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Degree name and pathway MSC EDUCATION (RESEARCH DESIGN AND METHODOLOGY)
Title of dissertation *How are Singaporean students' experiences in post-secondary education shaping their aspirations and roles in the global city?*
Supervisor DR ARIEL LINDORFF
Subject keywords EDUCATION, GLOBAL CITY, SINGAPORE, POST-SECONDARY, EXPERIENCES, ASPIRATIONS, ROLES
Research methods used MIXED METHODS RESEARCH, SURVEYS, INTERVIEWS, MANN-WHITNEY U-TEST, CHI-SQUARED TEST, THEMATIC ANALYSIS

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ACKNOWLEDGEMENTS

I would like to thank my dad for his constant support and encouragement, who also single-handedly raised my brother and I. My current and subsequent successes are a testament to his love and hard work.

Thank you to the Singapore Armed Forces for the scholarship that supported my undergraduate and postgraduate education in the UK.

Thank you to my supervisor, Ariel Lindorff, who taught me how to think both critically and carefully, and filled in the gaps in my knowledge of research methods.

Last but not least, thank you to whomever it was that did my online survey, as well as the interviewees who took the time to share honestly about their experiences in post-secondary education, their university and career aspirations, as well as the roles that they took on in the global city of Singapore.

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1.0 INTRODUCTION

Singapore was a bustling port city during its independence in 1965 (Lee *at al.*, 2008). However, it took less than a decade for one of its founding fathers, S. Rajaratnam[1], to announce his vision for Singapore to play a significant role in the world economy by becoming a *global city* (see Rajaratnam, 1972). The then Minister for Foreign Affairs made the following case for the young and independent nation: without a geographic hinterland, a large domestic market, or natural resources to speak of, Singapore must depend on global trade and networks for its survival and prosperity (Rajaratnam, 1972, p. 8). In short, "the world is our hinterland," and Singapore is the world's city (Chua, 2011, p. 31).

Although there is no consensus on what a global city is, there is the prevalence of a "global city-speak"; a lexicon that encompasses how people characterise global cities (Acuto & Pejic, 2021, p. 250). This includes global cities as facilitating global knowledge, providing cosmopolitan encounters, and promoting entrepreneurship (Appendix A). These have been studied by academics in the social sciences, especially those in economics, urban geography, and politics (Sassen, 2004; Taylor *et al.*, 2013; Lin *et al.*, 2021). However, there is still room for researchers to provide an educational way of studying and analysing global cities, such as Singapore. Having transformed from a port city to a global city, the Singapore government has used various educational policies and strategies to globalise the city-state, with this being an "entrepreneurial quest to remake the city's fortunes" by promoting "the circulation of global knowledge, actors and talents" (Ong, 2011, p. 11).

In an effort to maximise human capital development, Singapore has established four tiers in its education system (Figure 1). There are six years of compulsory primary education, four to five years of secondary education, two or three years of post-secondary education, and thereafter, university (Ng, 2008). There are two post-secondary pathways that secondary school graduates may choose from: (1) the academic pathway where students study at junior colleges (JCs), or (2) the Technical and Vocational Education and Training (TVET) pathway where students study at polytechnics or the Institute of Technical Education (ITE) (Law, 2008). As a transitional stage before university or employment, these institutions are key to providing "a vital 'ladder' in manpower planning and training to meet the anticipated needs of the new economy" (Lee *et al.*, 2008, p. 193). Currently, about 30% of each cohort pursue pre-university education in the academic pathway and over 60% pursue career-oriented education in the TVET pathway (Varaprasad, 2016). There are thus two key strategies in the Singapore education system; the maximisation of human capital in a small and resource-scare city-state, as well as the streaming of students into various pathways (Law, 2008). These strategies align themselves with the main objective, which is to use education as a means for economic development (Lee et al., 2008).

[1] The first and longest serving foreign minister of Singapore (Ng, 2014).

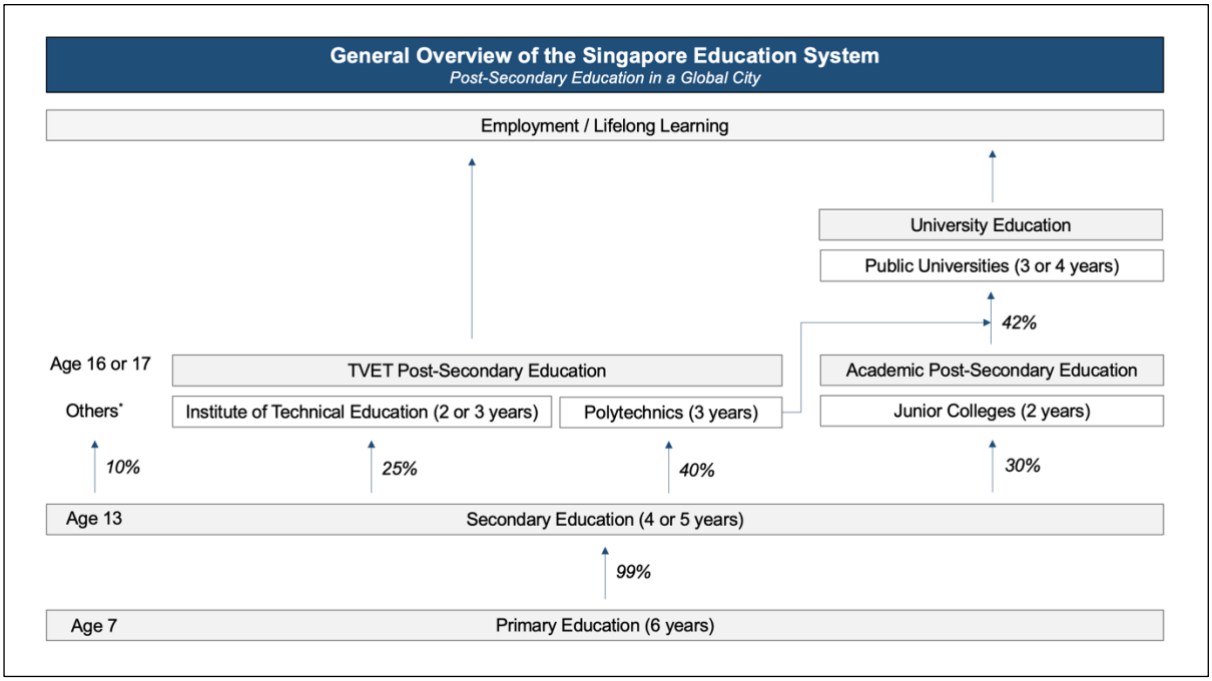


Figure 1. Overview of the Singapore education system, with an emphasis on the post-secondary stage (adapted from Chan, 2008; MOE, 2015; Varaprasad, 2016).

*Others include international schools or employment.

Furthermore, amidst the rapid pace of globalisation in the 1990s, the Singapore government has added a global dimension to its educational strategies, to nurture globally-oriented students for future knowledge-intensive labour (Ong, 2011). In the age of the global city, academic students were taking on roles as government leaders as they aspire towards local public universities and thereafter, careers in the public sector, which includes health services, scientific research and development (R&D), as well as defence. On the other hand, TVET students were taking on roles as corporate executives and global citizens, with more than a third aspiring for an overseas university experience and thereafter, careers in the private sector, which include advertising and finance, as well as arts and entertainment. Yet, despite their divergence in aspirations and roles, academic and TVET students acknowledged that to be Singaporean is to gain global knowledge, have cosmopolitan encounters and develop an entrepreneurial spirit, whereby "[f]or those people who cannot develop the necessary capacities, the Global City may turn out to be another monster – another necropolis" (Rajaratnam, 1972, p. 13). Singaporean students have also been exposed to a wider range of choices and pressures in the global city, as they manage conceptions of rigour and *rabak*, as well as influences by the government and globalisation.

2.0 LITERATURE REVIEW

2.1 The Global City: Human Capital for Advanced Producer Services

Referring to the examples of Beijing and Dubai, Ong (2011) argued that government leaders play a key role during the early stages of urban development. Instead of allowing their cities to be passively shaped by a free and global economy, the Chinese and UAE governments planned and strategised the role that their cities would play in an increasingly interconnected world (Ong, 2011). This meant finding ways to match the strengths of their cities (and country) to the needs of the global economy, which ranged from the export of natural resources to the nurturing of a skilled labour force (Gallagher *et al.*, 2012). However, the later stages of urban development require not just government leadership, but corporate leadership across advanced producer services. Mainly consisting of services in accountancy, advertising, finance, and law (Beaverstock *et al.*, 1999; Sassen, 1991), advanced producer services are "higher order business services" that are the "hallmark of modern global cities" for promoting the globalisation of cities through international offices and networks (Zuzanska-Zysko, 2020, p. 3). Having set up bases in Chinese, Indian, as well as Central and Eastern European cities, advanced producer firms hire local corporate executives to expand their business networks within the city and beyond, into their respective countries or regions (Sassen, 1991). The current body of literature has further identified two other advanced producer services that have grown to cater to a global clientele, and these are information and communications technology (ICT), and consultancy (Table 1).

	Advanced Producer Services	Examples of (Global) Services	Examples of Companies / Firms
1.	Accountancy	Auditing and assurance; payroll services; tax services	Deloitte; EY; KPMG
2.	Advertising	Designing advertisements; marketing research; public relations campaigns	Omnicom; Publicis; Interpublic Group; WPP plc
3.	Consultancy	Management consulting; tax consulting; legal consulting	Bain; Boston Consulting Group; McKinsey
4.	Finance	Insurance; foreign investments; wealth management	Citigroup; Goldman Sachs; JPMorgan
5.	Information and Communications Technology	Computer programming; IT support and infrastructure; telecommunications	Google, Amazon, Apple, and Microsoft
6.	Law	Corporate governance; intellectual property rights; litigation	Dentons; DLA Piper; Kirkland & Ellis

Table 1. The six main advanced producer services in global cities (Sassen, 1991; Beaverstock et al., 1999; Hanssens and Derudder, 2011; Taylor *et al.*, 2013).

However, before advanced producer services can 'globalise' a city, there first needs to be a local education system that can nurture skilled and entrepreneurial workers to work in these careers (Taylor

et al., 2013; Molinaro *et al.*, 2020). An entrepreneurial citizenry is of key importance as cities may be globalised through international business, such as foreign investments or outsourced advertisements, but what has been increasingly evident is that cities become strategic when their populations can innovate new ways of doing international business (Taylor *et al.*, 2013). When looking specifically at the finance sector, whilst London remains dominant in global financial services, New York is strategic for global financial innovations, being the "Silicon Valley of finance" in providing new products and packages in hedge funds, private equity, and venture capital (Sassen, 1999, p. 84). Furthermore, not only does innovation aid a city in achieving global significance, but the status of being a global city also requires evidence of innovation, with a historical study finding that half of all inventions between 2000 to 2014 originated from global cities (Belderbos *et al.*, 2022). As such, global cities are seeking to nurture entrepreneurial students that can go on to spearhead new services and circulate them beyond their cities, such as how Chinese graduates are fuelling Shanghai's development into a technology hub for ICT services in the region (Lai, 2012). Therefore, although it is true that global cities accumulate advanced producer services (Hoyler and Harrison, 2017), it is more accurate to say that global cities nurture a creative class of students to sustain and expand advanced producer services (Florida, 2005).

As a node for international businesses and networks, global cities are also strategic for facilitating a cosmopolitan environment for global citizens (Sassen, 2004). This begins in the early days of compulsory education, whereby students are exposed to knowledge of the world and offered opportunities for cross-cultural interactions, whether is it by hosting foreign students or sending students on overseas trips (Kang, 2013; Verginer and Riccaboni, 2021). It is argued that gaining global knowledge allows urban populations to better navigate and compete in the global talent market (Ong, 2011). However, the current scholarly interest in hypermobile human capital has "contributed to a sense of powerlessness among local actors" who serve the local population through their careers in non-advanced producer services, such as education, healthcare, or transportation (Sassen, 2004, p. 38). In short, global cities require a diversity of workers that serve local and global clients. Thus, a re-emphasis on place – the global city – allows local populations a terrain for politics and engagement on the important roles that they play in global cities (Purcell, 2003). As a pioneer in global cities research[2], Sassen (2015, p. 2) argues that economic aspirations should not take precedence over the aspirations of those who call the global city their home, those who remind government leaders and corporate executives that "[w]e are present, we are not asking for money, we are just letting you know that this is also our city".

Having drawn from a wide body of literature, this dissertation spearheads global cities research through an educational lens and provides the following working definition: global cities are cosmopolitan

[2] According to Beaverstock and colleagues (1999), Pereira and Derudder (2010), and Zuzanska-Zysko (2020).

environments with entrepreneurial workers in a diverse array of sectors, with an emphasis on advanced producer services. By understanding that young people will become the future workforce, educational systems and their institutions can thus shape the trajectory of their (global) cities through their students (Collins and Coleman, 2008). However, global city discourses and rankings have often focused on a select few cities, namely, London, New York, and Tokyo (Sassen, 1991; Beaverstock *et al.*, 1999), although not without scepticism around the methodologies used (see Bunnell, 2015; Conger, 2015). There is, however, a shift away from these traditional examples and a sensitive geopolitical pivot towards other cities in Asia, with Dubai and Hong Kong emerging as international financial hubs (Ong, 2011; Lai, 2012). This pivot to Asian cities acts as a fertile ground for creating a more universal consensus on what it means to be a global city and understanding the various possible educational paths to world-class status (Ong, 2011).

2.2 The Singapore Education Story: From Port City to Global City

Located in the heart of South-East Asia, with a small domestic market of 3.99 million residents[3], Singapore is heavily dependent on international trade and services for its urban and economic development (Law, 2008). Without a hinterland and being only half the size of London, the independent city-state lacks the natural resources to export for financial gains (Gopinathan, 2007). As such, the Singapore government utilises an educational strategy of "fully utilizing its only assets – namely, human resources – as the basis of its competitive advantage in the world economy" (Lee *et al.*, 2008, p. 193). The Singapore education system also closely aligns itself to the manpower requirements of the urban economy, with the government fine-tuning or reforming educational policies as the economy shifts (Goh and Gopinathan, 2008). It is a pragmatic relationship, whereby education serves the economy. The following sections summarise the four main stages of urban development in Singapore – from a port city to a global city – and how the Singapore education system has played a pivotal role in shaping and re-shaping the urban economy.

2.2.1 Port City (The 1960s to 1970s)

During its independence from British colonialism in 1965, Singapore was a bustling port city in Asia, with entrepot activities accounting for 70% of its GDP (Dixon, 1991). Little educational structure or provisions were needed for an economy that was largely based on shipbuilding and ship repair (Leet *et al.*, 2008). However, the sudden pull-out of British naval bases in 1971, which contributed to about one-fifth of the GNP, meant that the port city was set to face a crisis of high unemployment rates (Law,

[3] In 2021, Singapore had a total population of 5.45 million. 3.99 million were Singaporean citizens or permanent residents, and the rest were migrant workers, foreign students, as well as other non-residents (Singapore Department of Statistics, 2022).

2008; Omar and Chan, 2020). This led the Singapore government to implement an export-orientated industrialisation (EOI) strategy by increasing the export of non-durable consumer goods through the expansion of its manufacturing sector (Goh and Gopinathan, 2008). Internally, the EOI strategy required an unskilled labour force, and the emerging education system mainly developed basic literacy and technical skills for manual labour in areas like mechanical engineering, electrical installation, and radio servicing (Ng, 2008). Additionally, in taking on a one-size-fits-all approach, the Singapore government centralised all primary and secondary schools under one public education system, which accelerated the industrialisation process since all students were taught under a uniform curriculum that was aimed at producing a workforce for manual labour (Ng, 2008; Ho and Yun Ge, 2011).

Externally, the EOI strategy required the South-East Asian nation to position itself as a low-labour-cost location, whereby the government adopted a series of open-door policies to attract multinational corporations (MNCs) to set up manufacturing facilities in Singapore and thereafter, export to the global market (Ng, 2008). To enlarge the pool of technically trained manpower, the Singapore government engaged with MNCs like Rollei of Germany, Philips of Holland, and Tata of India to establish TVET centres in Singapore (Law, 2008). There were also bilateral government-to-government negotiations between Singapore and Germany, France, and Japan, which led to the establishment of technical institutes in Singapore to train and re-train local workers[4] (Ng, 2008). Labelled as "brain-drain in reverse", the sharing of technical knowledge and expertise by foreign companies and governments was crucial for just the production of a technical workforce, but in globalising the city-state through wider economic and political relations (Goh and Gopinathan, 2008, p. 21). Towards the end of the 1970s, Singapore transformed itself from a port city into a manufacturing hub, with the manufacturing sector growing to represent over one-quarter of its GDP (Lee *et al.*, 2008).

2.2.2 Manufacturing and Service Centre (The 1970s to 1980s)

However, Singapore soon faced strong competition from other industrialising Asian countries that had larger reservoirs of low-cost and low-skilled labour (Goh and Gopinathan, 2008; Ng, 2008). MNCs started moving manufacturing activities out of Singapore, to newer and emerging Asian economies with lower production costs and a larger, cheaper labour pool, such as Malaysia and China (Ho and Yun Ge, 2011). It was during this period that the Singapore government had to re-think and re-calibrate the education system to ensure the future prosperity of the nation since the EOI strategy was not sustainable for a city-state with a small population. To "diversify sectoral and market dependency, reduce vulnerability, and promote a broader base for the economy [beyond manufacturing]", the service sectors were introduced as the twin pillar – alongside manufacturing – in the urban economy, with a greater

[4] These technical institutes would be later absorbed by the ITE and Nanyang Polytechnic (Law, 2008).

push for skilled labour in STEM-related fields, such as computer software services, engineering design, and scientific R&D (Ng, 2008, p. 56).

To aid in this economic shift, the Singapore government changed its one-size-fits-all approach to a streaming approach under the 'New Education System' in 1979 (Figure 2), which established "clear lines of progress to the university, polytechnics, and vocational institutes[5]" (Goh and Gopinathan, 2008, p. 24). Educational governance during this period was influenced by eugenic beliefs, with the 1984 Graduate Mother Scheme allowing children of women with university degrees to gain priority access to the best primary schools, and this alongside monetary incentives being given to women without GCE O-level qualifications who undergo voluntary sterilisation (Palen, 1986; Ho, 2012). As such, a streaming approach was applied in educational governance, which sees individuals as naturally endowed with different abilities and aptitudes (Law, 2008). Although the formation of diverse pathways was positioned as a means to reduce school drop-out rates, the broader objective of streaming in the 'New Education System' was to sort students into various jobs in the manufacturing and service sectors based on their different abilities and aptitudes (MTI, 1986; Lee *et al.*, 2008). Therefore, a streaming approach that sorts students into various industries was key to the transformation of the Singapore urban economy into a "manufacturing and service centre in the 1970s and 1980s" (Lee *et al.*, 2008, p. 1).

[5] These vocational institutes would be later established as the Institute of Technical Education (Law, 2008).

