

Females Catching Up with Males in Enrolment at Local Tertiary Institutions

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Introduction

For a long time, males have been more likely to attend tertiary educational institutions than females. Has this tendency changed over time in Singapore?

One way of studying the trend is to look at the ratio of females to males who have enrolled in tertiary institutions over the years. This article analyses the gender ratio in local tertiary institutions' enrolment data for polytechnic diplomas and university degrees in 2014, and compares the trends over the last 20 years. Besides the overall level, it also examines the gender distribution among various fields of study.

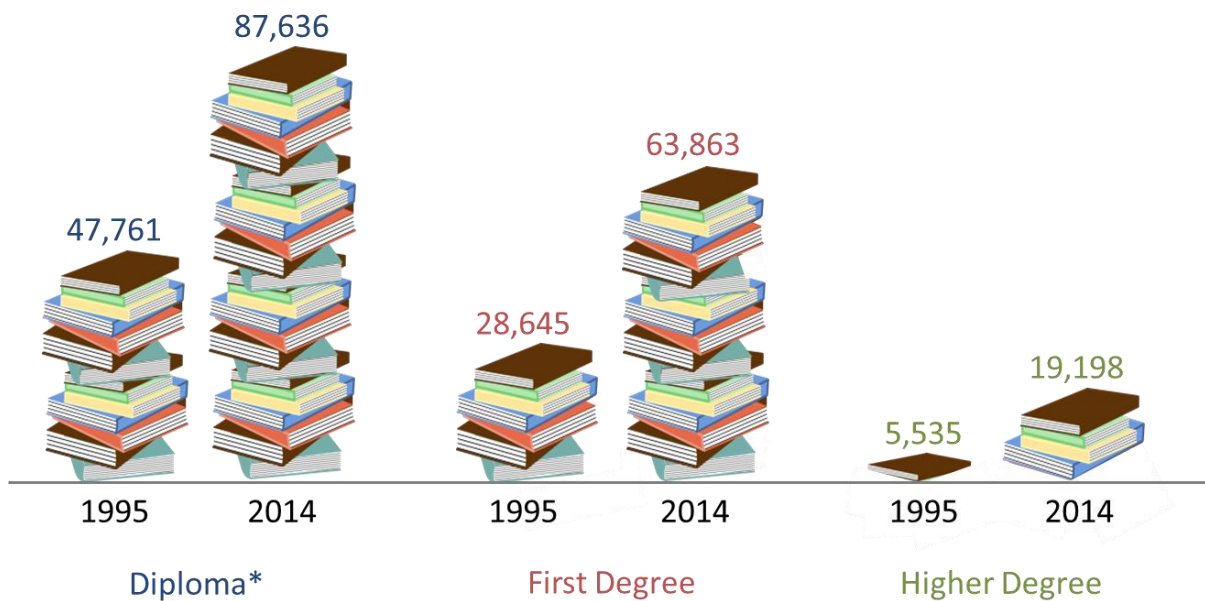
Overall Female-to-Male Enrolment Ratio

Total Enrolment and Female-to-Male Enrolment Ratios Rose in Tandem

Over the last 20 years, the total number of students enrolled in tertiary educational institutions and the female-to-male enrolment ratios rose in tandem.

Overall increases in enrolment were evident at all 3 tertiary levels viz. Diploma¹ from polytechnics, First Degree² as well as Higher Degree³ from universities (Chart 1).

Chart 1 TOTAL ENROLMENT BY EDUCATIONAL LEVEL, 1995 AND 2014



* Includes Polytechnic Advanced Diploma, which made up 3.4% and 3.8% of the total diploma enrolment in 1995 and 2014 respectively.

1 Refers to polytechnic diploma and advanced diploma (including post diploma, management diploma, specialist diploma and postgraduate diploma).
 2 Refers to Bachelor's degree or equivalent.
 3 Refers to postgraduate diploma, Master's degree, Doctorate degree or equivalent.

Female-to-Male Enrolment Ratio was the Highest for First Degree Level

Compared to the other tertiary levels, the gender ratio in enrolment was consistently the highest for the First Degree level which hovered around the 1:1 ratio since 2007 (Chart 2).

As males in Singapore begin university education two years later than their female counterparts due to National Service, the gender ratio in enrolment for the First Degree level was adjusted to account for this.

Throughout the past 20 years, the adjusted⁴ gender ratio, which was lower than the unadjusted gender ratio, remained under the 1:1 ratio. Nonetheless, both the adjusted and unadjusted gender ratios in enrolment for the First Degree level were still higher than the gender ratios in enrolment for the Diploma and Higher Degree levels.

