English-medium instruction in Singapore higher education: policy, realities and challenges

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English-medium instruction in Singapore higher education: policy, realities and challenges

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ABSTRACT
Within the Asian region, Singapore has long been seen as a leader within the field of higher education, with an unmatched record of success in implementing English-medium instruction (EMI) at all levels of education, including colleges and universities. This present study reports on a large-scale survey carried out at one of Singapore’s major universities on the use of English as a teaching medium at both undergraduate and postgraduate level. Key findings from the survey foreground the difficulties and needs of students coping with EMI instruction at undergraduate and postgraduate levels. One important result here highlights the specific problems of overseas postgraduate students (including many from mainland China), a finding that resonates with the sociolinguistics of higher education in many other international universities in an era of global education.

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Chinese graduate students; English-medium instruction (EMI); higher education; language policies; language surveys; Singapore

Introduction

In recent decades, the Singapore government has invested impressively in higher education, and over the last 16 years there has been a dramatic expansion in higher education, with the number of universities increasing from two to six, which has been financed by a massive government investment in infrastructure, teaching and research. From the early 1990s onwards, Singapore has rolled out a succession of five-year plans to improve science, technology and innovation, with funding rising from 2 billion in 1991 to 19 billion Singapore dollars for the latest five-year plan, which will run from 2016 to 2020 (Lim 2016). Some of this funding has been used to effect the internationalisation of the nation’s universities, and by 2013 around 70% of faculty at Nanyang Technological University (NTU) were from overseas, compared with around 50% at the National University of Singapore (NUS), where President Tan Chorh Chuan was quoted as claiming that the use of English as the designated teaching medium was a ‘tremendous advantage’ (Matthews 2013). The government’s promotion of English as the sole teaching medium in education may be traced back directly to policies from the mid-1960s until the early 1980s, so that by 1987 the status of English as the sole medium of instruction at all levels of education had been secured (Leimgruber 2013; Bolton and Botha 2017). Indeed, in terms of language policy, Singapore might well claim that its emphasis on the use of English as virtually the sole teaching medium at all levels of education represents a major success story in contributing to Singapore’s claim to achieving the highest levels of English proficiency in the Asian region (Bolton 2008).

This study draws on the results of a research project conducted at a major Singaporean university (henceforth identified as the ‘University’), which set out to survey the use of English by
undergraduate and postgraduate students, the linguistic needs of students, as well as areas of perceived difficulty in using English as a medium of instruction. Notwithstanding the fact that, by many international measures of excellence, English-medium instruction (EMI) in Singapore is often presented as an outstanding success story, one important issue that interested us was the extent to which students faced particular difficulties arising from the use of English as the predominant medium of instruction. A second question was the degree to which the needs of students at the undergraduate and postgraduate levels were similar or different. A third issue that interested us was the question of which areas of academic communication needed most improvement, while the fourth and final, and somewhat broader, research issue was the extent to which the realities of language use in the University instantiated the official policy of using English as the sole medium of instruction. In this article, we provide a discussion of the sociolinguistic background in Singapore, with particular reference to the use of English in higher education. Following this, we present the quantitative results of the survey, followed by a discussion of qualitative comments that were submitted by both teaching faculty and students, and which serve to highlight a number of problematic areas in what is otherwise an impressively well-organised and successful institution.

Previous research relevant to the current study

In contemporary Singapore, the use of English as the sole or predominant teaching medium is accepted and unchallenged at all levels of education, although, historically, the issue of English-medium education has had a complex history from the origins of the British colony in 1819 through to self-governing independence in 1965 (Bolton and Botha 2017).

The origins of the present system of English-medium tertiary education date from 1949 and the foundation of the University of Malaya which was later successively renamed as the 'University of Singapore', and the 'National University of Singapore', or (using the usual Singaporean acronym) 'NUS' (Sai 2013). The establishment of NUS in 1980 was followed by the foundation of NTU in 1991, as well as four younger universities in the 2000s, namely Singapore Management University (2000), SIM University (2005), Singapore University of Technology and Design (2009) and Singapore Institute of Technology (2009). It is important to note that English is the sole official medium of instruction at all of these institutions, as is also the case at all other levels of public education in Singapore. Over the past five decades, educational policy has been guided by two key objectives of Lee (1966) and successive governments, which is to build a modern economy and to create a sense of Singaporean national identity and as Singapore’s economy has developed, educational priorities have shifted accordingly (OECD 2011, 160). In the 1960s, the emphasis was on labour-intensive manufacturing, in the 1970s and 1980s on skill-intensive production, while from the 1990s onwards Singapore has set out to excel in the global knowledge economy and to attract innovative engineering and scientific companies to establish themselves here. Today, throughout the whole system, there is a strong focus on mathematics, science and technical skills, and mathematics and science are core subjects for all primary and secondary students, while, in higher education, more than 50% of programmes are devoted to science and technology (OECD 2011, 168).²

As noted above, there are currently six local universities in Singapore, providing degree programmes to some 90,000 students. In the 2010 census, some 22% of the resident non-student population in Singapore had obtained a university-level qualification, up from just over 11% a decade earlier (Department of Statistics 2010, 8).³ In addition to the six Singaporean universities, there are five polytechnics providing three-year diploma courses to over 70,000 students (Ministry of Education 2015). The five polytechnics are Nanyang Polytechnic, Ngee Ann Polytechnic, Republic Polytechnic, Singapore Polytechnic and Temasek Polytechnic. A number of foreign universities have also established branch campuses in Singapore, including INSEAD (Institut Européen d’Administration des Affaires), the University of Chicago Graduate School of Business, the University of Pennsylvania’s Wharton School, Massachusetts Institute of Technology, Technische Universität Eindhoven, Technische Universität München, the Georgia Institute of Technology and Johns Hopkins
University (Ng and Ng 2010; Ng 2013). Singapore’s educational ambitions have spurred its two major universities to develop rapidly and to compete strongly on the international stage. In the latest QS World rankings for 2016–2017 NUS is ranked 12th in the world and NTU in 13th place, with both institutions gaining wide international recognition for their research and publications.