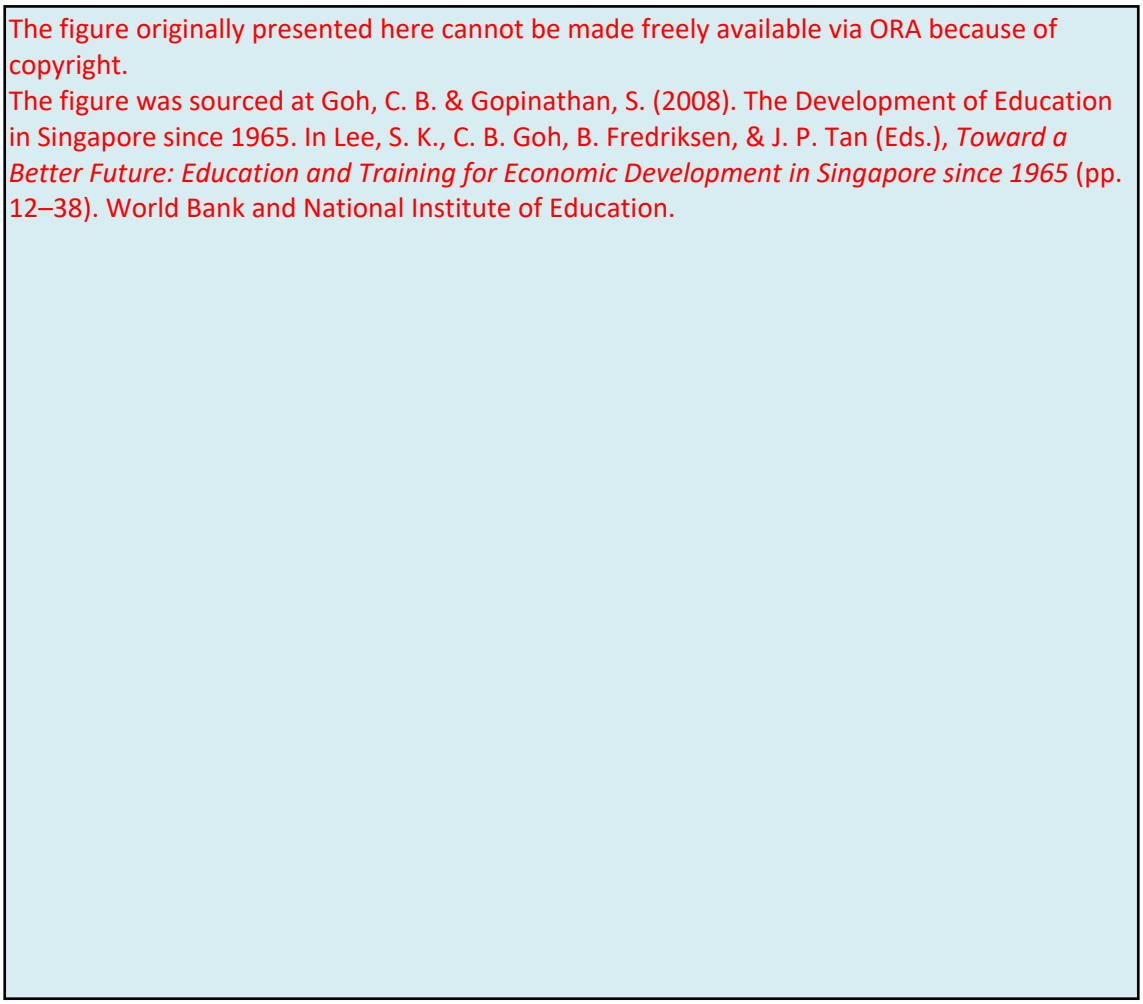


Figure 2. The 'New Education System' in 1979 (Goh and Gopinathan, 2008).

2.2.3 Knowledge-Based Economy (The 1990s to 2000s)

Amidst the rapid pace of globalisation in the 1990s, coupled with subsequent competition in the global talent market for skilled workers, Singapore's "third industrialization phase began in the 1990s", and this was when "Singapore built on its knowledge-based economy" (Ng, 2008, p. 41). During this phase, it was information and innovation, over labour and capital, that were the key drivers of urban development (Goh and Gopinathan, 2008). In order to meet the knowledge and skills requirements of the 21st century, the Singapore education system thus shifted its focus to inculcating creative thinking and a drive for continuous academic achievement so that the citizenry could thrive in knowledge-intensive labour (Lee *et al.*, 2008). This was exemplified in 1997 with MOE's new vision of Thinking School, Learning Nation (TSLN), whereby 'Thinking School' emphasised developing "students with marketable critical and creative thinking skills", and 'Learning Nation' promoted "a culture of lifelong learning and adaptability to changing economic demands" (Alviar-Martin and Baildon, 2016, p. 14). Subsequently, a range of classes and programmes, across all stages in the education system, were used to achieve the four main thrusts of the TSLN vision: creative and critical thinking, IT skills, national belonging, and administrative excellence (Gopinathan, 2007; Ng, 2008).

Furthermore, the Compulsory Education Act 2000 led to mandatory primary education for all children residing in Singapore born after 1996 (Law, 2008). The reduction of school drop-out rates through compulsory primary education paved the way for a new generation of Singaporean students who would have at least 10 years of academic education, from primary to secondary school (Goh and Gopinathan, 2008). It was during this time that the TVET institutions – polytechnics and the Institute of Technical Education – were restructured as post-secondary 'bridges and ladders', alongside the junior colleges (Figure 3). As such, it can be argued that Singapore has entered the "Age of Terrific Deal" where students are offered flexibility and choice in their academic pursuits to cater to the diverse range of abilities and aspirations (Reich, 2001, p. 13). It has also given the growing middle-class population more options and opportunities to get their children into the best schools, and pathways (Ho and Yun Ge, 2011). This ultimately lengthened educational journeys beyond secondary school, with a growing number of students aspiring toward university education (Goh and Gopinathan, 2008). With the push for critical and creative thinking, alongside the growing pool of a highly educated labour force, Singapore had emerged in the 21st century as a "global center for industry, business, finance, and communications" (Law, 2008, p. 115), expanding beyond the twin pillars of manufacturing and services.

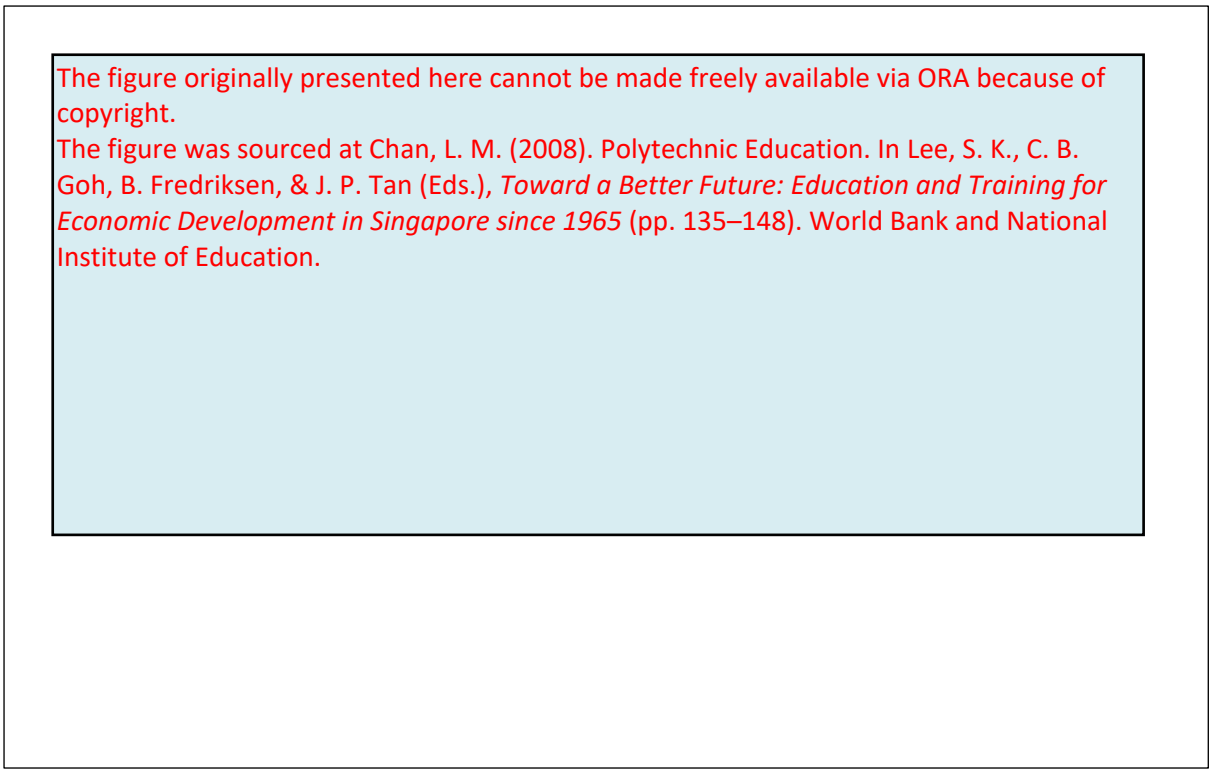


Figure 3. Post-secondary pathways as 'bridges and ladders' (Chan, 2008).

2.2.4 Global City (The 2000s to Present)

The decades spent structuring and re-structuring the education system for urban and economic development has led to what was known in the mid-2000s as the 'Singapore model'[6], which involved the organisation of a complex education system to shape and supply its international business ecosystem (Ong, 2011; Sidhu *et al.*, 2011). The South-East Asian city-state is further described as hosting a pool of multicultural and multilingual students, whereby despite some being groomed to form a creative and executive core (Ong, 2011), all Singaporean students are "urged to move out of their comfort zones and market their talents and expertise to the world" (Goh and Lee, 2008, p. 107). Simply put, the role of Singaporean students is to be globally oriented; be open to acquire knowledge of the world and embody cosmopolitan sensibilities of being English-speaking and pro-Western, but equally at home in the Asian region (Sidhu *et al.*, 2011). Nurturing open and entrepreneurial students is beneficial for promoting greater social and economic diversity, especially for the expansion of the creative economy, which goes beyond science and technology to areas in arts and entertainment, design and more (Goh, 2008). Goh (2008) further argues that flourishing societies are those that have a citizenry that is open to the world – its and ideas – rather than populations that remain insular or orthodox.

[6] This Singapore model has provided normative and technical city plans that has inspired various urban projects in Asia, such as Dalian in China and Manila in the Philippines (Ong, 2011).

As such, by the mid-2000s, the nature and purpose of the Singaporean education system had been altered to reach global standards (Gopinathan, 2007), especially by developing "a desired type of citizen – globally oriented knowledge economy workers" that would embody an urban "packaging of international glamour, talent, and entrepreneurialism" (Ong, 2011, p. 16). In practice, this is seen through Singapore's participation in various international assessments, such as the Progress in International Reading Literacy Study (PIRLS), the Programme for International Student Assessment (PISA), as well as Trends in International Mathematics and Science Study (TIMSS), with its primary and secondary school students emerging at or near the top (Bakar *et al.*, 2020). Furthermore, there have also been studies on the world-class status of local public universities in Singapore, such as the rise of NUS as Asia's leading global university and NTU's partnership with MIT (Sidhu *et al.*, 2011). These agree with Rajaratnam's (1972) argument that the strongest evidence of Singapore's integration into the global economy is the prevalence of its international networks, whether through MNCs or universities. The integration of education into global rankings and representations thus shows a large effort to nurture highly-educated citizens that can compete and collaborate in the *global city* (Ng, 2014).

However, although there have been multiple studies on primary, secondary and university education in Singapore, much less is known about post-secondary education in the global city, which is a key transitional stage before students go on to university or employment (Leet *et al.*, 2008). Additionally, Singapore currently lags behind OECD countries in university education participation, whereby in 2011, local public university enrolment rates were at 23% per cohort (Sidhu *et al.*, 2011), and in 2021, enrolment rates rose to 42% per cohort (Davie, 2021). On the surface, this limits the available pool of highly-skilled citizenry to work in knowledge-intensive labour. Yet, low university enrolment rates have not hindered Singapore's urban and economic development into the global city that it is today. Thus, the next section consolidates the available literature to better understand post-secondary education in Singapore as a key transitional stage in the global city.

2.3 The Post-Secondary Education System in Singapore

Singaporean secondary school graduates go on to pursue post-secondary education in either the academic pathway – junior colleges – or TVET pathway – the ITE and polytechnics (Goh, 2008). Based on the latest figures available, about 30% of each cohort pursue pre-university education in the academic pathway and over 60% enter the TVET pathway (Varaprasad, 2016). In Singapore, the TVET pathway prepares students for the workforce, with the best graduates pursuing further education at local public universities in Singapore (Law, 2008). However, since the academic pathway remains the dominant route for pre-university education, "[f]or the majority of Singapore students, the TVET ends up being the ultimate education achievement" (Bakar *et al.*, 2020, p. 475).

2.3.1 Academic Pathway – Junior Colleges

JCs are pre-university institutions that aim to develop the intellectual capacities of higher-performing secondary school graduates (Chan, 2008). There are currently 22 JCs, with each having an average of about 1,900 students, and this includes institutions with a mixed intake of secondary and post-secondary students (Appendix B). As only about 30% of each cohort are in the academic post-secondary pathway, admissions are competitive and many students have gone on to take up roles as government leaders or corporate executives in the urban economy (Chan, 2008; Varaprasad, 2016), whereby "upon many of them will lie the responsibility of playing key roles in shaping the Singapore of the future" (Ho, 2012, p. 414). As such, Singaporean households generally have a strong preference for the academic pathway, especially since most students go on to attain university degrees (Law, 2008).

Academic students generally spend two years studying for the GCE A-level certificate or equivalent[7], taking subject combinations in either the 'science stream' or 'arts stream'(Eunoia Junior College, 2022). Science stream students take three science subjects, such as Physics, Chemistry and Mathematics, and one art subject, which is usually Economics (Eliana, 2022). Arts stream students have to take three art subjects, such as History, Economics, Literature and one science subject, which is usually Mathematics (Eliana, 2022). There are provisions for a 'hybrid stream' for the small proportion of students taking two science and two arts subjects (Eunoia Junior College, 2022). Additionally, students take subjects at different levels of study, which are called Higher 1 (H1), Higher 2 (H2) and Higher 3 (H3), with H1 covering the least breadth and depth of topics, and H3 covering a wider range and depth of topics (Eliana, 2022). Furthermore, there are also two compulsory H1 subjects that all academic students have to take; General Paper and Project Work. General Paper is where students write essays on global and local issues, and for Project Work, students are given group-based tasks to assess their creative and communication skills (Catholic Junior College, 2015; MOE and UCLES, 2020).

As the pre-university pathway, state-sponsored university scholarships are targeted at Singaporean students in JCs, and these play a key role in the transnational matching between academic students and prestigious overseas universities (Ye and Nylander, 2021). For example, the University of Cambridge and the University of Oxford have both released admissions data that identifies Singaporean candidates as having higher than average success rates amongst their pool of international applicants (University of Cambridge, 2021; University of Oxford, 2021). These scholarships, however, come with a bond and scholarship holders would have to work in the public sector for about five to six years after graduating from their undergraduate or postgraduate education (Ye and Nylander, 2021). These state-sponsored

[7] Four institutions offer the International Baccalaureate, and one institution offers the NUS High School diploma (Appendix A). One institution – Millennia Institute – offers a three-year A-level programme (Millennia Institute, 2022).

scholarship holders, colloquially called ‘scholars’, are then fast-tracked into leadership positions in the public sector, with some being offered opportunities to crossover into politics (Tan, 2008). Ye and Nylander (2015) argue that the identity of being an international student is a strategic means of establishing social differentiation from the rest of the population, with the global educational experience offering students social and cosmopolitical capital. For those that are unable to attain an overseas scholarship, it would have meant “remaining in Singapore and pursuing a ‘socially acceptable’ ‘locally prestigious’ course” (Ye and Nylander, 2015, p. 22).

2.3.2 TVET Pathway – ITE and Polytechnics

Representing about one-quarter of a student cohort, ITE educates future “technicians and skilled personnel” for various sectors in the urban economy (Law, 2008, p. 114), focusing on work that involves installation, production, and maintenance (Chan, 2008). It caters to lower-performing secondary school graduates or early school leavers who did not complete the GCE O- or A-level examinations (Ng, 2008). These students spend about two to three years specialising in various career-oriented fields and graduate with either the National ITE Certificate (Nitec) or Higher Nitec (ITE, 2022a). As a centralised institution, ITE manages three colleges across Singapore, with each college having an average of about 9,300 full-time students (Appendix B). ITE courses are grouped into six main fields, as represented by its six schools, which are applied and health sciences, business and services, design & media, electronics and ICT, engineering, as well as hospitality. In Singapore, before they can pursue a university degree, ITE graduates would have to go to polytechnics first, which would mean another three years of education (Bakar *et al.*, 2020). Based on an internal study by the ITE, for the class of 2011, over one-quarter had obtained Polytechnic diplomas after graduation (Bakar *et al.*, 2020).

Before the 1990s, the Singapore government had grouped polytechnics with universities in the educational structure, whereby both served as launching pads for employment after graduation (Goh, 2008). However, with the increasing need for manpower in the expanding knowledge-based sectors, coupled with growing aspirations for a university degree, polytechnics were thereafter restructured into post-secondary institutions (Law, 2014). As such, whilst some countries have chosen to upgrade their polytechnics into universities (Law, 2008), Singapore has instead restructured its polytechnics into post-secondary institutions, with some having the opportunity for further education at local universities (Chan, 2008). Currently taking in over 40% of a student cohort, polytechnics groom “mid-tier paraprofessionals” by providing career-oriented and practical learning experiences that would be directly translatable to their respective fields (Varaprasad, 2016, p. 53). Each of the five polytechnics in Singapore hosts an average of 13,900 full-time students (Appendix B). Students spend three years specialising in a specific field and thereafter, graduate with a polytechnic diploma (Chan, 2008; Lee *et al.*, 2008). Like the ITE, polytechnics generally offer vocational education in six main fields, which are

applied science and life sciences, arts and media, business and accountancy, engineering, health and social sciences, as well as ICT (Appendix B). Other fields offered at specific polytechnics include architecture, design, environment, and hospitality. In 2020, 30% of polytechnic graduates managed to enrol into one of the six local public universities[8] (Bakar *et al.*, 2020), but this does not include the unrecorded number of polytechnic graduates pursuing degrees at local private universities or universities abroad. Furthermore, over 30% of secondary school graduates who qualify for enrolment into JCs are choosing polytechnics, whereby reasons for this vary and may include a preference for a more hands-on learning experience or employment opportunities right after post-secondary education (Chan, 2008).

The ITE and polytechnics share similarities in their administration and assessments, which include all students having to complete one to six months' worth of industry placements before they can graduate (Teng, 2014). Both ITE and polytechnics also have advisory committees made up of industry experts and practitioners that advise on whether the courses and coursework are relevant to the present and future employment landscape (Chan, 2008). Staying adaptable to shifts in manpower requirements in the Singapore urban economy, TVET intuitions thus regularly offer new hands-on courses or interdisciplinary classes that would enable students "to apply their knowledge and skills to creatively and innovatively solve practical problems from industry" (Chan, 2008, p. 139). Despite both being categorised under TVET, the difference between the ITE and polytechnics lies in a slight variation of practical skills taught, with 60 to 70% of ITE content being hands-on, whilst 50% of Polytechnic content is hands-on (Law, 2008).