Female Enrolment Caught Up Most Rapidly for Higher Degree Level

Over the past 20 years, the female-to-male enrolment ratio for the Higher Degree level was consistently the lowest among the 3 tertiary educational levels.

However, the ratio went up the fastest at an average rate of 3.5 per cent a year. This ratio in 2014 was 71 females per 100 males, almost doubling the ratio of 37 females per 100 males in 1995.

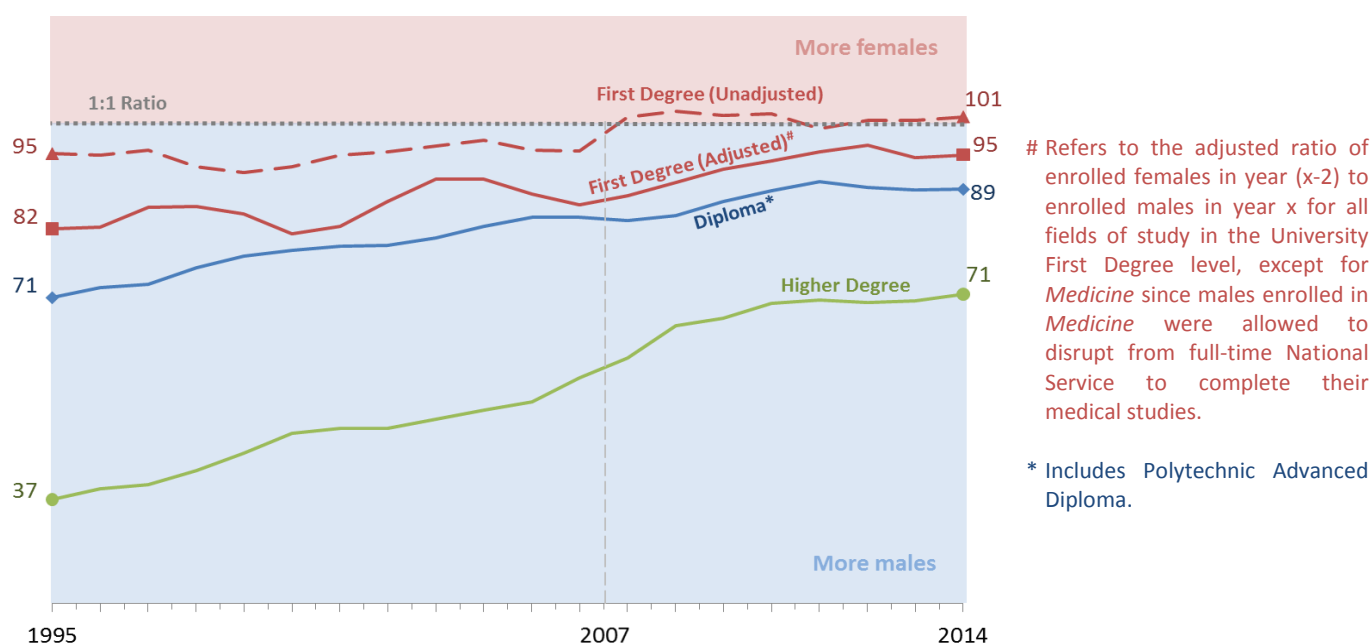
The gender ratio in enrolment for the Diploma level rose at an average rate of 1.2 per cent a year. In 2014, there were 89 females per 100 males enrolled in Diploma courses, up from 71 females per 100 males in 1995.

In contrast, the pace of increase was the slowest for the First Degree level. After adjusting for the delay in university education among males due to National Service, for every 100 males, the number of females enrolled in First Degree courses went up from 82 in 1995 to 95 in 2014. This translates to an average increment rate of 0.8 per cent a year for the adjusted gender ratio.

Female-to-Male Enrolment Ratio by Field of Study

In 2014, the top 5 fields of study for the First and Higher Degree courses in terms of total enrolment were *Engineering Sciences, Business & Administration, Information Technology, Humanities & Social Sciences* and *Natural, Physical, Chemical & Mathematical Sciences* (Table 1).

CHART 2 FEMALE-TO-MALE ENROLMENT RATIOS BY EDUCATIONAL LEVEL, 1995-2014 (FEMALES PER 100 MALES)



4 We adjust the gender enrolment ratio for First Degree in year x to be based on the ratio of enrolled females in year (x-2) to enrolled males in year x for all fields of study, except for *Medicine* since males enrolled in *Medicine* were allowed to disrupt from full-time National Service to complete their medical studies.