Language planning and language management have played an important role in the development of Singapore’s knowledge economy, and, over the last three decades, there has been a noticeable shift in the sociolinguistic profile of Singapore society, which in significant part has resulted from government-promoted language policies (Cavallaro and Ng 2014). In the late 1970s, only a small minority used either English (5.2%) or Mandarin (1.3%) as a home language, but now 34.9% of the population report using Mandarin as the usual home language, compared with 36.9% for English. Within the Chinese community, the promotion of Mandarin since the late 1970s has resulted in the attrition of such previously widely spoken languages as Hokkien, Cantonese and Teo Chew, while in the Indian and Malay communities the increasing use of English within the family has also continued to displace the use of traditional mother tongues (Department of Statistics 2016; ELIS 2016, 29–33). Given that, in 2015, an estimated 74.3% of the population were ethnically Chinese, 13.3% were Malay and Indians were 9.1%, it seems clear, that in terms of numerical dominance not least, English and Mandarin function as the two major languages of Singapore society, despite the somewhat anomalous retention of Malay as the national language (Bolton and Ng 2014).

While there exists a large body of research on the wider sociolinguistics of Singapore society, surprisingly few studies have previously been carried out on language use in higher education. The literature that does exist has largely discussed the broad strokes of language policy at tertiary level, as well as throughout the other strata of public education. Chew (2014), for example, discusses how English ‘has contributed to the making of modern Singapore’, arguing that the preference for English in education contributed to the rapid development of Singapore as an international financial and technological hub (28–31). Choo’s (2014) analysis of national education syllabuses indicates how English education has valorised the Singapore government’s strategic cosmopolitanism, which has been promoted through ‘governmental strategies of differentiation and prioritization’ (677). In similar vein, Teo (2007) suggests that the pressures of globalisation and international competition have shaped the discursive practices of Singapore’s universities, which have emphasised such societal aspirations as being internationally competitive, and globally oriented. As interesting and thought-provoking as studies such as these are, it is somewhat remarkable that very little original empirical research on the language habits and use of Singapore university students has previously been carried out. One notable exception here, however, has been a recent study by Siemund, Schulz, and Schweinberger (2014) on the ‘linguistic ecology’ of college and university students. As the authors of this study pointedly note, the multilingual background in Singapore is highly complex:

In attempting to get to grips with multilingualism in Singapore in general, and the sociolinguistic realities of the use of languages in Singapore universities and polytechnics, Siemund, Schulz, and Schweinberger (2014) investigated the language use, language background and language preferences of some 300 students. The major thrust of this study, however, was not to investigate the language use or language needs of students within the domain of tertiary education, but rather, to investigate the extent to which such students are ‘bilingual’ or ‘trilingual’ in the languages of the community. In this context, the researchers argued that, typically, university students were ‘more often bilingual’ than students from polytechnics, who, they claim, are ‘mostly trilingual’.

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University students are significantly more often bilingual than polytechnic students, who are mostly trilingual. [...] Bilingual university students are typically proficient in English and Mandarin Chinese only, while trilingual polytechnic students are typically proficient in English, Mandarin Chinese, and either Hokkien or Cantonese. Even though the differences between university and polytechnic students may appear surprising, they make sense in so far as governmental language policy campaigns (Speak Mandarin Campaign, Speak Good English Movement) can be expected to induce stronger effects in speakers of higher social status groups, as these tend to be more norm-conforming. (Siemund, Schulz, and Schweinberger 2014, 358)

Whether the perceived differences in degrees of multilingualism between university and polytechnic students will be supported by further research on this topic remains to be seen, but the study by Siemund and his colleagues has nevertheless raised a number of interesting issues concerning patterns of language acquisition and use among young people in Singapore society. The study did not, however, focus on the language use of students within the university domain, which was the main focus of study for the current research project on language use in the University presented later in this article.

Other literature that proved relevant to the current study included a number of international studies concerning the experiences and language difficulties of postgraduate students at leading international universities, including US graduate schools, which have recruited large numbers of research students from mainland China (UNESCO 2016; Xiang 2016). The relevance of such research to the Singapore context is simple and direct. At the University where this current study was carried out, only a small minority of undergraduate students are recruited from overseas (approx. 17%). At the postgraduate level, however, a clear majority of students (approx. 65%) currently come from overseas, while Singapore citizens (c. 24%) and Singapore Permanent Residents (PRs) (c. 11%) provide somewhat smaller totals (2014–2015 totals). Of the overseas postgraduate students who responded to the survey discussed below, the two largest groups were from mainland China (45.9% of postgraduate students) and India (16.1% of postgraduate students in our sample).