2.3.3 'Hierarchy' or 'Bridges'?

Bakar and colleagues (2020, p. 481) argue that the main issue with Singapore's streaming approach lies in how it "has a strong influence on the qualifications to which these leads, and the occupational possibilities linked to these". In terms of attaining university qualifications, Singapore is behind OECD economies in university enrolment rates, whereby local public university enrolment rates rose to a record of 42% per cohort or 17,500 students in 2021 (Davie, 2021). The government remains hesitant to expand the public university education system to meet the increasing desire for university education amongst Singaporean students (Law, 2008), whereby the "peril of overeducation is extolled repeatedly by Singapore politicians" who want to safeguard against unemployment or underemployment (Bakar *et al.*, 2020, p. 475). Yet, amidst a "highly competitive and globalised economic setting that places a premium on educational performance and credentials", those who lack the post-secondary educational

[8] Nanyang Technological University (NTU); National University of Singapore (NUS); Singapore Institute of Technology (SIT); Singapore Management University (SMU); Singapore University of Social Sciences (SUSS); Singapore University of Technology and Design (SUTD).

requisites may be left behind in university and career opportunities (Lai, 2004, p. 13). For example, local public universities remain cautious in accepting TVET graduates as they also have to balance other priorities as 'global' universities in a global city, which involves meeting quotas of international student intakes (Sidhu *et al.*, 2011). As local public university places remain calibrated and limited, this has led the expanding middle-class population to incur financial costs on alternative higher education options: either local private universities or overseas universities (Sidhu *et al.*, 2011). Although MOE has no direct oversight over private universities in Singapore, a parliamentary reply revealed that there were about 6,100 Singaporeans pursuing full-time degrees at local private universities (MOE, 2020). Additionally, UNESCO (2022) reported that Singapore has over 23,000 tertiary-level students studying abroad. There was no numerical breakdown based on post-secondary pathway to understand how many were from the academic or TVET pathway.

Beyond university, with schools as gatekeepers and facilitators of knowledge and professional capital, it is generally accepted that educational institutions can produce various kinds of citizen-workers by shaping the way students see themselves and their future career options (Holloway *et al.*, 2010). It is thus not surprising that academics in Singapore similarly argue that secondary and university education has shaped students' future career aspirations in various ways (Ho, 2012). Referring to an official press release by the MOE in 1997, the roles of post-secondary students were clearly outlined: TVET students are key to the continued "stable social order" of Singapore as they "play their part", and academic students should realise that "upon many of them will lie the responsibility of playing key roles in shaping the Singapore of the future" (Ho, 2012, p. 414). However, the government has since sought to change public perceptions that give "respect for the 'scholar'" and "disdain for the 'mechanic'" because regardless of whether one is an academic or TVET student, they are still primarily a Singaporean student (Law, 2008, p. 131).

Yet, the current body of scholarship identifies the academic pathway as providing opportunities for 'scholars' to become government leaders or corporate executives, whilst TVET students are planned to take on roles as 'mid-tier paraprofessionals' or 'technicians'. The emphasis on roles is important as "future adult roles may be linked to perceptions about what is befitting for someone of his or her social (and educational) background" (Collins and Coleman, 2008, p. 284). To understand how students reach these roles, one needs to study the lived experiences of students in their respective institutions, where their aspirations and ambitions are being formed (Holloway *et al.*, 2010). However, "[m]icro-level data on social class and educational trajectories are generally scarce in Singapore" (Ye and Nylander, 2021, p. 408). Besides the global rankings and national statistics, there is a lack of micro-level data on the lived experiences of Singaporean students in post-secondary education. This provides an opportunity to explore the divergence between the academic and vocational pathways, especially how Singaporean

students' experiences in these post-secondary pathways shape university and career aspirations, as well as their roles in the global city (Bakar *et al.*, 2020).

2.4 Research Aims

The broad aim of this dissertation is to spearhead educational research on global cities in Asia by studying the post-secondary education system in Singapore. It endeavours to build from past geographical and economic research on global cities to offer, most importantly, an educational way of seeing and understanding global cities. Through the broad and in-depth literature review, it is shown that the Singapore education system is a "highly controlled system", being top-down and state-led (Goh, 2008, p. 163). The education system has been effectively used to calibrate Singapore's urban and economic transformation into a global city. Additionally, in the current body of scholarship, there have been multiple studies on the international standards of primary, secondary and university education in Singapore, and limited studies on the post-secondary education system. Furthermore, a strong emphasis on systems and rankings may cause one to neglect the lived experiences of students in global cities (Ong, 2011). Being a key transitional stage towards either university or the workforce, there needs to be an explicit investigation of the various university and career aspirations by post-secondary pathway, and these are to be integrated with qualitative analyses on the roles that academic and TVET students have in the global city. Based on the available literature, my hypothesis is that academic students would take on roles as government leaders or corporate executives as they aspire towards overseas universities and careers across various sectors in the urban economy. On the other hand, TVET students would take on roles as technicians or mid-tier professionals as they aspire toward careers in non-advanced producer services, with some going on to pursue a university education.

The main research question is as follows:

> How are Singaporean students' experiences in post-secondary education shaping their aspirations and roles in the global city?

The following are three research questions to support the main research question:

1. What are academic and TVET students' experiences in post-secondary education in Singapore?
2. What are the university and career aspirations of academic and TVET students in Singapore?
3. What are the roles of academic and TVET students in the global city?

3.0 RESEARCH DESIGN AND METHODOLOGY

This section explains the research design and methods used for this study (Figure 4). It will first introduce the mixed methods research design, and thereafter, it will detail the quantitative and qualitative methods used. The limitations and ethical issues faced will be discussed at the end.

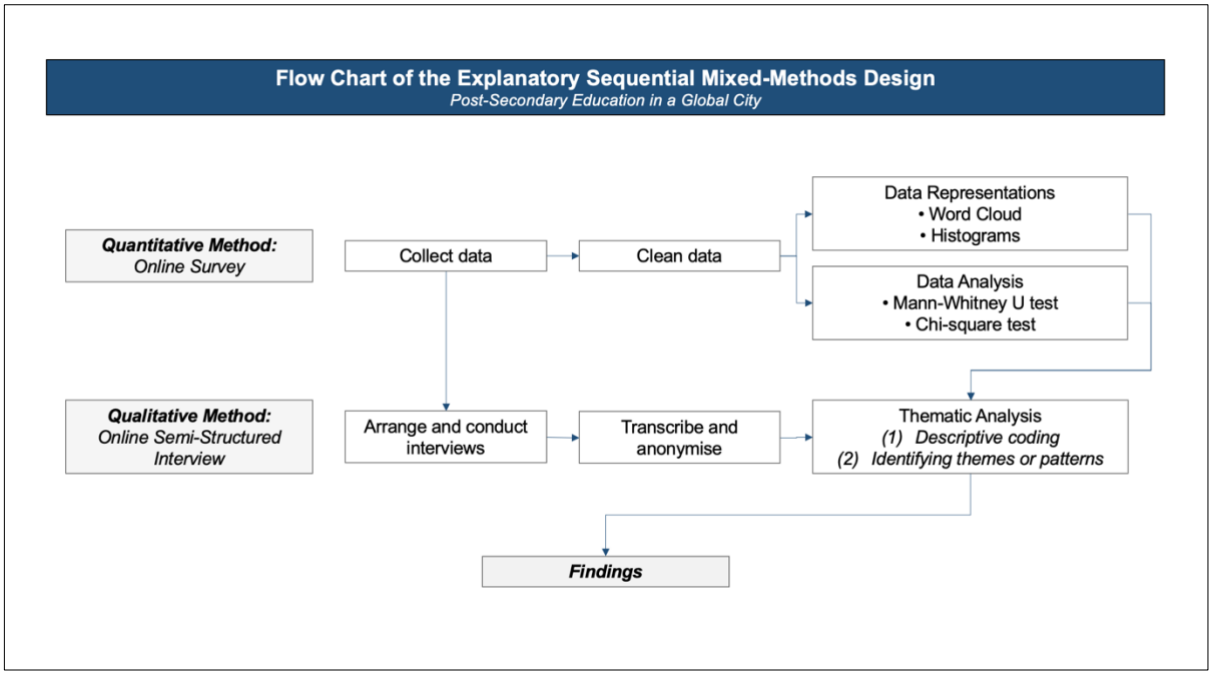


Figure 4. Flow chart of the explanatory sequential mixed methods design (Author's own, 2022).

3.1 Explanatory Sequential Mixed Methods Design

Although the field was formally established in the 1970s, mixed methods research has been around since the 19th century[9] (Guest, 2012; Creswell and Plano Clark, 2018). Mixed methods research recognises the strengths and weaknesses of qualitative and quantitative methods and integrates them both to ensure a robust study (Creswell, 2006). By complementing sizeable quantitative datasets with explanatory or exploratory qualitative methods, broad and in-depth results can be achieved (Holloway *et al.*, 2010). However, one of the current weaknesses of mixed methods research lies in how some have used such research designs for its popularity, without clearly explaining the meaning and relevance of the designs used (Guest, 2012), which this dissertation will endeavour to do.

Having originally offered 15 mixed methods designs (Creswell and Plano Clark, 2011), Creswell and Plano Clark (2018) have since consolidated them into three core research designs: (1) convergent, (2)

[9] An early example was John Snow's research on how the Broad Street pump handle was the source of cholera epidemics in London in the mid-1800s (Johnson, 2006).

explanatory sequential, and (3) exploratory sequential. Across all three research designs, qualitative and quantitative datasets are meaningfully combined and integrated, whereby the point of integration is known as the "point of interface", which "refers to any point in a study where two or more data sets are mixed or connected" in, for example, "three sequential phases" (Guest, 2012, p. 146). During the research design stage, two dimensions – purpose and timing – should be clearly communicated (Guest, 2012). Although some consider the weighting of data as an important dimension, which is to decide whether the qualitative or quantitative dataset is to be emphasised in the findings, this decision may limit the results to a pre-determined emphasis and it is advised that any relative emphasis on either the qualitative or quantitative results should emerge in the data interpretation stage, and not the research design stage (Teddlie and Tashakkori, 2009).

Regarding the timing of the interface, quantitative data collection was done first and then alongside qualitative data collection, with potential interviewees recruited through the survey. The purpose was for interviewees to elaborate and explain their own survey responses. Additionally, quantitative data analysis was done before qualitative data analysis, whereby the purpose was to use the qualitative findings to explain the initial quantitative findings. Due to the time constraints of this study, the timing and purpose of the interface revealed both explanatory sequential and convergent elements, whereby qualitative data collection had to happen simultaneously with the quantitative data collection and analysis. It was thus difficult to neatly place the research design into either the explanatory sequential or convergent design. Yet, as the "primary intent" of the research design was "to use a qualitative strand to explain initial quantitative results", the explanatory sequential design was found to be the best fit (Creswell and Plano Clark, 2018, p. 136).

This shows the limits of over-emphasising typologies in mixed methods research because ''the actual diversity in mixed methods is far greater than any typology can adequately encompass'' (Maxwell and Loomis, 2003, p. 244). Rather than being too caught up with typologies, Guest's (2012) recommends focusing more on the timing and purpose of interface to reason for the best choice of research design. This is not to discredit previous research on mixed methods typologies, which has helped to provide a common language and structure to mixed methods research (Teddlie and Tashakkori, 2009), but it is arguably more important to be clear and accountable in the reasons for choosing the explanatory sequential design, rather than showcase knowledge of the varied mixed methods lexicon (Guest 2012).

3.2 Quantitative Methods

3.2.1 Data Collection – Online Surveys

Survey Design. The purpose of the online surveys was to collect a breadth of quantitative data on experiences in post-secondary education, as well as university and career aspirations. The survey consisted of closed, scale, and open-ended questions and it drew from knowledge gained from the literature review, which included key global city experiences like cosmopolitan encounters and entrepreneurship (Appendix C). There were four categories[10] of university types, which were 'local public universities', 'local private universities', 'top overseas universities', 'other overseas universities'. The example given for local public universities was NUS and the example given for top overseas universities was Harvard. There were 17 categories for careers, with six as advanced producer services and 11 as non-advanced producer services. The list of careers paralleled the official list of industries in the 2020 Singapore Standard Industrial Classification, with an emphasis on advanced producer services (MTI, 2020). The end of the survey will also include a section for participants to indicate their interest in taking part in a follow-up online interview.

Sampling Strategy. The survey was meant for those who were attending or had graduated from a post-secondary institution in Singapore and were at the time of responding between 18 to 35 years old. As post-secondary education begins at age 17 onwards, 17-year-olds were not recruited due to their lack of time spent in post-secondary education. As the focus of the study was on Singapore as a global city, the age group reflected students who attended a post-secondary institution from the mid-2000s onward, which was how the upper age limit of 35 came about. To maximise the number of respondents, three online recruitment methods were used. First, emails were sent to post-secondary institutions and a request was made for the online survey to be distributed to their students and alumni. Second, social media posts were made on Facebook and Instagram. Third, snowball sampling was used as well since the text in the email and social media posts gave the recipient an opportunity to share the survey with others. The aim was to have 200 respondents, and this number was decided based on sufficiency for the intended analysis, and precedence when referring to how previous educational researchers collated surveys in the hundreds. Overall, the survey garnered 256 eligible respondents[11], with 120 (46.9%) from the academic pathway and 136 (53.1%) from the TVET pathway.

[10] There were initially five categories but 'others' was merged with 'overseas universities in big cities' to form 'other overseas universities'. There were only 6 (2.5%) responses in 'others', which were all overseas universities.
[11] Removed 16 responses – six were not within the 18 to 35 age group, eight attended other post-secondary pathways like international schools, and two were blank responses.

3.2.2 Data Analysis – Mann-Whitney U and Chi-Square Test

Having collected a range of categorical datasets from the online survey, statistical tests appropriate for categorical variables, rather than continuous measures, were used. Four key categorical variables were identified, and these were data on (1) post-secondary pathways, (2) five-point rating scales on post-secondary experiences, (3) university types, as well as (4) careers. As there were only two post-secondary pathways – academic and TVET – the data was a dichotomous nominal variable. Ratings on the five-point scales consisted of 'strongly disagree', 'disagree', 'neutral', 'agree', and 'strongly agree'. Having a logical order from strongly disagree to strongly agree, without equal or numerical differences between the ratings, the five-point rating scales were deemed as ordinal data (Field, 2009). For data on university types and careers, there was no logical order between the categories, whereby local public universities were not 'above' other overseas universities, and a career in law was not 'higher' than a career in education. As it was not possible to meaningfully rank the categories for both datasets, university types and careers were thus nominal variables (Stevens, 1946).

An independent group t-test should be used to determine whether the ratings on the five-point scales differed between academic and TVET students. However, as the five-point rating scales were not continuous variables, whereby only continuous measures can be normally distributed, the assumption of normality was not met and parametric tests could not be used (Field, 2009). Therefore, a non-parametric test had to be used since they mostly operated by ranking the data and this meant that assumptions on equal variances of subgroups and normal distribution were relaxed (Field, 2009). As the non-parametric equivalent of the independent group t-test, the Mann-Whitney U-test was selected as the appropriate statistical test and for this test, the dependent variable would be an ordinal variable – the ratings on the five-point scales – and the independent variable would be a dichotomous nominal variable – the binary post-secondary pathways. SPSS was used to run the test, and ratings on the five-point scales were re-coded to a scale of one to five, with strongly disagree as one and strongly agree as five. All observed values were rank-ordered from lowest to highest, and thereafter, a mean rank per group was produced, whereby "the group with the lowest mean rank is the group with the greatest number of lower scores" and "the group that has the highest mean rank should have a greater number of high scores" (Field, 2009, p. 548).

As a test of association, Pearson's chi-square test was used to determine whether across the four university categories and 17 career categories (dependent variable) differed between academic and TVET students (independent variable). Pearson's chi-square was the most suitable statistical test since it is used to determine the relationship between two nominal or categorical variables, which was the case for the binary post-secondary pathways and the nominal variables of university types and careers,

which were nominal data. There is also a key assumption to be met, which is that there should be no fewer than 5 expected counts in any cell.

3.3 Qualitative Method

3.3.1 Data Collection – Online Semi-Structured Interviews

Interview Design. The purpose of the online interviews is to acquire depth of information as statistical analyses alone do not explain students' experiences, especially how students' aspirations and roles in societies are shaped by the institutions they attend (Holloway *et al.*, 2010). The interviews investigated the reasons behind certain university and career aspirations, as well as how the interviewees viewed their roles in a global city. The interviews lasted up to an hour, allowing for participants to engage in a meaningful reflection on their post-secondary education, as well as their university and career choices afterward. The information sheet and interview questions can be found in Appendix D and E.

Sampling Strategy. Potential interviewees consisted of those who were attending or had graduated from a post-secondary institution in Singapore and were at the time of responding between 18 to 35 years old. They would also need to have the technological means to engage in an online interview on Microsoft Teams. Potential interviewees were identified through the surveys, whereby the survey will provide an option for them to consent to take part in an online interview and subsequently, these interviews were arranged through email, with an information sheet sent to participants before the interview. The aim was to have 20 interviewees as the number of participants for the online interview is expected to be smaller as not every participant in the online survey would want to take part in the online interview. 22 people were interviewed, with 10 from the academic pathway and 12 from the TVET pathway (Table 2).

Interviews		
	Academic	*TVET*
Number of Interviewees	10	12
University Aspirations (Select all that apply)		
Local Public University	5	8
Local Private University	1	3
Top Overseas University	7	3
Overseas University	6	7
*Career Aspirations**		
Advanced Producer Services	2	4
Mixed	4	3
Non-Advanced Producer Services	4	5

Table 2. Frequency table of the number of interviewees by post-secondary pathway, as well as their university and career aspirations. A frequency table was used to ensure anonymity.

* Select up to three of 17 career choices. If all three fell were advanced producer services, the respondent would be deemed as pursuing a career in advanced producer services, and vice versa for non-advanced producer services. Selections consisting of both fell under the 'Mixed' category.

3.3.2 Data Analysis – Thematic Analysis

As a data analysis method, thematic analysis was used to identify and report repeated themes or patterns across the breadth of qualitative data collected (Braun and Clarke, 2006). This was done through a systemic coding process, by creating a set of descriptive codes to make sense of the large chunk of qualitative data collected, and thereafter, extracting and constructing themes from them (Creswell, 2015; Kiger and Lara Varpio, 2020). By indexing the data, textual data was deconstructed and pieced back together in a coherent manner that answered the research questions (Creswell, 2015). The coding process was thus a decision-making process, with decisions made based on the context of the study, which included the research design, research questions, as well as practicalities like word count (Elliott, 2018).

Although there were various ways to go about conducting a thematic analysis, these were broken down into two main stages. The first stage involved descriptive coding – either a single word or a short phrase – which required low-level inference (Saldaña, 2016; Kiger and Lara Varpio, 2020). Scholars diverge in their recommendation on how many codes a researcher should have, from 30 to 300 (Elliott, 2018), but Creswell (2015) recommended starting with 30 to 50 codes at the start and reducing these to 20 by taking out overlapping or redundant codes because not everything should be coded when taking into consideration the practicality of word counts and time-constraints (Appendix F). Additionally, although some researchers may use only priori or emergent codes, this paper used both to draw knowledge from the literature review and remain open to findings presented by the interviewees that may not be available in the present body of scholarship (Elliot, 2018). The second stage of the thematic analysis was more inferential as I brought together related descriptive codes into a smaller number of units called themes to convey a common idea (Creswell, 2013; Punch, 2014). During the second stage, the 20 codes were collapsed into about three main themes – experiences, aspirations and roles – which served as the main qualitative findings (Elliott, 2018). The themes were iteratively tested and refined through several phases of coding and analysis to establish rigour and prevalence in the emergent themes (Miles and Huberman, 1994).