Table 1 TOTAL ENROLMENT AND FEMALE-TO-MALE ENROLMENT RATIO
BY FIELD OF STUDY AND EDUCATIONAL LEVEL

Field of Study	Total Enrolment in 2014		Female-to-Male Enrolment Ratio (females per 100 males)	
	Number	Per Cent	1995	2014
University First Degree^(a)				
Engineering Sciences	18,438	28.9	13	40
Humanities & Social Sciences	11,291	17.7	254	180
Business & Administration ¹	10,945	17.1	174	116
Natural, Physical, Chemical & Mathematical Sciences	8,145	12.8	143	142
Information Technology	4,152	6.5	55	43
Health Sciences	3,299	5.2	50	141
Architecture & Building ²	1,990	3.1	122	144
Fine & Applied Arts ³	1,578	2.5	31 ⁸	117
Law	1,514	2.4	123	90
Education	1,103	1.7	240	461
Mass Communication & Information Science Services ⁴	729	1.1	92	284
	679	1.1	72 ⁹	191
University Higher Degree^(b)				
Engineering Sciences	6,059	31.6	16	38
Business & Administration ¹	3,014	15.7	35	61
Natural, Physical, Chemical & Mathematical Sciences	2,317	12.1	56	82
Humanities & Social Sciences	2,133	11.1	138	150
Information Technology	1,626	8.5	48	43
Health Sciences ⁵	1,562	8.1	69	131
Education	1,229	6.4	158	218
Architecture & Building ²	466	2.4	19	93
Mass Communication & Information Science	364	1.9	218	187
Law	275	1.4	55	98
Services	104	0.5	40	24
Fine & Applied Arts	27	0.1	0 ¹⁰	108
Polytechnic Diploma^(c)				
Engineering Sciences	24,764	28.3	34	25
Business & Administration ¹	20,172	23.0	254	162
Information Technology	11,883	13.6	68	58
Health Sciences	8,169	9.3	635	313
Fine & Applied Arts ⁶	6,181	7.1	107	127
Natural, Physical, Chemical & Mathematical Sciences	5,095	5.8	172	164
Services ⁷	2,674	3.1	23	56
Humanities & Social Sciences	2,520	2.9	91 ¹¹	119
Architecture & Building ²	2,401	2.7	89	125
Mass Communication & Information Science	1,932	2.2	189	272
Education	1,310	1.5	2,050 ¹²	856
Law	535	0.6	332	140

Sources: National University of Singapore (NUS), Nanyang Technological University (NTU), Singapore Management University (SMU), National Institute of Education (NIE), Singapore Institute of Technology, Singapore University of Technology and Design (SUTD), SIM University, Singapore Polytechnic, Ngee Ann Polytechnic, Temasek Polytechnic, Nanyang Polytechnic, Republic Polytechnic, Ministry of Education

¹ Includes Accountancy.

² Includes Real Estate.

³ Includes Industrial Design.

⁴ Includes Maritime Studies.

⁵ Includes Medicine, Dentistry, Pharmacy and Nursing.

⁶ Includes Digital Media Design and Production.

⁷ Includes Maritime Transportation, Nautical Studies and Police Studies.

⁸ Ratio is for year 2001.

⁹ Ratio is for year 2006.

¹⁰ Ratio is for year 2005.

¹¹ Ratio is for year 1997.

¹² Ratio is for year 1999.

Notes:

The fields of study are based on the broad groupings of the Singapore Standard Educational Classification (SSEC). Numbers in blue indicate female-dominated courses.

(a) Covers full-time and part-time degree courses. The enrolment ratio refers to the adjusted ratio of enrolled females in year (x-2) to enrolled males in year x for all fields of study in the University First Degree level, except for *Medicine* since males enrolled in *Medicine* were allowed to disrupt from full-time National Service to complete their medical studies.

(b) Covers full-time and part-time postgraduate diploma and higher degree courses offered by NUS, NTU, SMU and SUTD, and higher degree courses offered by NIE.

(c) Covers full-time and part-time polytechnic diploma, post diploma, advanced diploma, management diploma, specialist diploma and postgraduate diploma courses. Those enrolled concurrently in polytechnic diploma / post diploma and advanced diploma (comprising advanced diploma, management diploma, specialist diploma and postgraduate diploma courses) will be counted twice.

Together with the former 3 fields of study, *Health Sciences* and *Applied Arts* made it to the top 5 fields of study for Diploma courses. Specifically, for every 10 students enrolled in each of the tertiary educational levels in 2014, 8 were enrolled in the top 5 fields of study.

Females Were Well-Represented in Many Fields of Study for Diploma and First Degree Levels

While the enrolment of females lagged that of males’ at the overall level, gender distributions differed across fields of study. Out of the 12 fields⁵ in 2014, 9 were dominated by females at the Diploma and First Degree levels, and 5 at the Higher Degree level.