The trend of recruiting PhD students from China, India and elsewhere is not peculiar to Singapore or other Asian institutions, but is even more dramatically evidenced in the research laboratories of North American and European universities, where, in recent decades, growing numbers of students from mainland China in particular have embarked on PhD studies, very often with particular reference to STEM (Science, Technology, Engineering and Mathematics) subjects. An emblematic example of this development has been the experience of many US universities, which are typically the first choice for students from China. Xiang’s (2016) study reports that, in recent years, approximately half the Chinese students going to the US to study were enrolling at graduate school level, with a total of 88,477 Chinese graduate students at US institutions in the academic year 2011–2012. In addition, it was noted that, in 2013, Chinese students gained 4789 PhD degrees, with 93% of these in STEM areas, compared with 2205 PhD for Indian students, and 1229 for students from South Korea. Further afield, in the OECD countries, a similar pattern has played out with high proportions of international students enrolling for Master’s and PhD programmes within the UK, Europe, Australia and New Zealand. In 2013, 40% or more of PhD graduates from the UK, Belgium, Netherlands, Switzerland and New Zealand were international students, compared with 36% of PhDs from Australia. In fact, the seven OECD countries, Australia, Canada, France, Germany, Japan, the UK and the US together attract more than 50% of all international students worldwide, with large numbers of these opting for graduate studies (OECD 2016). In the case of the US, the influential US journal Foreign Policy recently noted that there were now ‘more Chinese students are studying in the U.S. than ever before’, and went on to explain that:

Chinese students are by far the most visible international presence at many universities across the United States, and their numbers continue to grow. This year, during the 2014–2015 academic year, the number of Chinese students studying stateside was 304,040, a 10.8 percent increase over the 2013–2014 academic year. [...] Out of the more than 974,000 international students currently in the United States, almost one in three is now Chinese. (Allen-Ebrahimian 2015)
The same report also went on to note that 39.6% of Chinese students in the US were enrolled at graduate level. Similarly, in the UK, there have also been reports that in recent years there have been ‘almost as many Chinese students on postgraduate courses at English universities as British students’ (Gye 2014).

The trend of Chinese students opting for overseas studies has not been confined to North America and Europe, but has also been played out in other parts of the world. Within the Asian region, a useful context for comparison with Singapore is perhaps provided by Hong Kong’s universities, where the overwhelming majority of international postgraduate research students over the past decade have been recruited from mainland China. The available statistics for Hong Kong universities reveal that, in the academic year 2015/2016, there were a total of 5931 research postgraduates at all government-funded Hong Kong universities, and of these, 4909 were recruited from mainland China, which accounted for some 82% of postgraduate students in the territory (Hong Kong 2016). In recent years, many of the mainland students have reported difficulties in adjusting to English-medium education in Hong Kong. One recent study quoted various students from China commenting that ‘my oral English was not sufficient’; ‘the biggest challenges are speaking and writing’; ‘it was rather difficult to switch from all-Chinese to all-English’ (Cheung 2013, 230–231).

With reference to the present study, the survey research we report on here sought to answer four inter-related research questions concerning EMI in the University. These were: (i) What specific difficulties in academic communication are experienced by students at the University? (ii) How do the communicative difficulties of undergraduates and postgraduates compare? (iii) In which areas of academic communication are improvements most needed? And (iv) to what extent are official policies mandating the use of English as the sole medium of instruction within the University reflected in the practices of faculty and students within the institution? The educational justification for this research was that no previous study of language use and language needs within the University had been carried out before this current project was initiated. The sociolinguistic justification for our study ran parallel to this, as our driving curiosity as researchers was also to investigate somewhat finer-grained patterns of language contact and multilingualism within the institution.

**Methodology**

**Background to the survey and data collection**

The methodology adopted in this research utilised two online surveys, one aimed at undergraduate and postgraduate students of the University, and the other aimed at academic faculty. The questionnaire for the survey (which was written in English) was posted online, on a designated website, and then information was sent to all students and all faculty at the University inviting them to participate, and offering an incentive for their participation in the survey. The questionnaire was highly detailed, comprising 114 questions, with sub-sections dealing with the personal characteristics of students, their linguistic and educational backgrounds, their reading practices, their writing skills, spoken communication, language mixing, presentation skills, online learning, self-assessment of language skills and perceived areas of difficulty. The questionnaire that was used in the survey was one that had been developed over a number of years by the research team, versions of which had been previously used at The University of Hong Kong (Bacon-Shone, Bolton, and Nunan 1996; Bolton and Kuteeva 2012; Botha 2013, 2014; Bolton and Botha 2015). The online surveys for students and faculty were carried out between 15 October 2014 and 7 December 2014 using the Qualtrics program, after which the data were then checked for consistency, and the results were then collated and organised in the form of tables. The student survey was very successful in attracting a high level of response from students, with some 8280 completed questionnaires, a number that represented 28.2% of the student population. Of these students, 7575 were undergraduates and 705 were postgraduate students. In addition, a total of 222 faculty/staff (out of 1122) responded to the faculty/staff survey, which represented approximately 19.8% of teaching staff.
Both the undergraduate and postgraduate students were distributed across the four major Colleges of the University, Engineering, Science, Business, and Humanities, Arts and Social Sciences. At the undergraduate level, it was found that Engineering students were substantially over-represented in the survey, and consequently it was decided to weight the undergraduate survey results by College to match those of the general University population, and those results presented below reflect this weighting. As our analysis of the results proceeded, it also became clear that disciplinary affiliation (as indicated by ‘College’) was an obvious and major variable, with many of the results indicating varying levels of communication difficulties according to College of study, as well as according to level of education.

