengths and weaknesses are in relation to the courses you have undertaken to date? Strengths: Good work ethic, % (SD)	n=45 19 (7)	n=84 1 (2)	n=119 7 (8)
Weaknesses: One or more basic science subjects, % (SD)	n=64 11 (8)	n=127 9 (11)	n=142 29 (10)
Communication skills, % (SD)	23 (16)	34 (13)	7 (5)
How do you feel about the current structure of the pharmacy program? Too many irrelevant courses and not enough therapeutics, % (SD)	n=67 2 (3)	n=176 0	n=172 21 (10)
Does the structure of the pharmacy program help or hinder this wider experience? Hinders, % (SD)	n=61 21 (14)	n=138 14 (11)	n=154 37 (7)

students in applied learning courses because of their reliance on rote learning rather than application and critical-thinking methods, which is in line with other literature in the area.^{4,5,7-9} All student groups tended to do well in semesters 1 or 2, found semesters 3 and 4 relatively difficult, and improved during semesters 5 through 8, indicating that the perceived differences in learning styles between cultural groups either did not exist or had no influence on average course grades within this program. The decline in average grades for all demographic groups in year 2 suggests that an apparent “sophomore slump”^{10,11} occurs regardless of which of the 3 demographic groups the student is a member.

The survey results also indicated homogeneity of the student cohort in their development as they moved through the program. Students perceptions of learning change as they progress through university.¹² The shift in comments from all 3 student groups is in line with this as students mature from seeing learning as acquisition of knowledge in the first year to applying or understanding knowledge in later years.

This homogeneity is not just reflected in students' learning. Students from all 3 groups appeared to have

struggled with the level of independence required in the first year, but at the same time were excited to meet new peers from different backgrounds. All students appeared to have adapted quickly to their new environment, with fewer comments related to these experiences made by students in later years of the program.

Despite the similarities among the groups, there were small but statistically significant differences in average grades. In the first semester international onshore students obtained lower grades than either the local or exchange students. There are a number of potential reasons for this. These students simply may have been less capable than students in the other 2 groups. However, other than in the third semester of the program, international students' grades were comparable with those of local and/or exchange students at all other time points. Also, international students had to meet the same high admission standards, suggesting that academic capability was not an issue. The vast majority of international students in the program are drawn from Southeast Asian countries. Because an International English Language Testing System entry score of 6.5 (and some subscores of 6) is permissible, these students' command of the English language is not as strong

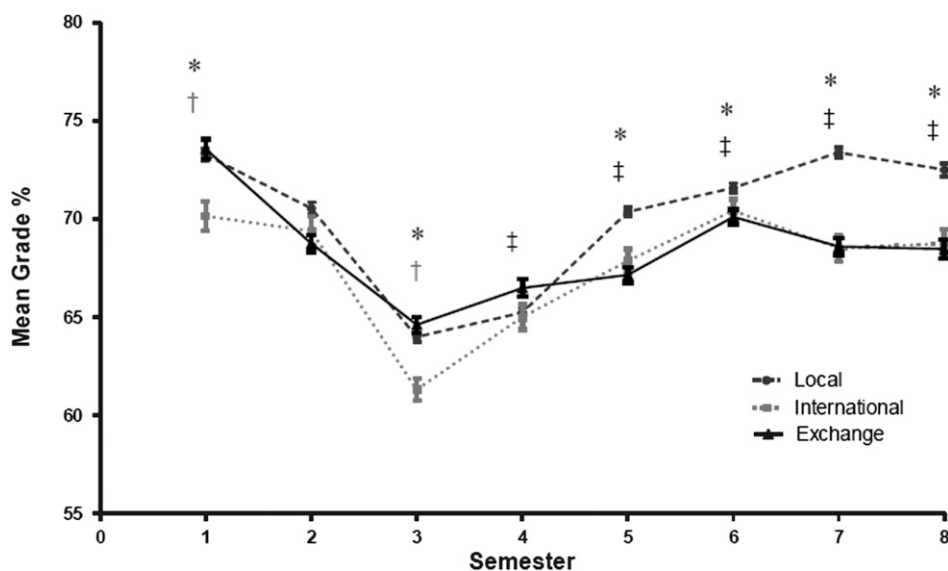


Figure 1. Mean semester average grades (\pm SEM) of local, international, and exchange students. Footnotes: * = $p < 0.05$ local vs international; † = $p < 0.05$ exchange vs international; ‡ = $p < 0.05$ local vs exchange.

as that of locals or even as strong as many Malaysian exchange students.