Females Were Under-Represented in Engineering Sciences and Information Technology...

In the top 5 fields of study, males outnumbered females in 2 fields at the Diploma and First Degree levels, and in 4 fields at the Higher Degree level. Across the different educational levels, the 2 main

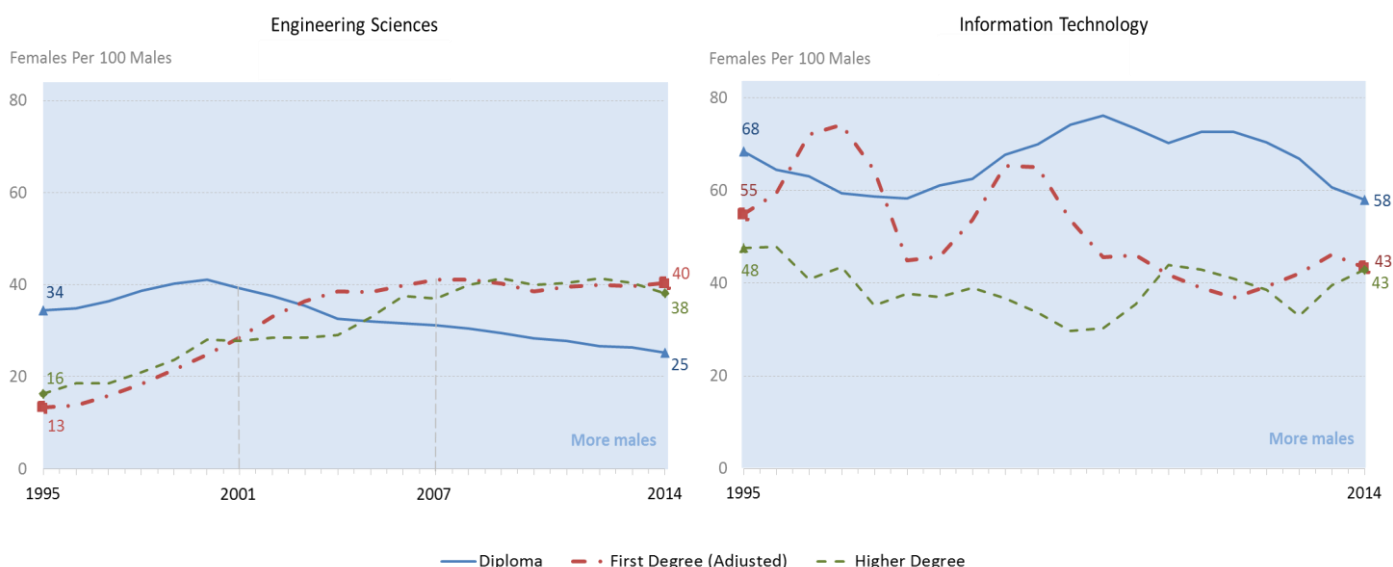
male-dominated fields were *Engineering Sciences* and *Information Technology*. There were only 25 females per 100 males in the *Engineering Sciences* field in 2014 at the Diploma level (Chart 3). The gender ratio was 38-40 females per 100 males at the First Degree (adjusted) and Higher Degree levels in the same year. The ratios for *Engineering Sciences* field at the university levels had been increasing over the years, with the upward trend tapering off from around 2007. In contrast, the ratio for *Engineering Sciences* field at the Diploma level had been decreasing from 2001.

Gender ratios in enrolment for the *Information Technology* field had been fluctuating over the past 20 years across educational levels. In 2014, the ratios were 43 females per 100 males at each of the First Degree (adjusted) and Higher Degree levels, and 58 females per 100 males at the Diploma level.

...but Dominated in Business & Administration for Diploma and First Degree, and Health Sciences for Diploma

In 2014, females outnumbered males in the *Business & Administration* field at the Diploma

CHART 3 FEMALE-TO-MALE ENROLMENT RATIOS IN SELECTED FIELDS OF STUDY, 1995-2014 (FEMALES PER 100 MALES)



5 These fields of study were *Architecture & Building*, *Business & Administration*, *Education*, *Engineering Sciences*, *Fine & Applied Arts*, *Health Sciences*, *Humanities & Social Sciences*, *Information Technology*, *Law*, *Mass Communication & Information Science*, *Natural, Physical, Chemical & Mathematical Sciences*, and *Services*, which are based on the broad groupings of the Singapore Standard of Educational Classification (SSEC). Refer to Table 1 for more details on the fields of study.

(162 females per 100 males) and First Degree (116 females per 100 males, adjusted) levels (Chart 4).