Another very important variable influencing results at both the undergraduate and postgraduate levels was that of the nationality of the students, a social factor that we attempted to measure through both indirect and direct questioning. For example, at a more indirect level, it was relevant to ask undergraduate and postgraduate students about their residence status in Singapore, as illustrated by Tables 1 and 2.

As can be seen from Table 1, the overwhelming majority of undergraduate students at the University are either Singapore citizens (77.7%) or Singapore PRs (‘PRs’ who account for 5.6%). Only a minority of undergraduate students (16.6%) are ‘foreign’ students from overseas, with many from such countries mainland China, India, Indonesia and Malaysia. Table 2 sets out a similar set of figures for postgraduate students.

At the postgraduate level, it is clear that substantial majority of postgraduates (65.3%) come from overseas, with Singapore citizens (23.8%) and Singapore PRs (10.9%) accounting for much smaller totals. The survey also included questions on the nationality of postgraduate students in the sample, and Table 3 sets out the results for the sample, although figures for the University as a whole were not available.

What is immediately noticeable from Table 3 is the relatively high total for postgraduate students from mainland China (43.3%), followed by those from India (15.2%), Singapore citizens (14.9%), Singaporean PRs (4.9%), Indonesians (3.0%) and Malaysians (1.9%). As a result of these and other factors, a large number of postgraduate students, whose publications also contribute to the research outputs of the University’s laboratories, are recruited from overseas, not least from mainland China and India, as indicated above.

Results

In this section of the article, we report on a selection of survey results related to the research questions outlined above, which focus on the reported difficulties of students at the University; the different experiences and difficulties of undergraduate versus postgraduate students; areas in greatest need of improvement; and the extent to which official policies are effectively implemented in undergraduate and postgraduate education.

**Issue 1: areas of perceived difficulty in academic communication**

With reference to the first research issue concerning the communication difficulties of undergraduate and postgraduate students, one useful starting point here was the question which asked students

| Table 1. University undergraduate students and survey sample by residence status. |
|----------------------------------|---|---|
| Residence status                | University | Sample |
| Singapore citizen               | 77.7% | 71.5% |
| Singapore PR                    | 5.6% | 4.9% |
| Non-Singapore citizen and non-PR| 16.6% | 21.0% |
| Missing                          | –    | 2.7% |
| **N = 23,155**                  |      |      |
| **N = 7717**                    |      |      |
to rate their own proficiency in the major languages of the community, as well as other languages. As can be seen from Figure 1, the majority of undergraduate students indicated that they felt most proficient in English, compared to a majority of postgraduate students who claimed greatest proficiency in Mandarin Chinese. More specifically, 59% of undergraduates stated that they were most proficient in English, while only 29% of postgraduate students stated that they were most proficient in English. Interestingly, just over 40% of postgraduate students reported that they were most proficient in Mandarin Chinese, compared with 31% of undergraduate students.

**Reported difficulties of undergraduate students**

A number of questions in the survey asked students about their perceived difficulties in various aspects of academic communication, including receptive and productive skills. At both the undergraduate level and the postgraduate level, a major independent variable influencing the type of difficulty reported was the disciplinary background of students, as evidenced by their College affiliation. The results presented for undergraduates below are based on the responses to questions that asked them ‘How able are you to do the following’, with individual questions on the four basic language skills. The responses to these questions were placed on a scale that included ‘Unable’, ‘A lot of difficulty’, ‘Some difficulty’, ‘Very little difficulty’ and ‘No difficulty’. The percentages set out in Figure 2 are cumulative figures derived from adding the totals for ‘Unable’, ‘A lot of difficulty’ and ‘Some difficulty’. Figure 2 also shows that there were consistently higher levels of difficulty reported by Engineering and Science undergraduate students, as compared with students from the College of Business and from Humanities and Social Sciences.

A broadly similar pattern was also discernible at the postgraduate level, where it was noticeable that postgraduate students typically reported greater levels of difficulty than undergraduate students for various English skills, as may be seen from Figure 3. For instance, 33% of Science postgraduates expressed difficulty in ‘speaking English’ compared with 15% of undergraduate Science students.

In terms of reading, students were also asked to report text types they found to be the most difficult. The results indicate that undergraduate students in the survey reported greatest difficulty in reading ‘academic articles’ and ‘research articles’, with more than 33% of undergraduates reporting having difficulty in reading such texts. It is also interesting to note that 12.1% of undergraduate students reported reading academic materials in languages other than English. Postgraduate students in the survey also reported the greatest difficulty in reading ‘academic articles’ and ‘research articles’, with 32.2% of students reporting having difficulty in reading such texts, and 21% of postgraduate students reported reading academic materials in languages other than English.

### Table 2. University postgraduate students and survey sample by residence status.

<table>
<thead>
<tr>
<th>Residence status</th>
<th>University</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore citizen</td>
<td>23.8%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Singapore PR</td>
<td>10.9%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Non-Singapore citizen and non-PR</td>
<td>65.3%</td>
<td>74.3%</td>
</tr>
<tr>
<td>Missing</td>
<td>–</td>
<td>6.7%</td>
</tr>
<tr>
<td>N = 6164</td>
<td>N = 705</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3. University postgraduate students by nationality in the survey sample.