3.3 Limitations and Ethics

As educational research on global cities was admittedly limited, there was a lack of a coherent body of scholarship to inform my research design. However, the lack of available literature on post-secondary education in Singapore works in favour of this research, which aims to uncover original findings on how experiences in post-secondary education shape aspirations and roles in the global city and may be useful for future educational research on global cities. Additionally, since the context of this dissertation revolves around the academic and TVET post-secondary pathways in Singapore, the survey and interview data have been similarly contextualised to the academic and TVET post-secondary pathways. However, experiences can and do vary even within each pathway, such as between institutions or individuals, and such variations will be included when relevant to the research aims in Section 2.4.

Language. Although English is the lingua franca of Singapore, at times, Microsoft Teams could not pick up the colloquial form of English that is used in Singapore known as Singlish. Singlish is an English-based creole that uses words from the Malay language and Chinese dialects like Hokkien and Cantonese (Seilhamer and Kwek, 2021). Additionally, as Singapore is a multi-ethnic country, some Malay and Mandarin words were occasionally used. This study has chosen to keep the non-English terms used to offer transparency and cultural relevance in the results, with English translations provided.

Anonymity. Regarding the online surveys, all survey data was anonymous during the point of collection, except for those who indicated an interest in the online interviews as their contact details will be recorded. Regarding the online semi-structured interviews, when quoting interviewees, this dissertation will only state three descriptors, which are the participants' (1) age, (2) post-secondary pathway, and (3) main area of study or work. Any identifiable information was masked, which included the interviewee's post-secondary institution or scholarship body, and descriptions of specific places or interactions that would have led to interviewees being made identifiable. Before the submission, I also sent a draft of the findings to the interviewees so that they could see how their quotes were used, and they could also change or retract their quotes. Interviewees were also free to withdraw at any point of the study, without reason, with the last date for withdrawal being 1 August 2022. All contact information of the interviewees will be deleted at the end of the study.

4.0 FINDINGS

This section provides empirical and original findings to answer (1) what are academic and TVET students' experiences in post-secondary education in Singapore, (2) what are the university and career aspirations of academic and TVET students in Singapore, as well as (3) what are the roles of academic and TVET students in the global city. By answering these, a coherent and comprehensive discussion will be done on the main research question: how are Singaporean students' experiences in post-secondary education shaping their aspirations and roles in the global city?

4.1 Experiences in Post-Secondary Education

4.1.1 Lived Experiences



Figure 5. Word cloud of survey responses that described experiences in the academic (left) and TVET (right) post-secondary pathways. Terms from the world cloud will be italicised in this sub-section.

For students in the academic pathway, "the objective here is for you to get the highest possible grade", and "the measure of success is a scholarship" (31, Academic, Consultancy). As experiences in post-secondary education were directed towards attaining good grades or scholarships, "many of my classmates worked from almost the time when they got up and started school, to when they slept" (25, Academic, Scientific R&D). This perpetuated what was known as a "mugger culture" where students were "constantly trying to do your homework, studying, preparing for the next common test or exam" (30, Academic, ICT). Furthermore, to keep track of their students' academic performance, "all JCs do practice ranking people's performance through internal examinations", and this increased the pressure on students to do well academically to avoid "bad consequences", such as parents being called up or students having to retain a year (22, Academic, Finance). Overall, having to endure a *rigorous* mugger culture led academic students to describe their experiences in post-secondary education as *stressful*, with them being *focused* on meeting a set of narrowly defined goals.

From a macro perspective, the *intense* and *competitive* nature of the academic pathway works as their grades and scholarships make up an impressive portfolio, with these students going on to study at the best universities in Singapore and around the world. However, when studying their lived experiences, students described a *sheltered* and *homogenous* environment, being embedded into the same kind of mugging lifestyle. This manifested itself in negative ways because "to sit down and study in the same manner every day" was not ideal and eventually, "I just started crying" (22, Academic, Defence). For another, "I had a mental breakdown in the exam and I had an S", which was the passing grade in the A-level examination (31, Academic, Consultancy). Admitting that "it's a school, and at the same time, it's hell", the best outcome for academic students would be to get the right grades and scholarships so that they could move on to university, preferably one that was overseas (25, Academic, Scientific R&D). Academic students saw their stress as temporary, and necessary to meet their aspirations for further education at a university.

> My main beef with the entire JC education was that it was just studying for the A-level. It was just a means to an end, which is university, right? So a lot of studying. It was a very pragmatic or instrumental view of education. You just get the grades and then move on.
>
> 30, Academic, ICT

I intended to use the same priori codes, such as timetables and exams, for the TVET interviewees, but the more I insisted, the shorter the replies from the interviewees. As such, I gave room for the interviewees to share honestly about experiences that were memorable or representative of the TVET pathway, and an emergent code surfaced: social activities. This involved a plethora of activities "beyond just studying and doing academics" (23, TVET, Social Services) where students would "study together, sometimes dance together, we usually just eat dinner and play games, then sometimes you go out – go sing k[araoke], go party" (25, TVET, Engineering). For students that preferred to stay indoors, they may "go home straight and play Left for Dead" or other computer games with their peers (27, TVET, Arts). Summarising the TVET experience in a single statement, an interviewee said "just imagine an American high school, where you date so on and so forth. Have *fun*" (27, TVET, Advertising).

> I had the best three years of fun in my life. The fun could be just doing [co-curricular] activities. It could be overseas adventure trips. It could even be, after school, going to the club and just purely hanging out with friends.
>
> 26, TVET, Consultancy

However, interviewees added that these social activities could also act as a "double-edged sword" since "there was no prompt to help me realize that you need to study" (27, TVET, Advertising). With some

having experienced “a lot of drinking” and “a lot of poor money management” (22, TVET, Finance), TVET interviewees shared that “you have the autonomy” to *explore* “how choices can cascade into consequences. If you choose not to attend your lectures, not to take your studies seriously, then you just end up with a bad GPA” (26, TVET, Consultancy). However, the autonomy may also lead to beneficial outcomes as it “forces you to learn to be more decisive with your time” (27, TVET, Arts). Eventually, TVET interviewees came to a common consensus that the autonomy to make their own mistakes and successes was *enriching* and *eye-opening* for them because “it's the years that you are growing up and you're developing yourself”, (23, TVET, Social Services). It was the “growing pains” of, for example, being “exposed to smoking for the first time” and learning their preference that they “would never do it again” (25, TVET, Arts). Having navigated the mess of social activities, “you mature faster” (26, TVET, Advertising). In place of *fun*, an interviewee used a broader term called ‘rabak’ to describe the TVET experience; a Singlish word, originating from the Malay language, that is used to describe something messy, or someone who is the life of the party – *fun* (Goh, 2020; Wong *et al.*, 2022).

> ‘Rabak’ is very telling of not just who we are, but the fact that the Poly experience can be summed up as that as well. It's a coming-of-age mess that you just have to go through, which is very important for kids in general.
>
> 25, TVET, Arts

Thus, academic and TVET students had contrasting lived experiences in post-secondary education. Academic students generally had a stressful and sheltered experience, being embedded within a mugging culture where students were continuously tested and benchmarked against each other. This rigour was crucial for students to attain good grades and state-sponsored scholarships that would provide them better chances of getting into the best universities in Singapore and around the world, which was where “life really starts and you’re a kid until you enter uni” (22, Academic, Health Services). On the other hand, the TVET experience provided a fun experience where students had to explore and learn for themselves how choices had consequences. The pathway was “a very good representation of the real world” because there were “people who are very precautious, and then you go to top places”, and “people who absolutely cannot deal with the extreme freedom… then they just flunk” (30, TVET, Education).

4.1.2 Global Knowledge, Cosmopolitan and Entrepreneurial

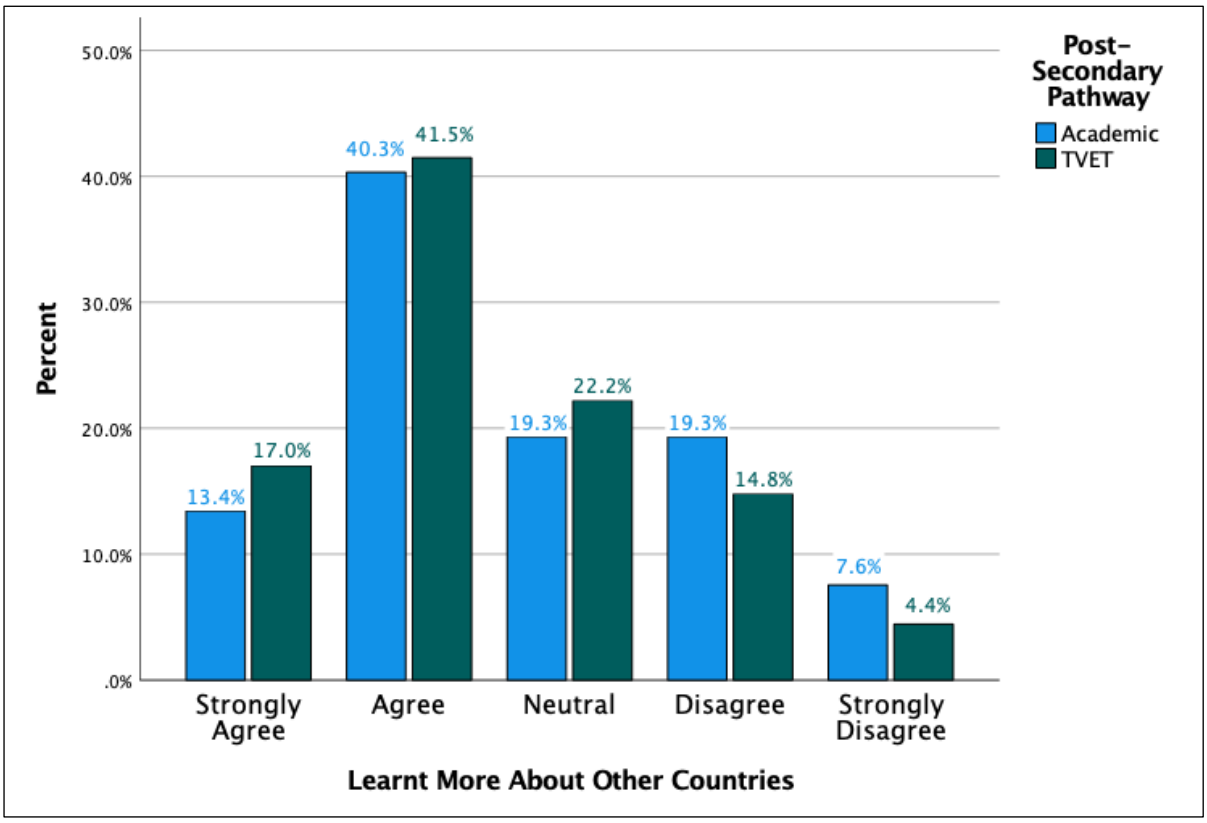


Figure 6. Survey results for whether Singaporean students learnt more about other countries during post-secondary education.

In terms of gaining global knowledge, 40.3% of academic students and 41.5% of TVET students agreed that they learned more about other countries during post-secondary education. The Mann-Whitney U-test was used to determine whether academic and TVET students differed in their rating of 'learnt more about other countries'. The results showed that the difference in ratings between academic students (mean rank = 122.71) and TVET students (mean rank = 133.61) was not statistically significant, $U(N_{academic} = 120, N_{TVET} = 136) = 7465.50$, z = -1.23, $p = .220$.

Interviewees from the academic pathway shared that they mainly gained global knowledge through the taught subjects. Besides the art subjects like Economics and Geography, interviewees specifically recalled General Paper, which was a compulsory subject where students had to do readings and write essays on "current affairs all over the world" (25, Academic, Scientific R&D). Furthermore, certain special programmes provided structured lessons on various cultures and countries. For example, students in the Bicultural Studies Programme "are supposed to be bilingual and bicultural so there's an emphasis on learning Chinese" (26, Academic, Public Administration and Defence). The taught curriculum was also sometimes complemented with overseas trips, with interviewees recalling how

some peers went to China, Indonesia, Malaysia, Taiwan, and the US. However, only a select few students could go on these overseas trips, and one was likelier to go "if you were stellar enough to be able to juggle the insane amount of workload" in the academic pathway (30, Academic, ICT).

TVET students mainly learnt about the world through overseas trips to various parts of the world, with interviewees listing Cambodia, China, Hong Kong, Indonesia, Japan, Laos, Malaysia, Taiwan, Vietnam, and the US. The ITE and polytechnics partner with various foreign universities and schools to facilitate overseas trips for their students, as part of their modules or coursework. This included completing a final year project in Hong Kong where "everybody did different things so we could learn from a lot of different sectors in Hong Kong" (23, TVET, Social Services), as well as a trip to "Ipoh in Malaysia to make a documentary based on the people that were living in the town" (25, TVET Advertising). TVET students also had opportunities to do internships abroad or in MNCs and this differed from the previous example as the partnering organisations would be companies instead of academic institutions. For example, "I was fortunate enough to do my intern in Japan... I did a two-month project with Japanese students to pitch to a game company" (27, TVET, Arts). This shows that the way that TVET students gained global knowledge contrasted with counterparts in the academic pathway. For academic students, the taught curriculum was the main method used to impart global knowledge, whilst TVET students learnt more about the world through various overseas trips as part of their coursework or internships.

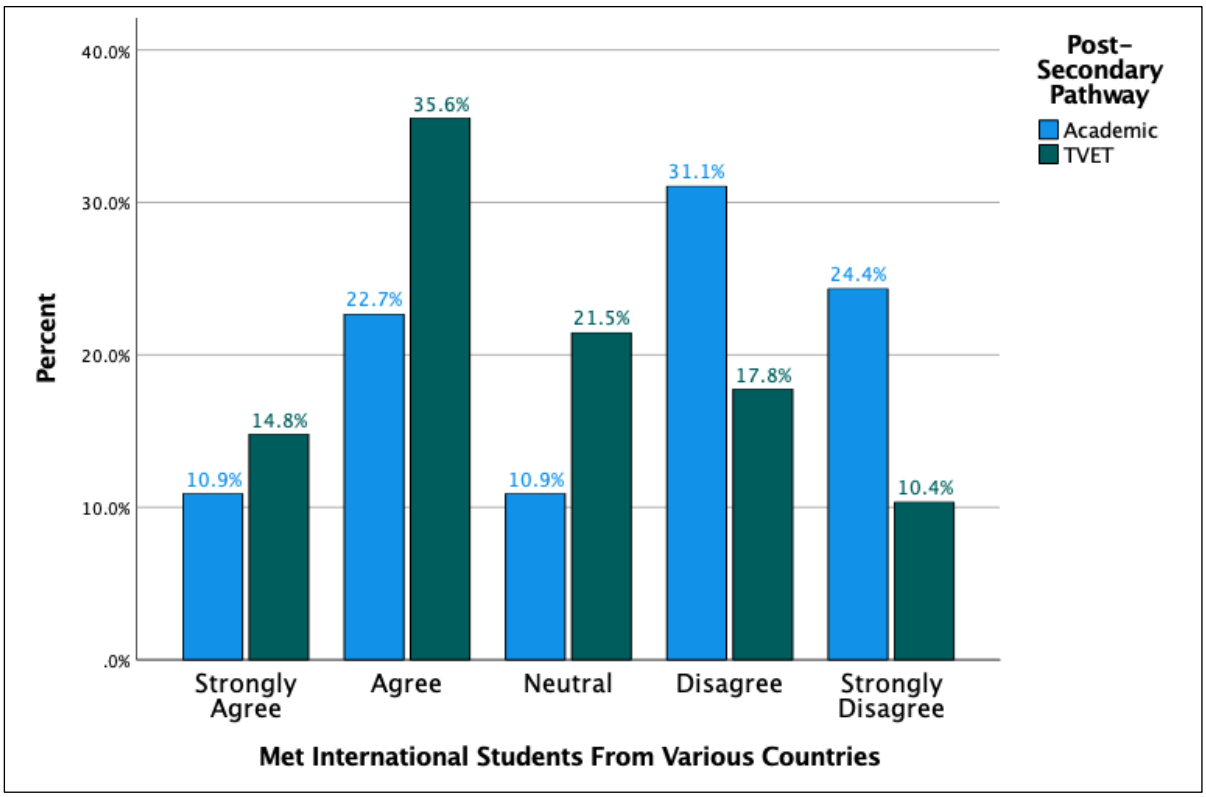


Figure 7. Survey results for whether Singaporean students met international students from various countries during post-secondary education.

Regarding cosmopolitan encounters, 31.1% of academic students disagreed and 35.6% of TVET students agreed that they met international students from various countries. The Mann-Whitney U-test was used to determine whether academic and TVET students differed in their rating of 'met international students from various countries'. The results showed that the difference was statistically significant, $U(N_{academic} = 120, N_{TVET} = 136) = 6049.00$, z = -3.66, $p < .001$. There were significantly more TVET students (mean rank = 144.02) who agreed that they met a diversity of international students than academic students (mean rank = 110.91).

The partnerships between TVET institutions and foreign academic institutions or companies allowed for TVET students to meet international students during their overseas trips. Being in a foreign environment meant that TVET students were expected to adapt and learn about the place they were travelling to. Recreational time abroad also allowed for cross-cultural friendships to foster, for TVET students to "make a few friends there – they bring us around, go and eat" (25, TVET, Engineering). The reciprocal nature of these partnerships also meant that there were exchange programmes for TVET students to host "people from Europe, especially when you take those cross-disciplinary subjects" (30, TVET, Education). These partnerships thus provided a mutual flow of TVET students going abroad to learn about other parts of the world and international students coming to Singapore.

> I managed to go to Japan and we weren't the only school that was there. There were also people from France, and also international students already studying in the school, like from Germany and Bulgaria. So we managed to talk to them, and know more about their country and their school. Some of them also came to [name of TVET institution] for exchange programmes.
>
> 27, TVET, Arts

On the other hand, interviewees from the academic pathway who had met international students shared that it was mostly through encounters with international students studying at their JCs. However, there were different proportions of international students across the JCs because for those seeking to enter the pre-university pathway in Singapore, they would be "aiming for [name of three JCs] rather than a mid-tier JC" (30, Academic, ICT). These few JCs were selective in their application processes, mainly hosting international scholars like "ASEAN scholars who typically come from countries like Malaysia, China, Vietnam, Thailand" (22, Academic, Finance). This differed from how TVET institutions were generally less selective in their application processes, taking in "a lot of people from the general South-East Asian region cos they were viewing the Poly diploma as a more terminal diploma" to enter the workforce after graduation (30, TVET, Education). Furthermore, even for the JCs that had a larger group of international students, "it wasn't about understanding how was it like for [them] growing up," but "more of expecting people to understand Singapore" through the classroom setting (32, Academic,

F&B). Therefore, the international-ness of these East and South-East Asian students had to be placed aside to adapt to the local Singapore environment.