The language barrier may be particularly relevant in the first semester when the students are adjusting to being taught in English, possibly made more challenging by the mix of Australian colloquialisms and unfamiliar accents that they inevitably encounter.⁸ In many of the courses taught in semesters 5 through 8, there is an emphasis on patient counselling. Hence, those students being assessed in this area who have English as a second language would be expected to do less well. Arguably, this expectation could be self-fulfilling in a subjective assessment of oral communication skills as this prior expectation in itself could subconsciously lead to the awarding of lower grades.^{13,14} Also, the author's own experience in conducting oral assessments with some of these students is that they grossly underperform during the assessment, but once the assessment is over and the tape recorder turned off they are able to articulate their thoughts in relation to the assessment at a high level.

For all students, there is a period of academic adjustment at the start of their studies.³ This effect is likely to be greatest for the international onshore students during the first semester when they are likely to suffer distress because of feelings of isolation.^{8,15} Relatively few local students in the program relocated to Adelaide from surrounding towns or elsewhere within the country. Hence, most local students need only to adjust to university study, while international students have to set up accommodations, get used to living independently, adjust to a new city and cultural environment, etc. Similarly, the exchange

students remain in Malaysia, many of them at home or close to home, for the first 2 years of study, so they could almost be considered "local" students during the first 2 years in terms of the impact of language and cultural factors on their academic performance and perceptions. Notably, at the end of semester 4, the average grades for the exchange students were the highest of the 3 groups, but at the end of semester 5, they were the lowest.

The exchange students' move away from Malaysia to study in Adelaide at the beginning of semester 5 coincided with the introduction of more applied courses into the curriculum. Thus, another explanation for the relatively poor performance of exchange students in semester 5 is that their Asian background and associated style of learning did not equip them well for courses on applied subjects. However, this argument can be countered if we consider the data obtained from international onshore students. These students are of predominantly Southeast Asian background and actually showed a significant improvement in their grades between semester 4 and 5. Hence, it is more likely that the stumbling block for exchange students in semester 5 was adjusting to a new environment.

One other possibility that could affect the grades obtained by exchange students compared with those obtained by local and international students is the way in which their studies were structured. All students covered the same study material, with the same teaching modalities, had equivalent assessments, and were taught largely by the same faculty members, with the exception that the Malaysian host institution used its own faculty members

to teach the non-specialized enabling sciences (approximately 50% of year 1 and 2 courses). However, subjects studied by local and international students were done so in parallel with teaching activities spread evenly throughout a semester for any given subject. In contrast, when faculty members traveled to Malaysia to teach the exchange students they tended to teach the material in intensive 2-week blocks. This raises a possible explanation that the strong results achieved by the exchange students in comparison to the other groups in the first 4 semesters were a result of the block teaching, and that when they went to Adelaide and experienced the more traditional longitudinal style teaching curriculum with larger class sizes, the positive effect of the block teaching was lost. With so many confounding factors occurring during this transitional time for the exchange students, it is difficult to draw a firm conclusion without conducting a cross-over study of the 2 teaching methods.

International and exchange students entered the program after giving much greater consideration to their options than local students do. They had a greater interest in the subject matter taught in the program compared to local students and they were less likely to express negativity towards courses, lecturers, and other students. The deeper motivation to learn among Asian students compared to local Australian students has been documented elsewhere.⁹ Further study is needed to determine whether this reflects a difference in ability, character, or culture between Asian and Australian students, or whether these results are simply a reflection that any student who is studying overseas, regardless of country of origin, is part of a self-selecting group with positive attributes that distinguish them from students who stay at home.

CONCLUSIONS

Course grades of international students can be affected by the need to adjust to their new environment. This is well recognized for international students in their first year of studying abroad, but is also an important factor for students who relocate part way through their studies. This finding has implications for universities that establish exchange programs with foreign institutions.

Although there may be a slight disadvantage in terms of lower academic grades for students who move to another country to study, these students appear to be more motivated, more likely to engage with the degree program

and university life in general, and have less negative attitudes regarding their experience.

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