<table>
<thead>
<tr>
<th>Nationality/residence</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainland Chinese</td>
<td>43.3%</td>
</tr>
<tr>
<td>Indian</td>
<td>15.2%</td>
</tr>
<tr>
<td>Singaporean</td>
<td>14.9%</td>
</tr>
<tr>
<td>Singaporean PR</td>
<td>4.9%</td>
</tr>
<tr>
<td>Indonesian</td>
<td>3.0%</td>
</tr>
<tr>
<td>Malaysian</td>
<td>1.9%</td>
</tr>
<tr>
<td>Other</td>
<td>16.8%</td>
</tr>
</tbody>
</table>
In terms of students’ perceived difficulty in writing, the results indicate a range of difficulties varying according to particular writing tasks. Undergraduate students reported the greatest level of difficulty writing ‘academic essays’, with over 38% of undergraduates reporting difficulty in essay writing, while other writing tasks considered difficult included research essays, longer reports, cover letters, applications for scholarship and critiques. In somewhat parallel fashion, around 35% of postgraduate students also indicated that their greatest difficulty was in writing academic essays, although they also noted the challenges of writing theses/dissertations, research essays/papers/reports and research proposals. At a micro-level of analysis, a sizeable number of undergraduate and postgraduate students expressed difficulty in constructing appropriate arguments relevant to their writing tasks or when explaining concepts accurately. Although both undergraduate and postgraduate students expressed difficulties in writing, students from all the Colleges (that is, Engineering, Science, Humanities and Business) at the postgraduate level expressed greater levels of difficulty in their writing compared with undergraduates. The differences are especially notable between the undergraduate and postgraduate Engineering and Science students. A similar trend, however, is observed in both undergraduate and postgraduate samples where Engineering and Science students expressed the greatest levels of difficulty compared with Humanities and Business students.

**Figure 1.** Most proficient language.

**Figure 2.** Reported difficulty for undergraduate students by skill and College.
Issue 2: the comparison of undergraduate and postgraduate communication difficulties

One key and very basic question in the survey, asked students to report the language in which they considered themselves ‘most proficient’. A clear majority of undergraduates, 58.9%, stated that their most proficient language was English, compared with 30.7% of undergraduates indicating that Mandarin Chinese (or Putonghua) was their strongest language. In contrast, a majority of postgraduates, 41.6%, indicated that Mandarin/Putonghua was their most proficient language compared with 28.5% indicating English, and 16.6% ‘Others’. Given these differences, it is perhaps unsurprising that postgraduate students reported a greater number of difficulties in using English at university compared with undergraduate students. This is also highlighted in the reports of teaching faculty who indicated that the writing abilities of undergraduate students were perceived as clearly better than those of postgraduates, with 85% of faculty rating undergraduate students writing abilities as either ‘Good’ or ‘Acceptable’, compared with 68% for postgraduate students. Figure 4 shows how teaching staff commented on the spoken English abilities of their students. The reports for speaking abilities indicate that 61% of teaching staff in the sample reported that undergraduate students’ spoken English
abilities were ‘Good’, compared to 42% for postgraduates. Results presented in Figure 5 indicate how faculty rated the written abilities of students. From these results it can be seen that 37% of faculty indicated that the written abilities of undergraduates were ‘Good’, compared with 29% for postgraduates. More importantly, some 30% of faculty indicated that postgraduate students’ writing was ‘Poor’, compared with 14% of undergraduates.

What was further interesting here was that, when we compare the reports of faculty with those of students, there is an evident measure of agreement, with postgraduate students typically self-reporting lower levels of proficiency in English for particular purposes, as well as greater levels of difficulty in dealing with various types of academic communication. At a micro-level of analysis, it was found that undergraduate students typically reported little difficulty in understanding, speaking and reading English (Figure 2), while postgraduate students expressed considerable difficulty in writing and speaking English (Figure 3). Postgraduate students also expressed difficulties in understanding English, although one area where postgraduate students expressed fewer difficulties was in reading English, with figures comparable to those of undergraduate students. For example, 21% of Engineering and 12% of Science postgraduates expressed difficulties in reading English, compared to 16% and 10% of Engineering and Science undergraduate students (Figures 2 and 3).

One major explanation for the differences between undergraduate and postgraduate students again relates to the provenance of these two groups of students. As was shown in Table 1, only some 16% of undergraduate students were reported to be non-Singaporean citizens (and non-PRs), compared with just over 65% of postgraduate students who were non-Singaporean citizens or non-PRs. In other words, there are very few ‘foreign’ students at the undergraduate level, compared with a substantial majority of international students at the postgraduate level. In Table 3, it is reported that 43% of postgraduate students in the survey were from mainland China, where exposure to English varies greatly between universities. In addition, around 60% of undergraduate students rated English as their most proficient language, compared to only 28% of students in the postgraduate sample. One inference here is that the two groups of students (undergraduates versus postgraduates) constitute two rather different student populations with a much more heterogeneous range of linguistic backgrounds, proficiencies and profiles.

**Issue 3: areas of academic communication requiring improvement**

There are a number of areas which this study has identified where students report that their communication abilities would benefit from improvement. One area that applies to both undergraduate and postgraduate populations in this study is that of academic writing, in particular with
constructing appropriate arguments or when explaining concepts clearly in written English. Figure 6 shows the perceived difficulties in undergraduate student writing. From the results presented in this figure, some 26% of students expressed difficulties in ‘Constructing appropriate arguments’, and some 23% respectively expressing difficulties in ‘Explaining concepts’ and ‘Citing information’. It needs to be noted that some 14% of students reported ‘no difficulty’ at all in applying specific writing skills.

Figure 7 shows the results for perceived difficulties in postgraduate student writing, where respondents indicated which areas of written expression caused them most difficulty. A sizeable number of students expressed difficulty in constructing appropriate arguments, explaining concepts, summarising and paraphrasing information, developing hypotheses, as well as a number of other skills, while 11% of postgraduate students reported ‘no difficulty’ whatsoever in academic writing tasks.