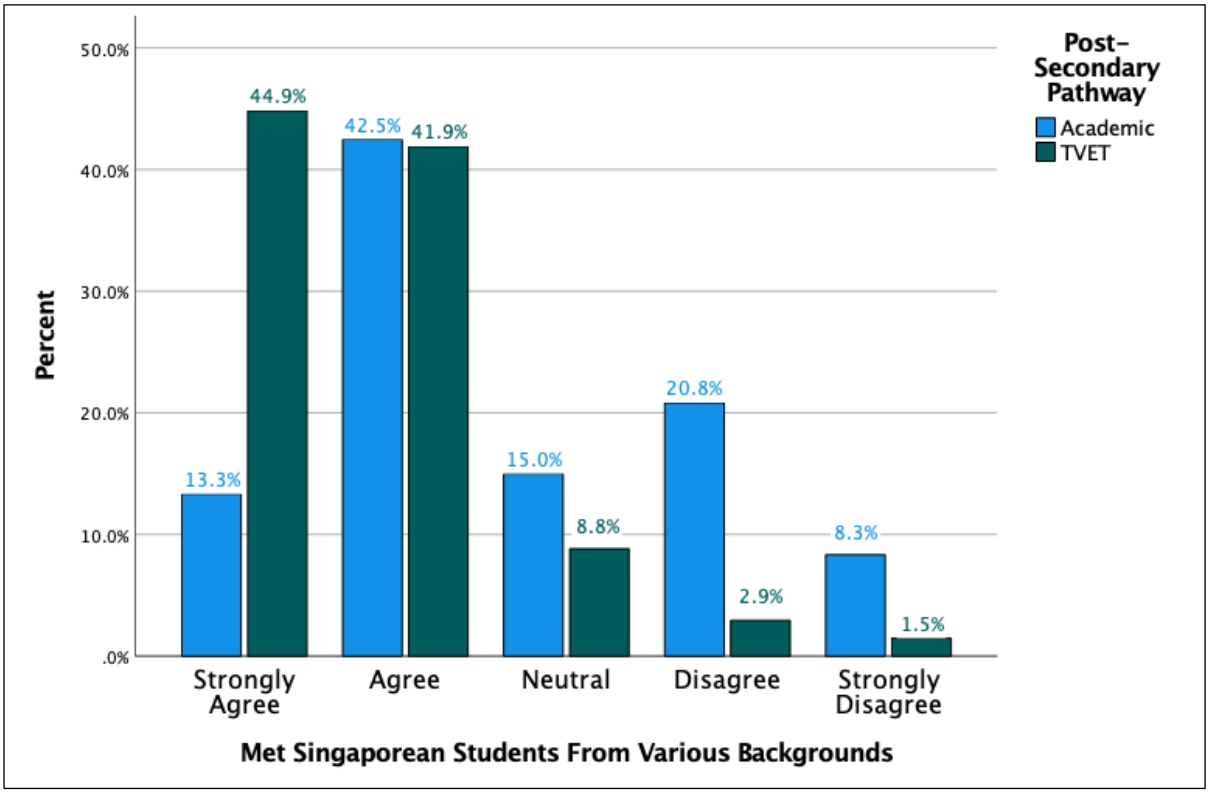


Figure 8. Survey results for whether students met Singaporean students from various backgrounds during post-secondary education.

As cosmopolitan encounters involve both international and local groups of people, 42.5% of academic students agreed and 44.9% of TVET students strongly agreed that they met Singaporean students from various backgrounds. The Mann-Whitney U-test was used to determine whether academic and TVET students differed in their rating of 'met Singaporean students from various backgrounds'. The results showed that the difference was statistically significant, $U(N_{academic} = 120, N_{TVET} = 136) = 4385.50$, z = -6.75, $p < .001$. There were significantly more TVET students (mean rank = 156.25) who strongly agreed that they met a diversity of Singaporean students than academic students (mean rank = 97.05).

Interviewees from the academic pathway agreed that they had met various Singaporeans from various financial backgrounds, with "friends who were from higher-income backgrounds and some friends were from lower-income backgrounds" (22, Academic, Defence). Interviewees also recounted how there were many science stream students taking similar subject combinations of Physics, Chemistry, Mathematics and Economics, which meant that there were "a lot more science stream classes" and the "arts stream will be a lot smaller, a lot more cosy" (25, Academic, Scientific R&D). Entering the science stream was a pragmatic choice because multiple STEM courses at local public universities required

applicants from the academic pathway to have taken certain science subjects. However, this led to limited interactions between students taking different subject combinations due to conflicting class schedules, with those taking less popular subject combinations having to "mingle with different groups of people depending on whether they were free at that time of the day" (22, Academic, Defence).

> Most people do Physics, Chemistry, Math and Econs… because it keeps your options open. For example, I didn't do Chemistry, I wouldn't have been able to do certain sciences [at university]. Even if I did really well for my A-level and wanted to do Medicine, I wouldn't have that option because I didn't do Chemistry[12].
>
> 22, Academic, Defence

Interviewees from the TVET pathway recalled meeting Singaporeans from various financial and family backgrounds. There were friends on "financial assistance" and other friends "who are driving Maserati to school, to Orchard[13] (26, TVET, Consultancy), and there were "people who have good family relationships", while "some people only have a single parent" (25, TVET, Engineering). While some saw this as a positive experience because it's "more reflective of the real world" (30, TVET, Education), others were distressed because it "really brought a whole cluster f**k of new people" (22, TVET, Finance). Yet, TVET students had to socialise and work with a breadth of students because of some compulsory modules and programmes offered by the TVET institutions, which brought together students who were pursuing various diplomas. These inter-disciplinary modules and programmes allowed students to collaborate with others "from Engineering, Food Science and Nutrition, Perfumery and Cosmetics Science… Business student was useless" (21, TVET, Design). Despite the challenges of learning alongside Singaporeans from different backgrounds with different perspectives, these diverse encounters were described as a "defining part" of post-secondary education because they were "learning to work with people I wouldn't have otherwise worked with" (21, TVET, Design).

> I didn't do it by choice. It was part of the [name of Poly programme]. So I did it. *Vomit sounds* Gross… There was a mix between the different faculties. It was Business kids and Design kids and all that.
>
> 25, TVET, Arts

[12] Some science or STEM-based degrees at local universities require applicants from JCs to have taken certain subjects for the GCE A-level examinations. This includes degrees like Medicine and Computer Science.
[13] Main shopping district in Singapore.

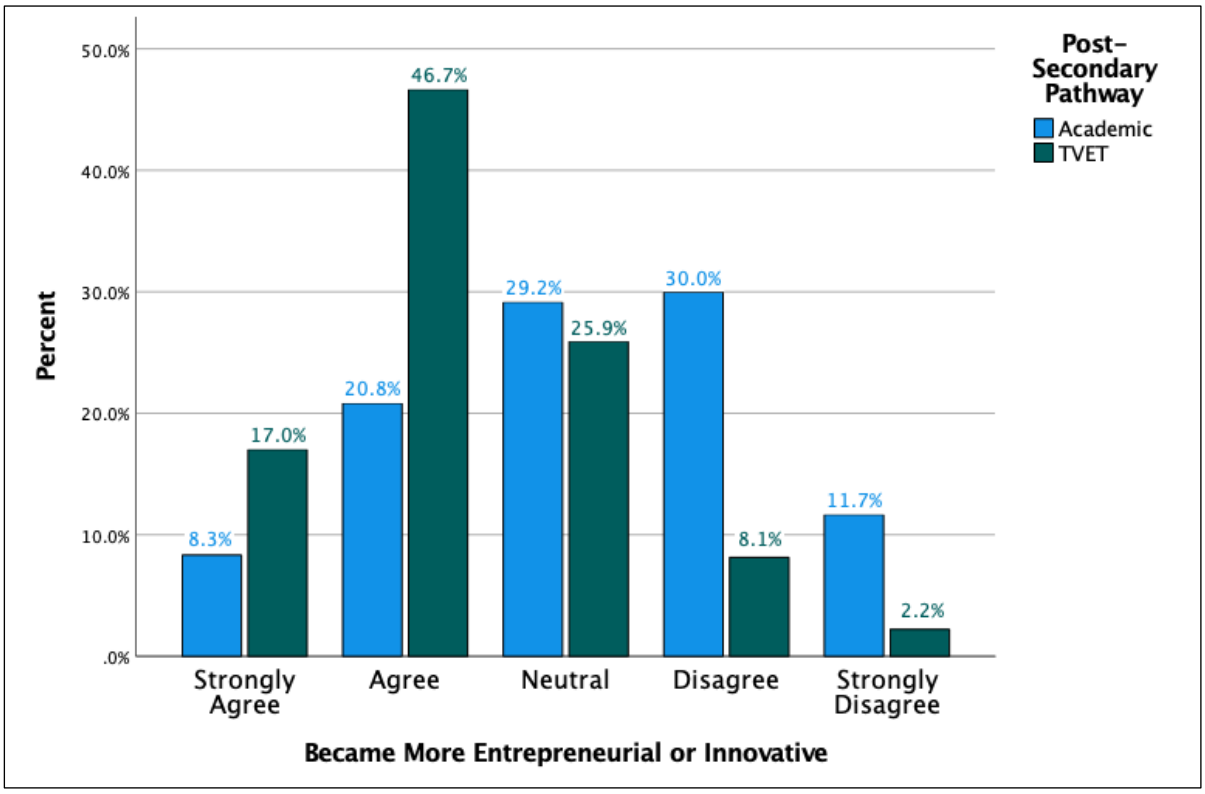


Figure 9. Survey results for whether respondents became more entrepreneurial or innovative during post-secondary education.

Regarding the development of an entrepreneurial spirit, 30% of academic students disagreed and 46.7% of TVET students agreed that they became more innovative during post-secondary education. The Mann-Whitney U-test was used to determine whether academic and TVET students differed in their rating of 'became more entrepreneurial or innovative'. The results showed that the difference was statistically significant, $U(N_{academic} = 120, N_{TVET} = 136) = 4797.00$, z = -5.90, $p < .001$. There were significantly more TVET students (mean rank = 153.23) who agreed that they became more innovative as compared to academic students (mean rank = 100.48).

For TVET students, "that's mainly the buzzword – entrepreneurial" (21, TVET, Design), with innovation being an integral part of the grading of their modules and coursework. Interviewees could recall a range of methods used to test for innovation, whether it be through blueprints, samples or presentation materials. TVET students also drew inspiration from industry practices to develop an entrepreneurial spirit since there were "a lot of opportunities to work with industry leaders and business enterprises" (23, TVET, Social Services). This made TVET students more focused on excelling in their coursework as their projects could lead to direct industry applications, whereby students could "start your own small business if it pans out", especially for those who "actually had funding" from the various corporate leaders or companies that they worked with (21, TVET, Design).

> We came up with our own application where people can start lending electronics to one another. For example, if I need a polaroid for today, I can borrow it from someone else instead of generating more waste and buying a Polaroid.
>
> 23, TVET, Social Services

The focus on getting a good grade was a common theme amongst interviewees from the academic pathway, whereby "you don't really give yourself the space to be more creative or to try and approach things from a different angle" (22, Academic, Defence). This meant that "the general climate isn't one where they reward students for being entrepreneurial or innovative" (26, Academic, Public Administration) and students who attempted to apply creative thinking may face pushback and be advised otherwise because "Why are you trying to be complicated?… You stick to this tried-and-tested method, you will get an A" (31, Academic, Consultancy).

There was, however, one space carved out in the curriculum for students to practice entrepreneurship and innovation: Project Work. This was a compulsory subject that required students "to come up with an idea in a group to solve a societal problem so yeah, you get to be creative" (25, Academic, Scientific R&D). These societal problems can range from local to global contexts. However, to meet the objective of attaining a high grade, academic students may refer to the given marking criteria and "I was just like, oh! So I can do it this way, if I do it this way, I will score more" (22, Academic, Health Services). As such, despite there being a subject for innovative thinking, there were times when the ideal of entrepreneurship would give way to the main priority of getting a good grade.

4.2 Aspirations in the Global City

Having covered experiences in post-secondary education, this section shares findings on Singaporean students' university and career aspirations by post-secondary pathway. Based on the online survey results, Table 3 shows what percentage of academic and TVET respondents had their aspirations influenced by educational factors.

Educational Factors That Shaped Aspirations				
	Academic (n = 120)	TVET (n = 135)	X^2 (df=1)	Asymp. Sig. (2-tailed)
Classmates or schoolmates	30.8%	34.1%	.30	.581
Co-curricular activities	25.0%	22.2%	.27	.602
Grades	75.0%	60.7%	5.88	.015*
Internships or industry placements	7.8%	21.5%	9.79	.002**
Modules or subjects	73.3%	74.1%	.02	.893
School advisors or counsellors	17.5%	11.1%	2.14	.144
Teachers or lecturers	25.0%	25.2%	.00	.973
Others	17.5%	4.4%	11.44	<.001***

Table 3. Survey results for educational factors during post-secondary education that shaped students' aspirations. Respondents could select all that applied.

The top two factors that influenced aspirations were the same for both academic and TVET students: grades and modules or subjects. Pearson's chi-squared test was used to determine whether these factors varied by post-secondary pathway and there were statistically significant results for the following factors with more academic students as compared to TVET students: grades, and education – others. There were also statistically significant results for the following factors with more TVET students as compared to academic students: internships. These results will be used when sharing the findings for the university and career aspirations of Singaporean students.

4.2.1 University Aspirations

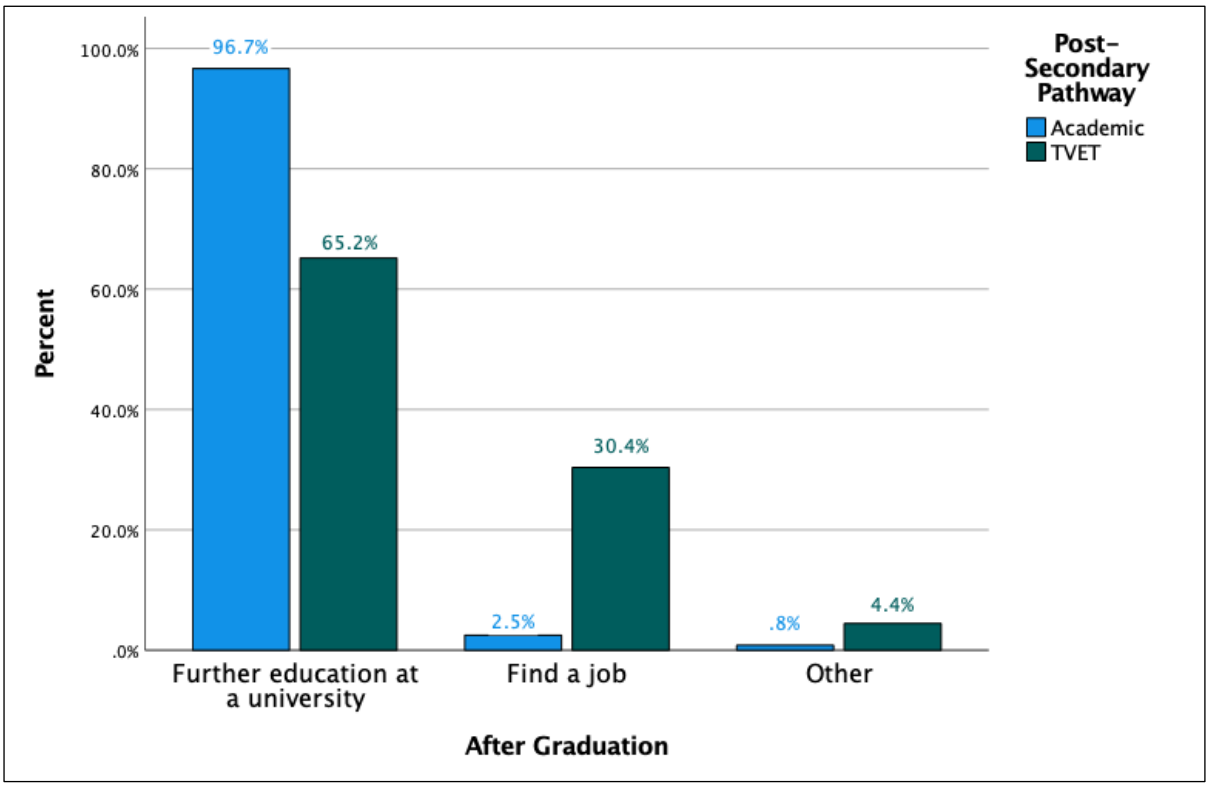


Figure 9. Survey results for what Singaporean students did after post-secondary education.

The majority of academic and TVET students went on to further education at a university, with slightly under one-third of TVET students finding a job. Pearson's chi-squared test was used, and the statistical hypothesis (H_0) was as follows: students' choices after graduating from post-secondary education will not differ significantly by post-secondary pathway. The results showed that choices after post-secondary education significantly differed by post-secondary pathway, X^2 (2, N = 255) = 39.49, p < .001, and the null hypothesis was rejected. The residuals indicated that there were more academic students who furthered their education at a university after graduation and more TVET students who found a job after graduation. This general trend agrees with how for students in the academic pathway, "going to university is what everyone does" (26, Academic, Public Administration), while for TVET students, "some of them straight up started working… in Koei and Bandai, all like the Japanese companies" (27, TVET, Arts).

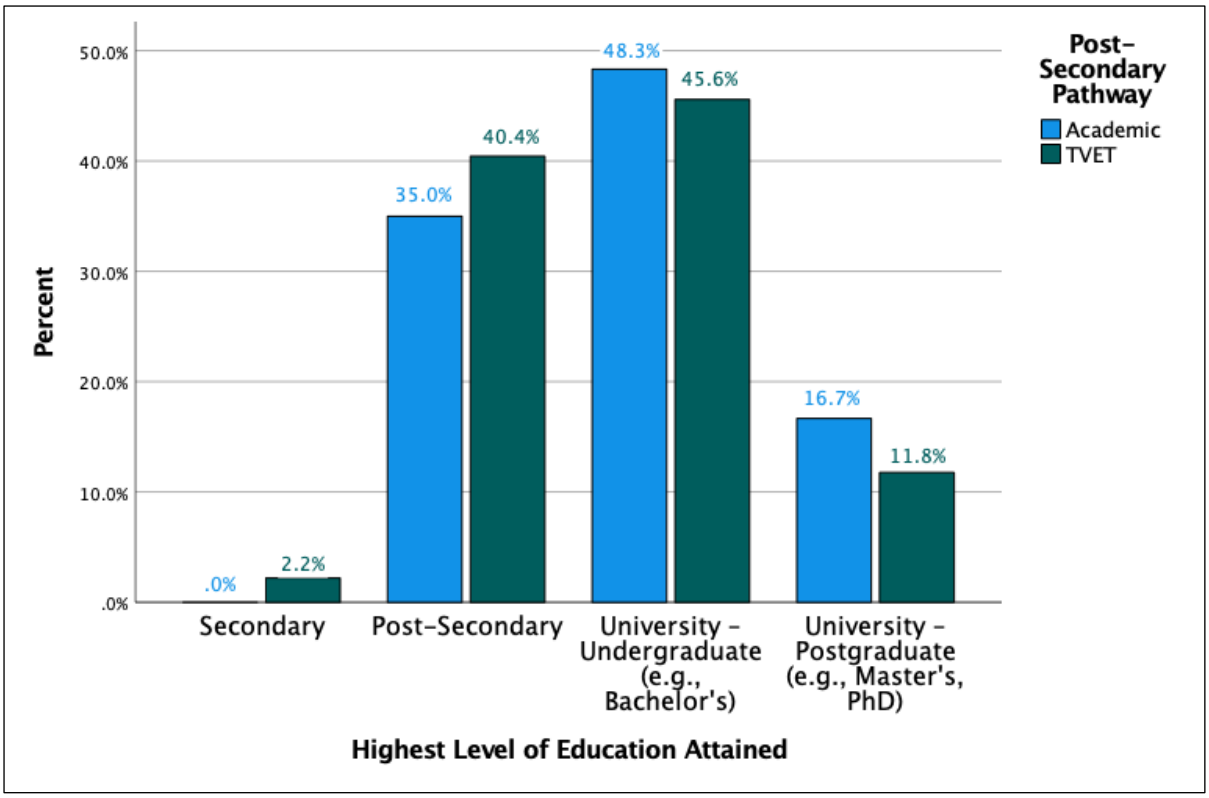


Figure 10. Survey results for the highest level of education attained.