These ratios, however, generally exhibited a downward trend over the past 20 years. For the same field at the Higher Degree level, there had been a rising trend between 2005 and 2014, although females were trailing males (61 females per 100 males) in 2014 (Chart 5).

As one of the top 5 fields of study at the Diploma level in 2014, the *Health Sciences* field had 313 females per 100 males enrolled. However, this ratio more than halved the ratio of 635 females per 100 males in 1995, declining at an average rate of 3.4 per cent a year over the past 20 years.

Female Representation Showed an Increasing Trend in Natural, Physical & Mathematical Sciences and Architecture & Building for Higher Degree

The gender ratio in the male-dominated field of *Architecture & Building* at the Higher Degree level rose over the past 20 years from 19 females per 100 males in 1995, to 93 females per 100 males in 2014 (Chart 5).

These trends were similar to those observed for the *Natural, Physical & Mathematical Science* field at the Higher Degree level, where the ratio rose gradually over the years from 56 females per 100 males in 1995, to 82 females per 100 males in 2014.

Conversely, these 2 fields of study saw a larger female enrolment compared to males for the First Degree level in 2014 (144 females per 100 males for the *Architecture & Building* field, and 142 females per 100 males for the *Natural, Physical & Mathematical Science* field) (Table 1).

CHART 4 DOWNWARD TRENDING FEMALE-TO-MALE ENROLMENT RATIOS IN SELECTED FEMALE-DOMINATED FIELDS OF STUDY, 1995-2014 (FEMALES PER 100 MALES)

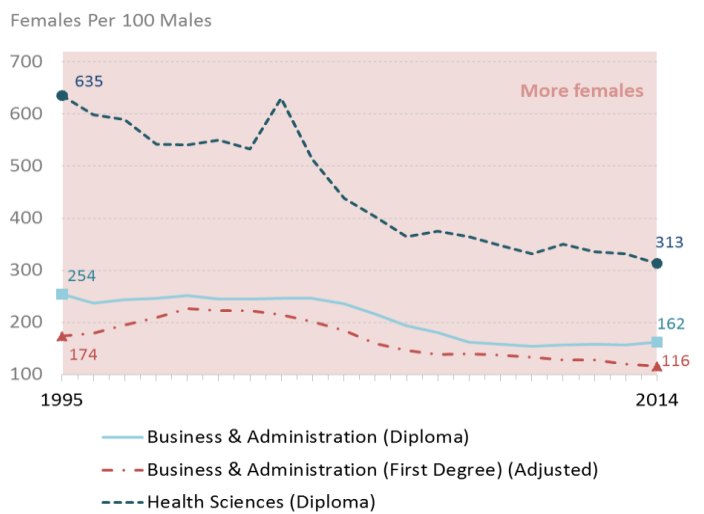
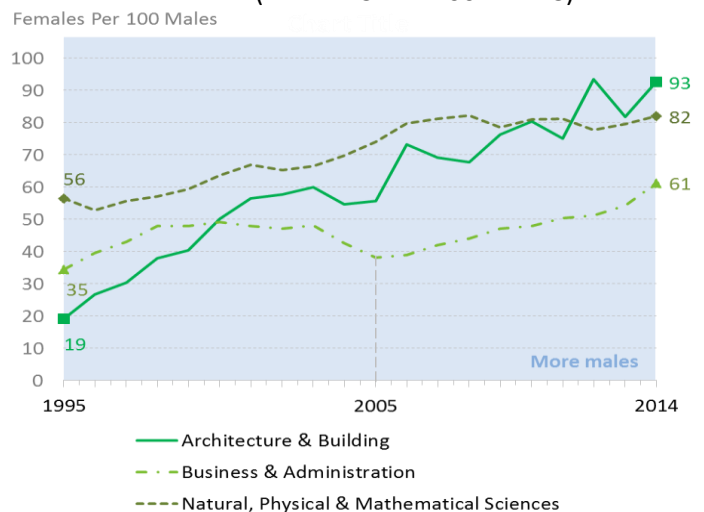


CHART 5 UPWARD TRENDING FEMALE-TO-MALE ENROLMENT RATIOS IN SELECTED HIGHER DEGREE MALE-DOMINATED FIELDS OF STUDY, 1995-2014 (FEMALES PER 100 MALES)



Concluding Remarks

In general, females have been catching up with males in terms of representation in tertiary enrolment. Some heavily male-dominated fields of study, such as *Engineering Sciences*, saw increasing female representation over the past 20 years. At the same time, male enrolment has risen in several fields of study with a traditionally high and above the 1:1 female-to-male ratio, such as *Business & Administration*.