Undergraduates also stated that there were specific areas for improvement with reference to English language skills, with 36.3% of students stating that they needed ‘Very much’, ‘A lot’ or ‘Quite a lot’ of support in order to improve their communication skills. The results of other questions indicated that the undergraduates considered writing (English language) essays and reports as a highly difficult task, with 24.5% of undergraduates indicating ‘Some difficulty’ or ‘A lot of difficulty’ in this context. However, whatever the difficulties of undergraduate students in academic communication, it is clear from the results that the reported levels of difficulty of postgraduate students consistently dwarf those of undergrads, as clearly shown in Figure 8. What is also quite clear from this figure is that postgraduate students also experience the greatest difficulties in academic writing, but also have major difficulties in speaking and listening, with lower-level difficulties in reading tasks.

In comparison, a large number of postgraduate students also stated that there was room for improvement of English language skills, with some 59.6% of postgraduate students reporting that they needed ‘Very much’, ‘A lot’ or ‘Quite a lot’ of improvement in their communication abilities. Some 10% of these students also rated themselves either ‘Poorly’ or ‘Very poorly’, in the context of their needs at the University, with 15.9% of students from mainland China reporting that their English proficiency in the context of their studies at the University was ‘Poor’ or ‘Very poor’. One issue that again seems very clear here is that the difficulties of postgraduate students, particularly those from overseas, are of a much greater order than those of undergraduates. As noted above, the survey results provide clear evidence that a sizeable number of postgraduate students have substantial difficulty in studying through the medium of English, especially with reference to the productive skills of writing and speaking English in the context of their university studies.

![Figure 6. Perceived difficulty of writing skills (undergraduate students).](image-url)
Issue 4: language policy and the realities of language use at Singapore universities

As noted in the introduction, the government of Singapore has promoted and enforced the use of English as the sole official medium of instruction at all levels of education in Singapore since the mid-1980s. In contemporary Singapore, the English language is the sole or predominant teaching medium at all levels of education, including higher education and the University where this study was carried out. At the level of formal instruction, there is every indication that EMI education in this context is working remarkably well, and the results from the survey indicate that English is overwhelmingly used as the medium of instruction at all levels of formal teaching, including lectures, seminars and laboratory sessions. As shown in Table 4, 95.5% of the undergraduate students reported that ‘All’ or ‘Almost all’ of lectures were conducted entirely in English, compared with 96.5% for tutorials or seminars, and 83.5% for laboratory sessions or workshops. One major reason why these totals do not reach 100% is the fact that a number of courses, for instance in the Chinese division, the Traditional Chinese Medicine Programme, and Centre for Modern Languages, are taught in languages other than English.
With reference to postgraduate education the results presented in Table 5 again indicate that English is overwhelmingly used as the medium of instruction at all levels of teaching, with 93.9% of the students reporting that ‘All’ or ‘Almost all’ of lectures were conducted entirely in English, compared with 89.3% for tutorials or seminars, and 79.4% for laboratory sessions or workshops.

However, a number of results from the survey also reflect the complex multilingual backgrounds of students attending the University. At one end of the continuum, there is a large body of local Singaporean undergraduate students who are highly proficient in using English and who have sufficient experience in learning through the medium of English, and who are relatively well prepared, academically and linguistically, before entering higher education. For these students, the greatest challenges they face are typically in improving their written language proficiency, in response to the specific needs of their studies. Many of the Singaporean undergraduate students compare very well in their communication abilities with students from such ‘Inner Circle’ English-using universities as the UK and US. This was highlighted in the comment from one teacher that ‘some students are excellent writers and communicators’ (Assistant Professor, School of Humanities and Social Sciences), while another pointed out that ‘writing well is a lifelong undertaking’ and that ‘even native speakers can use help’ (Associate Professor, School of Communication).

At the other end of the continuum, however, we find a sizeable number of foreign postgraduate students, who are evidently facing considerable difficulties in dealing with the EMI-based curriculum of the University. One very revealing finding of the postgraduate survey was that a total of 18.9% of these students stated that they used Mandarin/Putonghua in order to discuss academic matters with their classmates in the classroom, with another 18.9% reporting the use of Mandarin/Putonghua as the main medium of communication with their supervisors (and another 10.6% stating that they used a ‘mixed’ language for this purpose). Some 21% of postgraduate students also reported using another language other than English when reading their academic materials, which suggests that reading academic materials in their ‘native’ language might be a coping mechanism for such students. From a sociolinguistic perspective, this cluster of results suggests that, in reality, Chinese is also used as an additional (albeit covert) medium of communication at the University, at least by sub-sections of students and faculty at the level of postgraduate education.

The problems of postgraduates were also foregrounded in a number of responses from teaching faculty, with one professor of Engineering commenting that:

> Many of our postgraduates are from countries where English is not the main teaching medium, and their poor ability in English shows. I don’t think we offer enough training for them in the fundamentals of the language, in writing and speaking in particular. […] I have examined PhD theses which are badly written; in some cases, the bad writing practically obliterated the good quality technical work. (Associate Professor, College of Engineering)

Another commentator amplified this judgement in even less equivocal terms, asserting that:

Table 5. Use of English as a medium of instruction at the university (postgraduates).