However, there was little evidence of a difference in the highest level of education attained with respondents from both the academic and TVET pathway having broadly comparable answers. Pearson's chi-squared test was used to determine whether students' highest level of education attained would differ significantly by post-secondary pathway. The results showed that there was no significant difference by post-secondary pathway, X^2 (3, N = 256) = 4.34, p < .227. TVET interviewees emphasised that it was not about *whether* vocational students would pursue a university education, but *when*. For some, taking a "gap year" was considered "a very common thing among my circle" (23, TVET, Social Services), but others "might go out to work a couple of years just because [they are] financially struggling" (32, TVET, Finance).

Additionally, for admissions into the science- or STEM-based local university courses, TVET students were competing against academic students from the science stream. As such, TVET students would often change their field of studies, with interviewees recalling how "a lot of them did a completely different major from what they did in Poly", such as switching from science- or STEM-based diplomas to degrees in accounting or finance (23, TVET, Social Services). Furthermore, if, for example, a student with a Chemical Engineering diploma couldn't get into the same field for their degree, they would "change to Material Engineering, Physics, and they will go other engineering" because "they just *die*

die[14] want to get into uni" (25, TVET, Engineering). This allowed TVET students to meet their aspirations for a university degree and contributed to the relatively similar levels of academic attainment between the academic and TVET pathways.

> A lot of my friends that did science courses in Poly did not end up in any science field… actually, all three of my best friends that did science in Poly went to business or accounting.
>
> 32, TVET, Finance

This blurred the distinction between the pre-university academic pathway and the career-oriented TVET pathway because "I realized that you don't need to go JC to be able to go to university" (32, Academic, F&B). Yet, as "everyone assumes that I've gone to JC because I'm doing a PhD" (30, TVET, Education), general societal views have yet to catch up with recent trends of how *both* academic and TVET students were pursuing university degrees (Table 4).

List of University Choices				
	Academic (n = 120)	TVET (n = 128[a])	X^2 (df=1)	Asymp. Sig. (2-tailed)
Local University				
Local Public Universities (e.g., NUS)	80.0%	56.6%	15.63	< .001***
Local Private Universities (e.g., LASALLE)	12.5%	34.9%	17.03	< .001***
Overseas University				
Top Overseas University (e.g., Harvard)	43.3%	16.3%	21.96	< .001***
Other Overseas Universities	45.0%	34.9%	2.66	.103

Table 4. Survey results for university choices by post-secondary pathway. Respondents could select all that applied.

a. Eight students were excluded as they left this section blank despite stating that they had completed either undergraduate or postgraduate education.

When applying to universities, most academic students (80%) and over half of TVET students (57%) had a choice of local public universities. The next popular choice for academic students was between other overseas universities (45.0%) and top overseas universities (43.3%), while the next popular choice for TVET students was between local private universities (35.2%) and other overseas universities (35.2%). The next popular choice for both pathways seemed unclear as the percentages were close. Pearson's chi-squared test was used to test whether students' choice of local public universities differed significantly by post-secondary pathway. The results showed that students that had a choice of local

[14] Singlish phrase that means certainly or definitely (Lee, 2014).

public universities differed significantly by post-secondary pathway, X^2 (1, N = 248) = 15.05, p < .001. The residuals indicated that there were more academic students who aspired to go to local public universities. Pearson's chi-squared test was also used to test whether students' choice of local private universities differed significantly by post-secondary pathway. The results showed that students that had a choice of local private universities differed significantly by post-secondary pathway, X^2 (1, N = 248) = 17.33, p < .001. The residuals indicated that there were more TVET students who aspired to go to local private universities.

Academic interviewees generally shared that there was "almost an unspoken kind of assumption that the average student will be good enough for the local universities" (30, Academic, ICT). However, TVET students stressed that graduating with an above-average grade was not enough to guarantee admissions into local public universities, as an interviewee recounted how they "got a 3.65/4.0, but I still couldn't get into [NTU] Wee Kim Wee" (25, TVET, Arts).

23, TVET, Social Services:	My GPA was about 3.5/4.0. It doesn't allow me to go to NUS.
Author:	That's a really good grade. That's an A, right?
23, TVET, Social Services:	Kind of. But you know, when you go to Poly, it's a bit harder. You need at least 3.7 or 3.8.

Due to the grade requirements, some TVET students described that they "couldn't be a***d to apply to NUS and NTU" since their "chances were very slim" (32, TVET, Finance). As such, local private universities in Singapore, such as LASALLE or RMIT, was an alternative option for TVET students. However, local private universities were seen as the less prestigious option, whereby some "could not find a job" because they were "plainly average when you're facing competition from the Ivy Leagues around the world, NUS and NTU" (27, TVET, Advertising). This is where the interviewees revealed another strategy to avoid settling for a local private university degree. They went abroad.

> There are many Singaporeans that take it as a nice holiday studying overseas. They're travelling all the time. To me, it was my one last shot in life to prove to myself that I wasn't stupid. So I was so busy studying that I emerged the top in my cohort.
>
> 27, TVET, Advertising

When analysing the responses for overseas universities, Pearson's chi-squared test was used to test whether students' choice of top overseas universities differed significantly by post-secondary pathway. The results showed that students that had a choice of top overseas universities differed significantly by post-secondary pathway, X^2 (1, N = 248) = 21.62, p < .001. The residuals indicated that more academic students had a choice of going to top overseas universities. Pearson's chi-squared test was also used to

test whether students' choice of other overseas universities differed significantly by post-secondary pathway. The results showed that there was no significant difference by post-secondary pathway, X^2 (1, N = 248) = 2.50, p = .114.

Academic interviewees mainly listed the UK as the main overseas destination for academic graduates, with other destinations being Australia, China, South Korea, or the US. The interviewees recalled a personal desire to leave behind their "pressure-cooker" and "stressful" academic environment for overseas universities where there was "more of a focus on understanding and enjoying the process of learning" (22, Academic, Finance). The process of studying abroad also helped academic students gain cosmopolitan capital or a sense of global citizenship, which their former institutions may not have provided.

> Because I was in a very homogeneous school, I was still quite closed-minded when I came to uni overseas. I still had certain perceptions of things that were taboo and things that weren't taboo. Then when I came here, I was like, maybe I could have been a bit more open-minded.
>
> 22, Academic, Defence

Person's chi-squared test also showed a statistically significant difference between post-secondary pathways for 'Others' X^2 (1, N = 255) = 11.44, p < .001, with more academic students than TVET students (Table 3). Through the open-ended question in the survey and the interviews, 'Others' was mainly attributed to the higher education talks. Held at least once a year, JCs would invite representatives from local and overseas universities and government scholarship organisations, who would impart knowledge of certain university courses or extend funding opportunities. Additionally, these events consisted of "alumni sharing sessions" to share more about "how life has been for them overseas so that we could feel that this wasn't exactly a strange route to take" (25, Academic, Scientific R&D). This created a "priming effect where prestigious universities like Oxford and Cambridge are naturally within your grasp", which added to "your worldview" of top overseas universities to apply to (30, Academic, ICT). However, academic interviewees stressed that the knowledge of overseas universities and state-sponsored scholarships further emphasised the importance of getting good grades, especially "these London unis, they are quite selective when deciding which students to take in" (22, Academic, Finance). As listed in Table 3, this contributed to how grades (75.4%) represented the highest educational factor that shaped the future aspirations of academic students.

TVET interviewees listed Australia as their peers' most popular destination for university education. As some "didn't want to go to Australia because it was too mainstream" (25, TVET, Advertising), other destinations included South Korea, the UK and the US. However, for TVET students, pursuing a university education abroad was mostly an independent endeavour, with some hiring consultants from

overseas education services like AUG and IDP because “I don't remember our Poly giving us a lot of information actually” (32, TVET, Finance).

> I didn't know what the hell I was doing… throughout my application to the overseas university, I was constantly anxious that my qualifications weren't good enough because it felt like if I went the academic route, I would be more likely to be accepted.
>
> 25, TVET, Advertising

In terms of financial circumstances, academic students had to “find sources of money” to meet their university aspirations, and “there were the scholarship boards coming in to talk about their scholarships” (26, Academic, Public Administration). This provided access to knowledge on state-sponsored scholarships, in particular, alongside higher rates of acceptance into local public universities, which gave academic students both global and local options that alleviated some financial concerns. This contrasted with the lack of access to knowledge of funding opportunities experienced by TVET students. Since about one-third of TVET students indicated overseas universities as one of their choices, it remains unclear how many more might aspire to go abroad with the knowledge of state-sponsored scholarships.

> Honestly, one of the things that frustrated me was that I did not know that there were so many scholarships until I actually went to uni itself – when I talked to my JC peeps and they were telling me about this and that. They already know about it because their JC prepared them... if Poly would have it, it would have been better. Maybe I would be overseas now.
>
> 26, TVET, Consultancy

4.2.2 Career Aspirations

List of Career Choices				
	Academic (n = 120)	TVET (n = 135)	X^2 (df=1)	Asymp. Sig. (2-tailed)
Advanced Producer Services	**21.7%**	**31.3%**	**3.02**	**.082**
Accountancy	2.5%	7.4%	3.16	.075
Advertising	8.3%	18.5%	5.57	.018*
Finance	13.3%	20.0%	2.01	.156
Consultancy	16.7%	8.1%	4.32	.038*
ICT	17.5%	14.1%	.56	.453
Law	8.3%	2.2%	4.90	.027*
Mixed	**29.2%**	**24.6%**	**.67**	**.415**
Non-Advanced Producer Services	**49.2%**	**44.0%**	**.67**	**.413**
Administrative and Support Services	1.7%	3.0%	.47	.495
Arts and Entertainment	9.2%	20.0%	5.88	.015*
Education	18.3%	11.1%	2.67	.102
Engineering	11.7%	16.3%	1.12	.289
Health and Social Services	22.5%	11.1%	5.99	.014*
Hospitality and F&B	0.8%	5.2%	3.96	.047*[a]
Manufacturing	2.5%	2.2%	.02	.884
Public Administration and Defence	19.2%	8.9%	5.67	.017*
Scientific R&D	20.0%	8.9%	6.47	.011*
Transportation and Storage	4.2%	5.9%	.41	.524
Others (e.g., Veterinary Services)	5.8%	8.9%	.860	.354
Total	**100%**	**100%**		

Table 5. Survey results for career(s) Singaporeans are pursuing. Respondents could select up to three.

a. Slight violation as two cells, under academic students, had less than five expected counts.

Respondents could choose up to three careers to account for those working multiple jobs, working across different sectors, or considering various career aspirations. If all three of a respondent's career choices fell within the advanced producer services category, the respondent would be deemed as pursuing a career in advanced producer services, and vice versa for non-advanced producer services. If a respondent selected careers in both categories, they would fall under the 'Mixed' category. 21.7% of academic students and 31.3% of TVET students were pursuing careers in advanced producer services. Pearson's chi-squared test was used to determine whether students' career aspirations for advanced, mixed, or non-advanced producer services careers would differ significantly by post-secondary pathway. There was no significant difference for advanced producer services, X^2 (1, N = 254) = 3.02, p

< .082, the mixed category X^2 (1, N = 254) = .67, p < .415, and non-advanced producer services X^2 (1, N = 254) = .67, p < .413.

As mentioned in the research design section, these careers paralleled the official list of industries in Singapore, as reflected in the 2020 Singapore Standard Industrial Classification, which explained why some careers, like health and social services, were grouped together (Ministry of Trade & Industry, 2020). The top three career aspirations for academic students were in health and social services (22.5%), scientific R&D (20.0%), as well as public administration and defence (19.2%). The top three career aspirations for TVET students were in the arts and entertainment (20.0%), finance (20.0%), as well as advertising (18.5%). Pearson's chi-squared test was used to determine whether students' specific career choices would differ significantly by post-secondary pathway. The results will be presented in the following paragraphs. However, overall, with eight of the 17 career choices having statistically significant results, to a certain extent, it can be argued that experiences in post-secondary education have shaped career aspirations.

The results for Pearson's chi-squared test showed that students' career aspirations were significantly associated by post-secondary pathway for health and social services, X^2 (1, N = 255) = 5.99, p = .014, as well as scientific R&D, X^2 (1, N = 255) = 6.47, p = .011. The residuals indicated that there were more academic students who had career aspirations in health and social services, as well as scientific R&D. Interviewees in the academic pathway shared that their professional pursuits were met with much competition from their peers in the science stream, whereby there was a "huge demand for spots in Medicine", as well as "Pharmacy – they call it the place where Medicine rejects go to" (26, Academic, Public Administration). The high levels of competition in science- and STEM-based careers led TVET students who had diplomas in similar fields to alter their career aspirations, whereby "these students usually and always go into the finance sector... Singapore is a financial hub so lots of jobs for them" (32, TVET, Finance). As TVET students with business diplomas would similarly go on to pursue careers in finance, this explained why there was a high percentage of TVET students with career aspirations in finance (20%) (Table 3).

The results for Pearson's chi-squared test also showed that students' career aspirations were significantly associated by post-secondary pathway for public administration and defence, X^2 (1, N = 255) = 5.67, p = .017. The residuals indicated that there were more academic students who had career aspirations in public administration and defence. These were mainly contributed by the state-sponsored scholarships, which supported academic students in their university education, and thereafter, they had to return to work in Singapore's public sector for four to six years as part of their bond. It should be added that careers in the public sector also went beyond public administration and defence to include those in health and social services, education, and scientific R&D. As it was more common for academic

students to take on state-sponsored scholarships, this contributed to the lower percentage of academic students in advanced producer services compared to TVET students. However, for academic and TVET students who were not bonded to the public sector, they could explore career choices beyond Singapore or in MNCs, having to "just ignore all of them that went to government" and realising that "all the private sector ones – what did they do? They went overseas." (31, Academic Consultancy).

> This is the cream of the crop who will come back and serve Singapore society, with their international perspectives and all these skills that they've learned overseas, right? Those of us that got away, who are not bonded, and deemed Poly students – whatever – the government don't care about us. We don't have a bond.
>
> 32, TVET, Finance

Without the pressure to attain high grades for applications to top overseas universities or scholarships, TVET students were thus less concerned about getting the 'highest possible grade', which may explain the statistically significant difference between post-secondary pathways for grades (6.63, p=.010) (Table 3). Additionally, "in terms of why grades are not as important, I would say that passion plays a big part" and "as long as they get to do something that they love", they were more willing to work across various geographical contexts (26. TVET. ICT). As such, TVET interviewees shared how they gained career opportunities while studying abroad or were hired by MNCs after graduating from a local university. This included being recruited to work at "Comic Con" in the US, as well as a "freelance project with BBC" (27, TVET, Arts), and for others, they referred to how "Deloitte and all these big 4s are willing to hire Poly people" (27, TVET, Advertising).

4.3 Roles in the Global City

4.3.1 Government Leaders and Corporate Executives

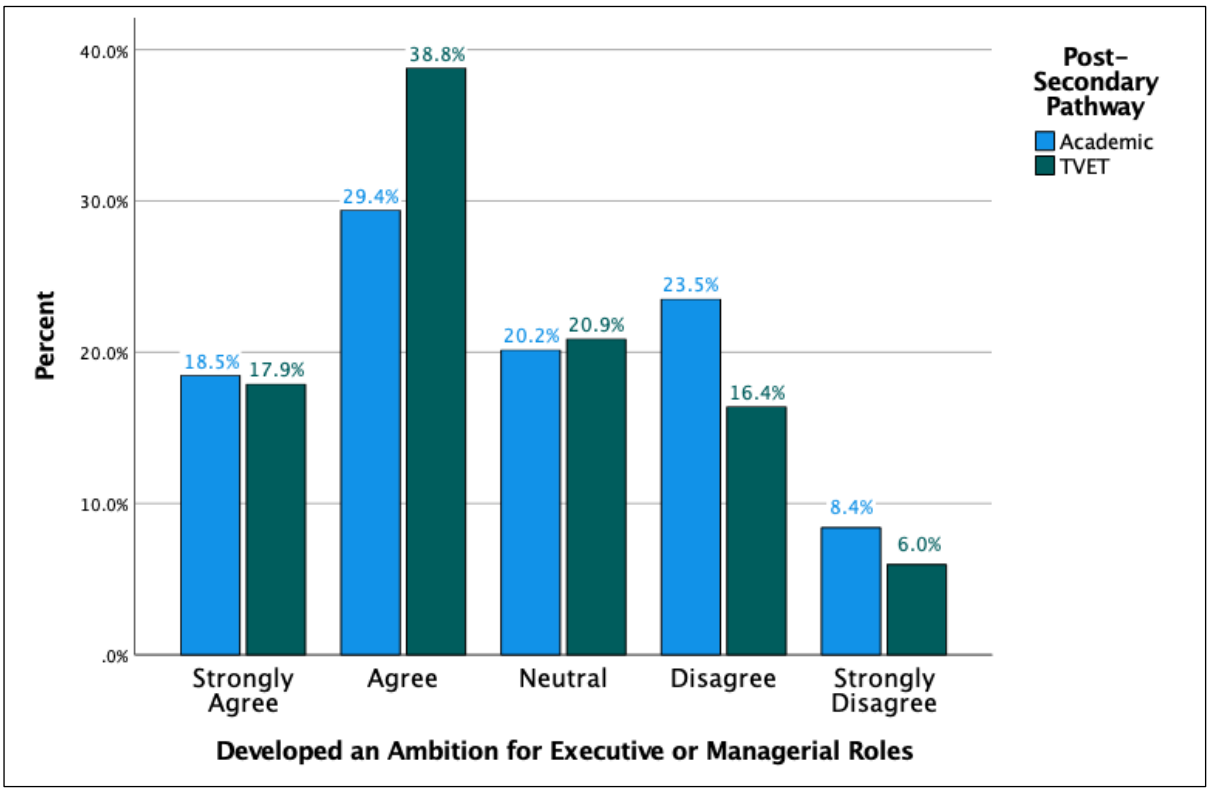


Figure 11. Survey results for whether Singaporean students had developed an ambition for executive or managerial roles during post-secondary education.