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Almost all</th>
<th>About half</th>
<th>Very few</th>
<th>None</th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>86.6%</td>
<td>7.3%</td>
<td>2.3%</td>
<td>2.0%</td>
<td>1.1%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Tutorials/seminars</td>
<td>80.8%</td>
<td>8.5%</td>
<td>2.8%</td>
<td>2.8%</td>
<td>1.4%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Laboratory sessions/workshops</td>
<td>69.4%</td>
<td>10.0%</td>
<td>5.3%</td>
<td>2.8%</td>
<td>2.3%</td>
<td>10.2%</td>
</tr>
</tbody>
</table>
The standard of written and spoken English is appalling […] among our graduate/research students […] I have been on PhD oral defence committees and have had a hard time comprehending what the candidate was trying to convey, let alone the merits of the work presented. (Associate Professor, College of Engineering)

With reference to the University’s official policy of using English as the sole language of learning and teaching, the reality is that the EMI policy has been broadly implemented with considerable success at the University, but it appears evident from our research that the implementation of this policy has not been uniformly successful across all groups of students at the University, and that sizeable numbers of overseas postgraduate students in particular may need much greater support in dealing with the University’s EMI system than has been offered to them in the past.

**Limitations of the study**

At this point, some mention of the limitations of this study might be appropriate, as, given the approach and methodology, there were a number of constraints on the research project. First, as is clear from our description above, for this research we adopted a quantitative survey methodology, which provided only a limited scope for open-ended qualitative comments from our respondents, at the level of both students and faculty. The major limitations of our findings, therefore, are derived directly from our choice of methodology, which by definition relies largely on the self-report of respondents. A second limitation, in the context of Singapore, is that the study reported on here was carried out at only one of Singapore’s six universities, and that a more comprehensive picture of language use in higher education would necessitate extensive research at the other five institutions within the city-state. Nevertheless, despite such limitations, we would also argue that this research has covered new ground, given that, to our knowledge, no other comparable survey within Singapore higher education has been completed earlier. In addition, we would also argue that a number of key results relating to the academic literacy of postgraduate students are – as indicated in the discussion of these findings – of direct relevance to the sociolinguistics of higher education in the Asian region and internationally.

**Commentary and conclusion**

The research reported on here set out to investigate four key issues in relation to English-medium education at the Singapore University where this research was conducted. One broad aim of the survey was to investigate the extent to which official language policies were matched by actual practice within the institution, whereas the other research questions related more to the specific needs and difficulties of students with reference to specific aspects of academic literacy.

With reference to the broad issue of policy and practice, the results of our research generally indicated that there was overwhelming compliance with the official EMI policy of the university at both undergraduate and postgraduate levels, and that the standards of associated pedagogy were very high indeed. However, a detailed examination of the data also suggested that there was substantially greater linguistic conformity at the undergraduate rather than at postgraduate level, where, as noted above, a good deal of communication between thesis supervisors and students evidently takes place in Chinese as well as English. This finding was also corroborated by other results relating to the differences between undergraduates and postgraduates, which have been discussed at length above. As noted earlier, many of these differences may be explained by the rather different prove-nances of these two groups of students, with a total of 16.6% of foreign students at the undergraduate level, compared with 65.3% of non-Singaporean students at postgraduate level. Linguistically, the difference between these two groups of students is also profound, with a majority (59%) of undergraduates claiming that their strongest language is English, compared with a majority of postgraduates (42%) claiming that their strongest language is Mandarin.

With reference to the specific question of language difficulties, it was noted that generally the greatest levels of difficulty of both undergraduate and postgraduate students related to the productive
skills of speaking and writing academic English, although self-reported proficiencies varied greatly according to discipline and College of study, as discussed at length above. With reference to the third research question of particular areas of academic communication where improvements and interventions might be needed, the results of the survey clearly indicated that there were many more problems reported at postgraduate level than at undergraduate level, with a total of 32% of the University faculty describing the written ability of postgraduate students as either ‘Poor’ or ‘Very poor’ (compared with just 13.8% for undergraduate students). One obvious challenge for the University here is the provision of appropriate and relevant programmes for postgraduate students on such topics as research writing and thesis writing.6

In addition, however, the researchers in this project also found it noteworthy that many of the problems concerning postgraduate communication were related to the recruitment of non-Singaporean graduate students, including substantial numbers of students from mainland China. In this context, we would argue, that our results concerning the communication problems of foreign graduate students at the University in Singapore connect this study to the frontline of global, or at least globalising, education. Over the last 15 years in particular, one obvious trend at leading research universities internationally has been to recruit substantial numbers of postgraduates from mainland China, whose presence has yielded a range of benefits, including increased research outputs, but has also raised key questions concerning their communication skills, as well as the need for universities to provide appropriate learning/teaching programmes in order to enhance the academic literacy of these students.

Despite this, as researchers, our own interest in the realities of language use within the University was driven more by sociolinguistic curiosity rather than a prescriptivist desire to enforce monolingual language management within the institution. Indeed, given the celebrated multilingualism of Singapore society, it is to be expected that fine-grained and nuanced patterns of language contact and use are visible throughout many of the nation’s public institutions, despite the constraints of official language policies. In addition, the wider issue of large numbers of students from mainland China pursuing graduate studies abroad appears to us a trend of almost macro-sociolinguistic magnitude given the large numbers of students following this trajectory. The reasons for this trend are many, and include such factors as the reputations of international universities, students’ desire to study abroad, as well as the perceived benefits of an international education, which can all be seen as ‘push’ factors propelling students to go overseas. There are also a number of ‘pull’ factors at work too, as many overseas universities are eager to recruit some of the brightest and best Chinese students into their research laboratories overseas. Perhaps the most obvious beneficiary of Chinese academic talent have been leading US research universities. A 2013 study by Gaulé and Piacentini reported that:

Immigrants from China are a large fraction of Science and Engineering PhD graduates educated in the United States. Of around 30,000 PhD students graduating in 2006, more than 4300 (14.3%) were Chinese citizens […] Our results suggest that the immigration of Chinese students substantially expands the pool of talent available to the American scientific research enterprise. […] Chinese students have a scientific output during their thesis that is significantly higher than other students. (2013, 698)

The same study went on to note that, compared with other students, Chinese graduate students generally gave an ‘excellent performance’ in producing research publications during the period of their PhD studies, although the researchers also warned that the ‘negative effects’ of such recruitment might de-incentivise ‘native’ US students from engaging in scientific careers. Given the appeal of Chinese graduate students to US institutions, it is not unreasonable to infer that a similar motivation applies to the recruitment of such students in Hong Kong and Singaporean universities. The leading universities in both Hong Kong and Singapore have been competing determinedly in the international rankings in recent years, not least with reference to STEM subject research, which often relies on laboratory output from PhD students engaged in team-based research projects. However, in the US and UK contexts, it has also been noted that many Chinese graduate students often face
substantial communication difficulties in using English in the university studies (Edwards, Ran, and Li 2007; Kuo 2011). Within contexts such as Hong Kong and Singapore, moreover, there is also the likelihood that Mandarin (or ‘Putonghua’) may be used alongside English, both with teachers and with fellow students, as an additional language in contexts where ethnic Chinese researchers and students work side by side.

Indeed, the wider story here relates not simply to the language of academic research and learning, but also to the emergence of China as ‘a major contributor to science and technology’ over the last 17 years in particular. Since 1999, China has seen a massive expansion of higher education, and is now a world leader in the conferment of Bachelor’s degrees, and has even overtaken the US in the conferment of Doctoral degrees in recent years (Xie, Zhang, and Lai 2014, 9438). China’s increasing competitiveness on the world academic stage has also led to the increasing visibility of its research publications, which are now overwhelmingly published in the English language. Its impact in such activity has been nothing less than dramatic, and China now ranks second in the world for science and engineering research publications:

China is by far the fastest-growing country in terms of article productivity between 1990 and 2011. Growing at an annual rate of 15.4%, China’s total number of S/E articles increased 20 times, from 6104 in 1990 to 122,672 in 2011. In comparison with other countries, China overtook the United Kingdom in 2004, and Japan and Germany in 2005, and has since remained second only to the United States. By 2011, China’s article output was two-thirds that of the United States, and more than half of the total production by all EU-15 countries combined. (Xie, Zhang, and Lai 2014, 9440)

In the last two decades, China’s research capabilities in science and technology have increased exponentially, as have the achievements and ambitions of its students, which are now felt on a global scale in almost all major universities in the world. In this context, for a swathe of reasons, the dominance of English as scientific language is likely to remain unchallenged for the foreseeable future, but one important challenge for many international universities is to recognise the heterogeneous linguistic abilities and backgrounds of students at all levels of higher education, and to accommodate to new patterns of linguistic contact and diversity appropriately and intelligently.

Notes

1. Singapore’s investment in higher education and scientific and technological development has been cited as one major reason for the city-state’s impressive economic success. Singapore’s GDP per capita in 2014 was an astonishing US$83,100. The comparable figure for the US is $54,400, with $46,600 for Australia, and $39,800 for the UK (World Factbook 2015).

2. In addition to Singapore’s six universities, the Ministry of Education’s Higher Education Division (or HED) also oversees nine other institutions, including five Polytechnics, the Institute of Technical Education (ITE), the Science Centre Singapore (SCS), the Institute of Southeast Asian Studies (ISEAS) and the Council for Private Education (CPE) (MOE 2015).

3. The 2010 census also reported on the resident student non-student population by ethnic group and highest qualification obtained, where it is interesting to note that, at that time, 22.6% of Chinese, 35% of Indians and only 5.1% of Malays had obtained a university-level qualification.

4. It is unclear from official websites and other sources exactly how many foreign universities are operating in Singapore. Various listings are posted on websites such as the following: Internations (2015), Universities in Singapore (2015), Digital Senior (2015), but one problem here is that such listings seem to conflate both private Singaporean universities and branch universities of overseas institutions, a situation further complicated by multiple collaborations between local educational players with overseas providers. In addition, there are also multinational educational entrepreneurs such as Kaplan operating locally and providing a platform for degree courses from such Australian universities as Murdoch and RMIT, and UK institutions such as Essex, Northumbria and Portsmouth. The official government list of private colleges and universities lists a few hundred such organisations, but many of these appear to be lower-level vocational institutes, and little hard information about the enrolment and operation of these institutions is provided on this website (Council for Private Education 2015).

5. These results point to a key characteristic of the postgraduate population at the University, relating to the dominance of overseas students in taking up research postgraduate places, and a distinct lack of demand from Singapore students for places in postgraduate education, including PhD programmes. This trend has been
explained with reference to the preference of the brightest local students for postgraduate studies at elite institutions overseas, and the desire of local students to enter the workplace after long years in the public education system, with male students also serving up to two years national service in addition (Matthews 2013).

6. Indeed, since the survey results were released at the University, measures have recently been taken to increase the provision of relevant courses in research writing at the postgraduate level, as well as to rethink admissions procedures for entry into postgraduate programmes.

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