In terms of ambitions for leadership roles, 29.4% of academic students and 38.8% of TVET students agreed that they developed an ambition for executive roles during post-secondary education. The Mann-Whitney U-test was used to determine whether academic and TVET students differed in their rating of 'developed an ambition for executive or managerial roles. The results showed that the difference in ratings between academic students (mean rank = 122.93) and TVET students (mean rank = 133.42) was not statistically significant, $U(N_{academic} = 120, N_{TVET} = 136) = 7964.00$, z = -1.17, $p = .243$.

Interviewees from the academic pathway mainly emphasised pursuing executive roles in 'prestigious' or 'respectable' careers, and with many of their peers "having a goal of being a doctor, lawyer, engineer or being a government scholar" (21, Academic, Public Administration). Besides careers in law, the focus was on positions in non-advanced producer services, like healthcare and scientific R&D, and professional success was confined to a specific set of careers, a proportion of academic students would go on to take degrees and pursue careers revolving around non-advanced producer services.

> From the kinds of universities they push you to, and the kinds of degrees they push you to study, and them educating you about the various career choices that are available in life, also very focused on STEM or you know – doctor, lawyer, engineer kind of route. So, it at least pushed me to think that's how I succeed in life.
>
> 23, Academic, Finance

Within the set of careers listed, it was executive roles in the public sector that received the most attention, with interviewees recounting how they were taught that "Singapore wants its people to want to play a part in building the country up" (25, Academic, Scientific R&D). TVET students themselves recognised a general trend, describing their academic counterparts as "scholars – doesn't matter what kind of scholars – they will definitely be part of the government" where "most of them will definitely be playing key roles" (27, TVET, Arts). For example, one interviewee was "most interested in Singapore smart city plans", with a personal desire "to progress on to more strategic roles" (21, Academic, Public Administration).

On the other hand, TVET interviewees focused less on 'executive roles' and were more focused on traits linked to 'ambition', such as faith, morality or 灵感 [ling gan], that would possibly take them beyond Singapore. This was not to say that TVET students were not aspiring toward executive roles, but they were concerned about how to get there as it's "a lot on morality and ethics… who you are as a person will really determine whether you want conventional or unconventional success" (30, TVET, Education). This contrasted with the academic pathway, with career aspirations being more varied because "the [TVET] system, in general, is a very open-ended system… there isn't a set pathway that they impose on people" (26, TVET, Consultancy). There was also a geographical contrast to look at roles beyond the city-state as the TVET "experience really pushed you into looking at bigger things, interactions with people and overseas opportunities" (23, TVET, Social Services), and an interviewee put their ambitions quite succinctly: "the world is your oyster" (26, TVET, ICT).

> ITE has done such a good job man, and this only happened in the past decade. Really skills beyond books. You have a lot of chefs, you have a lot of cosmetic people, entrepreneurs. People who go from ITE to Poly or ITE into the workforce. Chinese people call it '灵感'.
>
> 25, TVET, Arts

As such, while academic students were generally considering executive roles in the public sector, TVET students were considering executive roles both within and beyond Singapore. There is thus a possible area of discussion on how the global city requires both government leaders and corporate executives to thrive, which agrees with the literature review (see Sassen, 1991; Ong, 2011).

4.3.2 Global Citizens

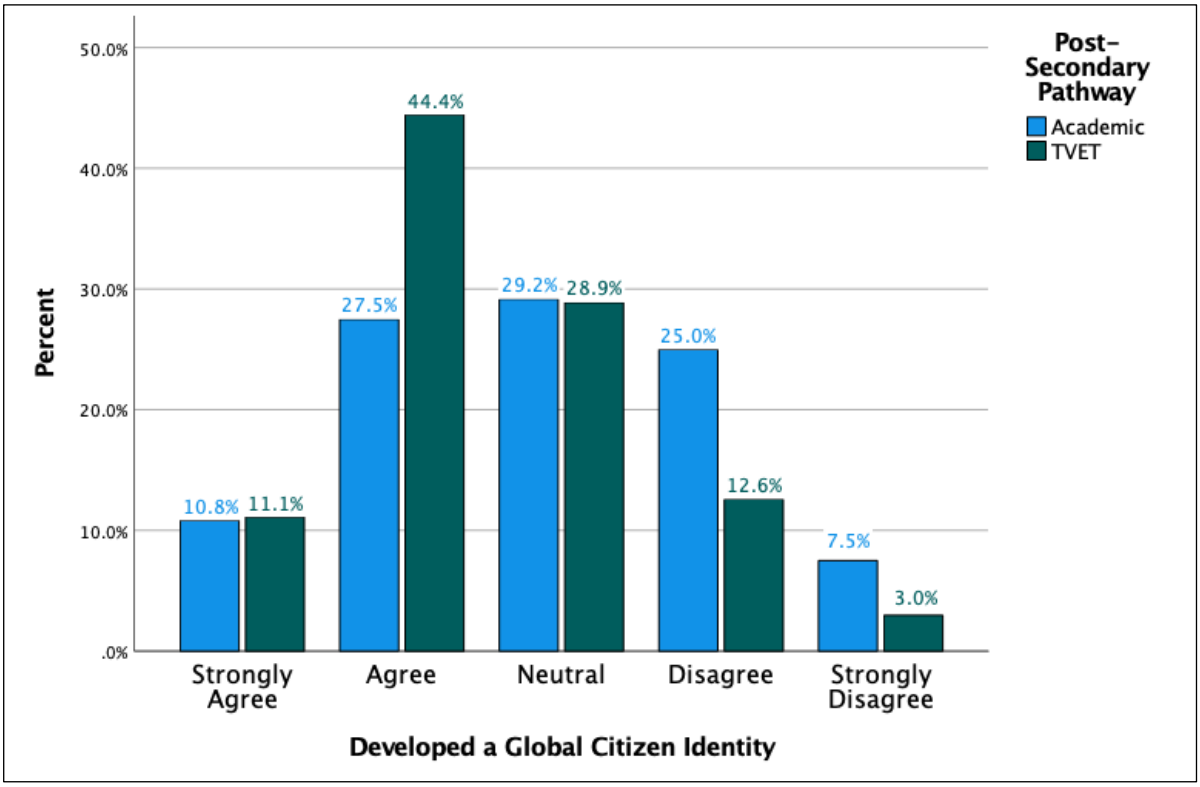


Figure 12. Survey results for whether students developed a global citizen identity during post-secondary education.

In terms of becoming a global citizen, 44.4% of TVET students agreed that they developed a global citizen identity and 29.2% of academic students were neutral about whether they developed a global citizen identity. The Mann-Whitney U-test was used to determine whether academic and TVET students differed in their rating of 'developed a global citizen identity'. T The results showed that the difference was statistically significant, $U(N_{academic} = 120, N_{TVET} = 136) = 6558.00$, z = -2.83, $p < .005$. There were significantly more TVET students (mean rank = 140.28) who agreed that they became more of a global citizen as compared to academic students (mean rank = 115.15).

For TVET students, doing their coursework abroad or their internship in an MNC was described as a "defining point" as they realised that "the world is huge and we're not just confined to Singapore" (26, TVET, ICT). Beyond learning about the world through their coursework and projects, TVET students had to physically navigate various geographies and cultures, which included "this homestay with an Indonesian farmer", where there was "no hot water and it's up in the mountains and the toilets are just squatting toilets" (21, TVET, Design). It was through these global experiences that TVET students navigated their place in the world as global citizens.

For academic students, the emphasis on grades hindered their ability to fully appreciate the taught curriculum that sought to impart global knowledge "became I'm just structuring my answer to suit what is correct" (32, Academic, F&B). The purpose of doing readings, writing essays, and taking tests were " to do well in this paper and not because I wanted to connect better with the world" (22, Academic, Health Services). It came to a point whereby students would "come up with essay plans and memorize them" so that they could "just get the marks" (22, Academic, Defence). Overall, the taught curriculum was seen as providing a textbook manual on how to view and engage in global settings, and it was only when "I started working, as I started meeting new people from various walks of life, I realized that my thinking was so narrow, it was very limited" (32, Academic, F&B).

Yet, interviewees from both pathways spoke of a 'Singapore Dream' that persisted in modern Singapore society, which was to get into a local university like NUS and NTU, and thereafter, find a job and settle down in Singapore. This 'Singapore Dream' was described as "this standard life road map of, ok, I'm gonna graduate from a local university, find a good job that is within the country and I'm gonna settle down" (26, TVET, ICT). As such, the academic pathway remains the easiest way to achieve this Singaporean ideal, as an academic interviewee admits that "it was really just for the certificate. It was really just the direct way of going through the Singapore Dream", whereby "I didn't study science because to heal people, or to create something that can help the world. I study because I can score well" (32, Academic, F&B). However, this Singapore Dream works well for talent retention by ensuring the 'brightest' portion of a student cohort gained access to local public universities and thereafter contributes to the Singapore urban economy, whereby "everything is geared back to Singapore in the end – Singapore's success and Singapore's stability" (22, Academic, Defence).

At this point, there was a realisation that the Singapore "landscape is too small for the amount of talent the country is providing" (32, TVET, Finance). This means that "for junior college students, there is an emphasis on keeping them in Singapore," but "in terms of ITE and Poly… there doesn't seem to have that worry that they will leave" (23, TVET, Social Services). TVET interviewees could recall a growing number of peers who were going abroad for work as "[name] is in San Francisco, [name] is in Korea, [name] is in Florida" (25, TVET, Arts). To "take advantage of the fact that Singapore is a global city and we can go anywhere we want" (25, TVET, Advertising), there has emerged a new generation of TVET students who were considering university and career opportunities abroad.

> Personal ambition is just mostly trying to save up as much as possible because I know that I would not want to stay in Singapore for long. I will want to work in other companies, bigger companies, in the US – Blizzard. All the other big companies in Canada. Everywhere.
>
> 27, TVET, Arts

It should be added that there was, however, a proportion of academic students who were thinking beyond studying at local universities and settling down in Singapore, having recognised that "how academically rigorous the education system really helped you get ahead in the corporate environment" (23, Academic, Finance). It was a personal recognition that "the Singapore job market is a global market", with there being global firms like those in consultancy, finance and law (31, Academic, Consultancy). This was an important revelation for academic students, as well as TVET students, who were actively redefining the Singapore Dream through their endeavours because if "you just blindly follow the path and then you will suffer, feel d**n miserable" (25, TVET, Engineering). These students were playing an important role in accelerating Singapore's transformation into a global city, which educates a cosmopolitan and entrepreneurial citizenry to supply the diverse economic sectors, especially the advanced producer services.

5.0 DISCUSSION

My initial hypothesis was that academic students would take on roles as government leaders or corporate executives as they aspire towards overseas universities and careers across various sectors in the urban economy. On the other hand, TVET students would take on roles as technicians or mid-tier professionals as they aspire toward careers in non-advanced producer services, with some going on to pursue a university education. It is now clear that my hypothesis was incorrect. Despite Singapore's top-down education system closely aligning itself to the manpower requirements of the urban economy, the findings revealed that the aspirations and roles of academic and TVET students in Singapore did not reflect what was found in the available macro-level studies. The pressure amongst academic students to take on state-sponsored scholarships and be future government leaders, as well as the ambition amongst TVET students to pursue global higher education and career opportunities unveiled no 'hierarchy' between the pathways, but simply everyday Singaporeans who were figuring out their best options and navigating the complexities of being in a global city.

5.1 Rigor and *Rabak*

Academic students had relatively sheltered and localised experiences during post-secondary education that offered them opportunities to rise to the higher echelons of the public sector. Describing their pathway as stressful and rigorous, academic students had a common objective of attaining the highest possible grades and state-sponsorship scholarships that would help them get into the best universities in Singapore, and around the world. They were deemed as the brightest of their cohort, with the intellectual capacities to steer the future of the Singapore urban economy. In reference to Campbell (1979), Pring, (2015, p. 166) argued that the more quantitative indicators are used to measure educational success, such as through the use of A-level grades or internal school rankings, "the more apt it will be to distort and corrupt the social processes it was intended to monitor". This was exemplified through the academic pathway's instrumental view of education, whereby despite attempts to impart global knowledge through General Paper and creative thinking through Project Work, academic students were less engaged with the learning processes and more concerned with meeting the criteria to obtain the best grades for their subsequent university and scholarship applications. The rigour that academic students went through, although key to the development of an impressive portfolio, neglected key aspects of the global city experience, such as opportunities to engage with international students or practice entrepreneurship. Thereafter, academic students aspire toward local public universities or top overseas universities in the UK, especially when the latter was supported by state-sponsored scholarships that had a five- to six-year bond in the public sector. Their top career aspirations also revolved around those in non-advanced producer services like health and social services, scientific

R&D, as well as public administration and defence, with them having an ambition for roles as government leaders to serve the local population.

The aspirations and roles of TVET students were shaped through relatively fun and 'rabak' (read: messy or varied) experiences as they had to figure out their own paths to and definitions of success in Singapore, and around the world. Having gone on overseas trips, met various international and Singaporean students, as well as practised entrepreneurship in their coursework, TVET students were exposed to a wider set of possible university and career options, with the world as their playing field. Additionally, due to the competitive grade requirement to enter local public universities, over a third of TVET students aspired to study at overseas universities, particularly those in Australia, especially due to the low sense of prestige tied to attending a private university in Singapore. TVET students were thereafter more likely to pursue careers in advanced producer services like finance and advertising, and even those in arts and entertainment went on to work abroad due to the limited opportunities in the creative economy in Singapore. Having described their TVET experience as 'rabak' or open-ended, it was the autonomy to make their own successes and failures that gave TVET students the ambition to pursue roles beyond that of a 'technician' or 'mid-tier paraprofessional', which may mean pursuing executive roles in MNCs or working overseas. Whether it be academic students who go on to be government leaders or TVET students as corporate executives, the aspirations and roles of Singaporeans from both pathways are shaped in distinct ways and unbeknownst to them, they continue the globalisation of the small but ambitious South-East Asian city-state.

5.2 Between Government and Globalisation

With the high percentage of academic students having a choice of local public universities, alongside opportunities to apply for state-sponsored scholarships, the Singapore government has directed its human capital retention efforts at students from the academic pathway. Keeping in mind that academic students only represent about one-third of the post-secondary cohort and the enrolment rate at local public universities is at 42%, it is more likely that TVET students would have to meet their aspirations for a university education elsewhere. However, since Singapore's transformation into a global city in the 21st century, the low university enrolment rate works to the advantage of TVET students as over one-third of students from the vocational pathway now have the choice of pursuing further education at an overseas university. The quota on university admissions has thus added to a brain-drain of TVET students. If they do choose to return to Singapore, they would be returning with an international portfolio of academic and professional experiences that would aid them in their ambition towards roles as corporate executives in advanced producer service firms, where they would serve a more global clientele.

Based on the current research on post-secondary education in Singapore, this can be seen as an unintended phenomenon in the well-planned and top-down education system. Singaporean students are now not just limited to the system set by the Singapore government, but they are able to explore various university and career opportunities around the world. This is a point of contention between government and globalisation; between a state-led education system and global higher education, as well as the local urban economy and the global talent market. The Singapore education system has to navigate both forces that are shaping the aspirations and roles of post-secondary students, informing them that no, university enrolment is limited, and yes, you may be able to pursue university education abroad. With Singapore's integration into the global economy, it is thus not adequate to say that a state-led education system reigns dominant. If this were the case, TVET students would be settling for roles as technicians or mid-tier paraprofessionals in the urban economy. What is currently happening is that experiences in the TVET pathway have given these students more knowledge of the world and widened their university and career options, especially due to the limited set of aspirations and roles that the Singapore education system has planned for TVET students. Therefore, to some degree, educational governance has given way to the forces of globalisation and the Singapore government may choose to reduce the brain drain by increasing spaces in local public universities. Future studies can also explore how the roles of technicians and mid-tier paraprofessionals, which include careers in manufacturing and nursing, are currently being filled through flexible immigration policies (see Tay *et al.*, 2012; Ang *et al.*, 2020).

5.3 Beyond the Binary of Academic and TVET

Current scholarship on global cities has shed much light on careers in advanced producer services, as well as the role of government leaders and corporate executives in facilitating the globalisation of cities. However, the global city consists of so many other urban sectors, such as those in the arts and entertainment, health and social services, as well as education. Although the limited scholarship of the Singaporean post-secondary system suggests that it is the TVET students who will support non-advanced producer services in the Singapore urban economy, this dissertation shows that this is no longer the case for both academic and TVET students are pursuing careers in non-advanced producer services, despite them diverging in their specific career choices.

This raises an important question on to what extent is the academic pathway still the pre-university or 'prestigious' pathway, especially with the comparable percentages of academic and TVET students who have attained undergraduate and postgraduate degrees. Consideration of the question of pre-university is crucial because of the need for the small city-state of Singapore to maximise its only natural resource that it can export for urban and economic development; highly-skilled human capital. Having transformed from a port city to a global city, the Singapore education system has two main educational strategies, which are to maximise all human capital, as well as align the education system with the

manpower needs of the economy through streaming. These educational strategies are coming into contradiction as streaming puts a cap on students and maximises the potential of one group of students over the other. Furthermore, the education system has created a set of educational tracks for certain vocations, which is a means to effectively *mobilise* human capital, not maximise it. If the education system continues to cap university places and at the same time, encourage all Singaporean students to maximise their potential, tensions will ensue. Future government policies can counter the brain drain of students by moving beyond a traditional two-track perspective of academic and TVET education. All Singaporean students, regardless of academic or TVET background, can play key roles as executives, mid-tier paraprofessionals and technicians. In the process of streaming, students' aspirations and roles from a young age are moulded in a certain way that has inadvertently hindered the maximisation of human capital – Singapore's key natural resource as a city-state – which has led ambitious students to consider academic and professional opportunities abroad.

6.0 CONCLUSION

Education is a key factor in shaping cities. As such, research needs to delve deeper into understanding how educational institutions prepare students for their future in a globalised world. Overall, this dissertation has provided empirical findings to show that in Singapore, there is a divergence of aspirations and roles that occurs from the post-secondary stage onward. The rigorous and *rabak* experiences in post-secondary education have been shown to contribute significantly to students' subsequent university and career aspirations. Yet, each pathway plays a unique role in contributing to the globalisation of Singapore, whether is it through working in advanced producer services or non-advanced producer services, as well as pursuing ambitions toward becoming corporate executives or government leaders.

Amidst the wave of pioneers in research on global cities (see Friedmann, 1986; Sassen, 1991; Beaverstock *et al.,* 1999), there was Rajaratnam (1972, p. 519), who stated that "the trend towards urbanisation is irreversible". Although this dissertation may have provided in-depth findings on a specific urban context – Singapore – by no means is urbanisation unique to this one city. The alignment of education with urbanisation is a broader issue that governments and corporate stakeholders are grappling with, especially against the backdrop of rapid globalisation in the 21 century. Therefore, researchers can contribute to this emerging academic space by engaging in multi-scalar analyses on how education systems can play an important role in globalising our cities.

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APPENDIX A: GLOBAL CITY LEXICON

The figure originally presented here cannot be made freely available via ORA because of copyright.
The figure was sourced at Acuto, M. & Pejic, D. (2021). Shaping a global comparative imagination? Assessing the role of city rankings in the "global city" discourse, *Area*, 53, 247–256.

List of common terms used to describe global cities and their citizens (Acuto & Pejic, 2021).

APPENDIX B: LIST OF POST-SECONDARY INSTITUTIONS IN SINGAPORE

Junior Colleges						
	Name	*Founding Year*	*Type*	*Student Population*	*Special Electives & Programmes*	*Graduating Certificate*
1.	Anderson Serangoon Junior College	2019	Government	1,500	• Language Elective Programme – Tamil	GCE A-level
2.	Anglo-Chinese Junior College	1977	Government-Aided	Unknown	• Drama Elective Programme • Language Elective Programme – English • Music Elective Programme	GCE A-level
3.	Anglo-Chinese School (Independent)	1886	Independent	2,900	• Integrated Programme • Music Elective Programme • Regional Studies Programme	IB
4.	Catholic Junior College	1975	Government-Aided	1,450	• Language Elective Programme – English	GCE A-level
5.	Dunman High School	1956	Government / Autonomous	2,400	• Bicultural Studies Programme • Integrated Programme • Language Elective Programme – Chinese • Music Elective Programme	GCE A-level
6.	Eunoia Junior College	2017	Government	1,250	• Bicultural Studies Programme • Integrated Programme • Music Elective Programme	GCE A-level
7.	Hwa Chong Institution	2005	Independent	4,000	• Art Elective Programme • Bicultural Studies Programme • Integrated Programme • Language Elective Programme – Chinese	GCE A-level
8.	Jurong Pioneer Junior College	2019	Government	1,710	• Language Elective Programme – Chinese • Language Elective Programme – Malay	GCE A-level
9.	Millenia Institute	2004	Government	1,133		GCE A-level
10.	Nanyang Junior College	1977	Government-Aided	1,800	• Art Elective Programme • Language Elective Programme – Chinese	GCE A-level
11.	National Junior College	1969	Government	1,900	• Art Elective Programme • Integrated Programme	GCE A-level

					• Language Elective Programme – Malay • Language Elective Programme – Tamil	
12.	NUS High School of Math and Science	2005	Specialised Independent	1,000	• Integrated Programme	NUS High School Diploma
13.	Raffles Institution	1823	Independent	4,000	• Integrated Programme • Language Elective Programme – English • Language Elective Programme – Malay • Music Elective Programme • Regional Studies Programme	GCE A-level
14.	River Valley High School	1978	Government / Autonomous	Unknown	• Bicultural Studies Programme • Integrated Programme	GCE A-level
15.	School of the Arts, Singapore	2008	Specialised Independent	Unknown	• Integrated Programme	IB
16.	Singapore Sports School	2004	Specialised Independent	500		IB
17.	St Andrew's Junior College	1978	Government-Aided	1,600		GCE A-level
18.	St Joseph's Institution	1852	Independent	2,000	• Integrated Programme	IB
19.	Tampines Meridian Junior College	2018	Government	1,500	• Drama Elective Programme • Language Elective Programme – Malay	GCE A-level
20.	Temasek Junior College	1976	Government	1,800	• Integrated Programme • Language Elective Programme – Chinese • Music Elective Programme	GCE A-level
21.	Victoria Junior College	1984	Government	1,400	• Drama Elective Programme • Integrated Programme	GCE A-level
22.	Yishun Innova Junior College	2019	Government	1,456	• Language Elective Programme – Malay	GCE A-level

List of junior colleges in Singapore (MOE, 2022).

ITE and Polytechnics						
	Name	*Founding Year*	*Type*	*Student Population*	*Faculties / Schools*	*Graduating Certificate*
1.	ITE College Central	2013	Government	• 10,000 (Full-Time)	• School of Business Services • School of Electronics & Info-Comm Technology • School of Engineering • School of Design & Media	• 41 Higher Nitec • 31 Nitec
2.	ITE College East	2005	Government	• 10,000 (Full-Time)	• School of Applied & Health Sciences • School of Business & Services • School of Electronics & Info-Comm Technology • School of Engineering	• 40 Higher Nitec • 34 Nitec
3.	ITE College West	2010	Government	• 8,000 (Full-Time)	• School of Business & Services • School of Electronics & Info-Comm Technology • School of Engineering • School of Hospitality	• 43 Higher Nitec • 36 Nitec
4.	Nanyang Polytechnic	1992	Government	• 13,968 (Full-Time)	• School of Applied Science • School of Business Management • School of Design & Media • School of Engineering • School of Health & Social Sciences • School of Information Technology	41 Diplomas (Full-Time)
5.	Ngee Ann Polytechnic	1963	Government	• 13,000 (Full-Time)	• School of Business & Accountancy • School of Design & Environment • School of Engineering • School of Humanities & Social Sciences • School of Health Sciences • School of Film & Media Studies • School of InfoComm Technology • School of Life Sciences & Chemical Technology • School of Interdisciplinary Studies	39 Diplomas (Full-Time)
6.	Republic Polytechnic	2002	Government	• 14,000 (Full-Time)	• School of Applied Science • School of Engineering • School of Sports, Health and Leisure • School of Management and Communication	36 Diplomas (Full-Time)

					• School of Hospitality • School of Infocomm • School of Technology for the Arts	
7.	Singapore Polytechnic	1954	Government	• 12,747 (Full-Time)	• Media, Arts & Design School • School of Architecture & the Built Environment • School of Business • School of Chemical & Life Sciences • School of Computing • School of Electrical & Electronic Engineering • School of Life Skills & Communication • School of Mechanical & Aeronautical Engineering • School of Mathematics & Science	30 Diplomas (Full-Time)
8.	Temasek Polytechnic	1990	Government	• 14,000 (Full-Time)	• School of Applied Science • School of Business • School of Design • School of Engineering • School of Humanities & Social Sciences • School of Informatics & IT	36 Diplomas (Full-Time)

List of the ITE colleges and polytechnics in Singapore (ITE, 2022b; Nanyang Polytechnic, 2022; Ngee Ann Polytechnic, 2021; Republic Polytechnic, 2022; Singapore Polytechnic, 2022; Temasek Polytechnic, 2021).

APPENDIX C: SURVEY FRONT PAGE AND QUESTIONS

For this survey, post-secondary institutions refer to those you attend after secondary school and before university, such as the Institute of Technical Education (ITE), Junior College (JC) or Polytechnic (Poly).

What is the purpose of this survey?

As part of research for my thesis, this survey aims to explore how experiences in post-secondary education contribute to students' future aspirations and choices in a global city, as well as areas for improvement.

Why have I been invited to take part?

Because you are attending or have graduated from an ITE, JC, Poly or another post-secondary institution in Singapore. You are also between 18 to 35 years old.

How long will it take me?

It should take about 10 minutes to complete this survey. Towards the end, you may indicate your interest to take part in an online interview, which is entirely optional.

What will happen to my data?

All the data collected will be anonymous and it will be stored on Jisc Online Surveys. If you have indicated your interest to take part in a follow-up online interview, your contact information and interview recording will be deemed as personal data and are subjected to the University of Oxford's guidelines to protect your confidentiality. The researcher will make the interview data indirectly identifiable by excluding any personal information, like names or schools, and deleting the recordings after transcription.

The interview data will be stored on an encrypted and password-protected laptop, backed up on OneDrive for Business, and accessible only to the student researcher and supervisor. This research project may be used for presentations, but there will be no way for your answers to be linked to you personally.

How do I go ahead?

This study has received ethical clearance via the University of Oxford Research Ethics procedure. By completing the questions you are giving us permission to use your answers in this research.

If you have any concerns at all, please feel free to contact the student researcher, Joshua Ee (joshua.ee@wolfson.ox.ac.uk). The student researcher will answer any questions regarding data storage,

how quotes will be used or other relevant concerns. You may also contact the supervisor, Dr Ariel Lindorff (ariel.lindorff@education.ox.ac.uk), or the chair of the Department of Education ethics committee, Dr Liam Gearon (liam.gearon@education.ox.ac.uk).

If you consent to this study, please tick the following boxes:

1. [Tick Box] I have read and understood the information about this study.
2. [Tick Box] I understand what the data will be used for and where it will be stored.
3. [Tick Box] I am aware of whom to contact should I have questions or concerns during or following my participation in this study.
4. [Tick Box] I consent to have my data used for this study

Survey Questions

Demographics

1. What is your age?
2. Which post-secondary institution are you attending or did you last attend? Exclude university.
    a. Institute of Technical Education (ITE)
    b. Junior College (JC)
    c. Polytechnic (Poly)
    d. Others:
3. What is the highest level of education you completed?
    a. Secondary
    b. Post-Secondary
    c. University – Undergraduate (e.g., Bachelor's)
    d. University – Postgraduate (e.g., Master's, PhD)
    e. Others:
4. What is your current occupation?

During Post-Secondary Education

5. Do you agree that your experiences in post-secondary education have helped you in the following?
    a. Developed a global citizen identity
    b. Developed interpersonal or cross-cultural communication skills
    c. Developed leadership skills
    d. Developed an ambition for executive or managerial roles
    e. Became more entrepreneurial or innovative
    f. Learnt more about other countries

g. Learnt more about the global economy
h. Met Singaporean students from various backgrounds
i. Met international students from various countries

6. If you could describe your experience in post-secondary education in one or two words, what would it be?

<u>After Post-Secondary Education</u>

7. What will you do or did you do after post-secondary education? Exclude National Service.
    a. Find a job
    b. Further education at a university
    c. Further education at other institutions
    d. Others:
8. When applying to a university, what are or were your choices? Select all that apply.
    a. Local public universities
    b. Local private universities
    c. Top overseas universities (e.g., Harvard)
    d. Overseas universities in big cities (e.g., London)
    e. Others:
9. What kind of career(s) are you pursuing? Select up to 3.
    a. Accountancy
    b. Advertising or Public Relations
    c. Arts or Entertainment
    d. Aviation or Air Transport
    e. Banking or Finance
    f. Consultancy
    g. Education
    h. Engineering
    i. Entrepreneur
    j. Foreign or International Affairs
    k. Health or Social Services
    l. Hospitality or Food Services
    m. Human Resources or Administrative Services
    n. Information and Communications Technology
    o. Land Transportation or Logistics
    p. Law
    q. Manufacturing
    r. Maritime or Shipping

s. Public Administration or Defence
t. Scientific Research and Development
u. Urban Planning
v. Others:

10. During post-secondary education, which of these factors influenced your future aspirations or choices? Select all that apply.
    a. Classmates or schoolmates
    b. Co-curricular activities (e.g., CCA)
    c. Grades
    d. Modules or subjects I took
    e. Internships or industry placements
    f. School advisors or counsellors
    g. Teachers or lecturers
    h. Others:
11. During post-secondary education, which of these factors influenced your future aspirations or choices? Select all that apply.
    a. Advice or expectations from parents
    b. Advice or expectations from siblings
    c. Financial circumstances
    d. Housing or neighbourhood
    e. Personal ambitions or desires
    f. Others:

Other Experiences

12. Feel free to share anything else that was not mentioned in this survey. (e.g., positive or negative experiences during post-secondary education)

Questions for Follow-Up Interview

13. You may also take part in an online interview where you can share more about your experiences in post-secondary education.
    a. [Tick Box] Yes, I am willing to take part in an online interview on this topic.
14. If you are open to being interviewed, kindly provide your email address so that you can be contacted by the researcher. Note that your email address will not be shared or used for any other purpose beyond this project.

Thank you for completing this survey on **Post-Secondary Education in Singapore - A Global City**. I wish you all the best in your endeavours!

APPENDIX D: SEMI-STRUCTURED INTERVIEW QUESTIONS

	Questions

Opening	• Go through the information sheet
	• Ask preliminary questions
	  ○ Age
	  ○ Post-Secondary Pathway
	  ○ Highest Level of Education Completed
	  ○ Occupation
	• Ask if it is okay to start recording

During post-secondary education	1. Describe a day in a life of an academic / TVET student 2. In the survey, for the one or two words used to describe your experience, you mentioned, __. May I ask why so? 3. What were some personally defining or memorable moments during your post-secondary education? 4. Go through the five-point rating scales in the survey 5. Is there anything else you would like to share regarding experiences in post-secondary education?

After post-secondary education	1. In the survey, your choices of universities were __. May I ask why so?
	  a. How did your post-secondary education shape your university aspirations?
	2. In the survey, your choices of careers were __. May I ask why so?
	  a. How did your post-secondary education shape your career aspirations?
	3. In the survey, for educational factors that shaped your aspirations, you ranked, __. May I ask why so?
	4. Is there anything else you would like to share regarding your aspirations after post-secondary education?

Closing	• Having reflected on their post-secondary education during the interview, invite interviewee to look through their own survey responses and ask if they would like to keep or change their answers

APPENDIX E: INTERVIEW INFORMATION SHEET

UNIVERSITY OF OXFORD
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general.enquiries@education.ox.ac.uk
www.education.ox.ac.uk

Experiences in Post-Secondary Education in Singapore

This information sheet explains why the study is being conducted and what your participation will involve.

What is the purpose of this interview?

This interview aims to explore how experiences in post-secondary education contribute to students' future aspirations and choices in Singapore. It is part of a larger research project that seeks to understand how the Singaporean education system shapes and supports a global city. Based on the data collected, the research project may make recommendations that would improve post-secondary education in Singapore.

Why have you been chosen?

Because you are attending or have graduated from either an Institute of Technical Education, Junior College or Polytechnic in Singapore. You are also between the ages of 18 to 35-years-old.

What will happen during the interview?

You will be asked some questions about your experiences in post-secondary education, which includes how your school prepared you for either work or further education at a university. The interview will take about 30 minutes. You can refuse to answer any questions by the interviewer.

Do you have to take part? What are the risks and benefits of taking part?

You are under absolutely no obligation to take part in this study. There are no known risks to participating in the study. You will also have an opportunity to reflect on your own educational journey in a way that you might not normally have had the chance to.

What will happen to the results of this research?

The interview data – your contact information and interview recording – will be personal data and are subject to the university's guidelines to protect your confidentiality. The researcher will make the interview data indirectly identifiable by excluding any identifiable information (e.g., names, schools) and deleting the recordings after transcription. The interview data will be stored on an encrypted and password-protected laptop, backed up on OneDrive for Business and accessible only to the student researcher and supervisor. The results of the research project may be used for presentations, but there will be no way for your answers to be linked to you personally. You will not be named in any publication or presentation.

Contact for Further Information or Follow-up

Should you have any further questions about this research, please do not hesitate to contact Joshua Ee (joshua.ee@wolfson.ox.ac.uk). The student researcher will answer any questions at all regarding data storage, how quotes would appear on the dissertation or other relevant concerns. You may also contact my supervisor, Dr Ariel Lindorff (ariel.lindorff@education.ox.ac.uk), or the chair of the Department of Education ethics committee, Dr Liam Gearon (liam.gearon@education.ox.ac.uk), if you have any concerns.

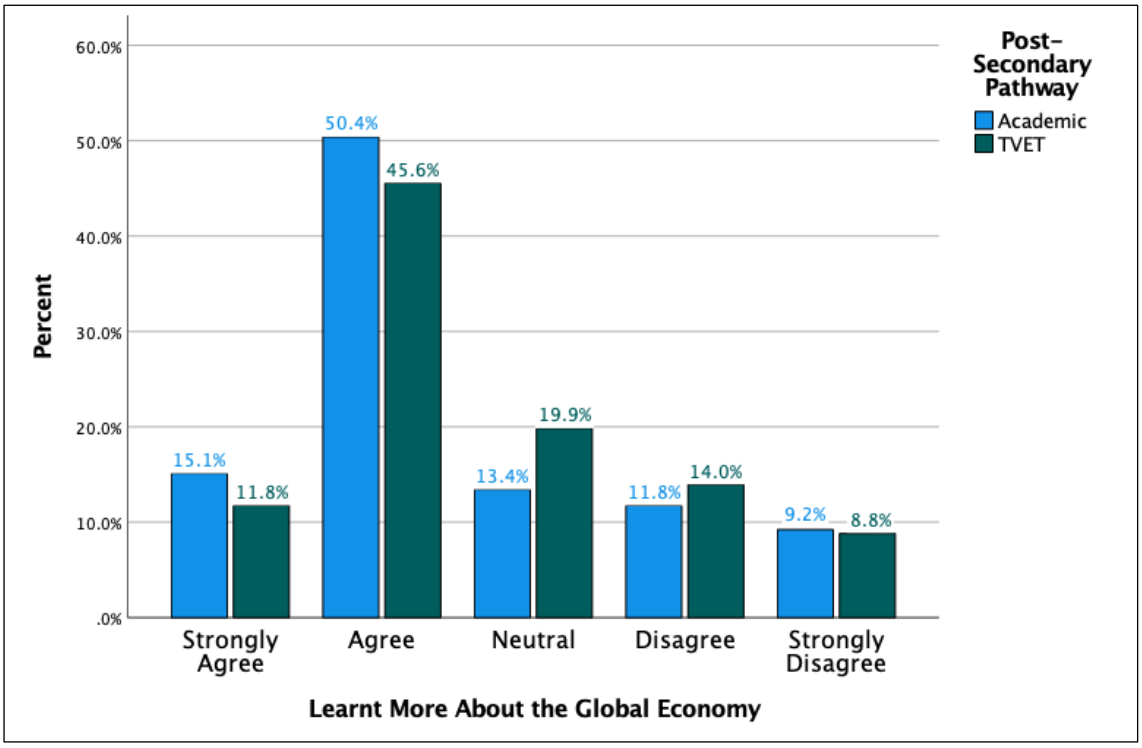
APPENDIX F: LIST OF DESCRIPTIVE CODES

List of Descriptive Codes			
	Code	*Description*	*Example*
Experiences in post-secondary education			
1.	Lifestyle and culture*	Overarching descriptions of the academic and TVET experience (e.g., rigour, rabak)	'Rabak' is very telling of not just who we are, but the fact that the Poly experience can be summed up as that as well. It's a coming-of-age mess that you just have to go through (25, TVET, Arts)
2.	Timetables or schedule	Day in a life of an academic and TVET student	Many of my classmates worked from almost the time when they got up, and started school, to when they slept. (25, Academic, Scientific R&D)
4.	Exams or coursework	Assessments that students were graded on or ranked by	All JCs do practice ranking people's performance through internal examinations (22, Academic, Finance)
5.	Higher education talks*	Talks to educate academic students on future university opportunities	We've also had a lot of overseas unis and local unis come to our school to talk about their programmes… it makes it very easy for people to apply to Oxbridge (23, Academic, Finance)
6.	Social activities*	Activities that TVET students were involved in outside of the school curriculum	We usually just eat dinner and play games, then sometimes you go out, go sing k[araoke], go party (25, TVET, Engineering)
7.	Learnt about the world	How interviewees gained knowledge of the world	My one month overseas exchange in Hong Kong… everybody did different things so we could learn from a lot of different sectors in Hong Kong (23, TVET, Social Services)
8.	Met international students	How interviewees met international students from various countries	[Name of JC] is one of the few JCs that host international students who do the A-level also, so these are ASEAN scholars (22, Academic, Finance)
9.	Met Singaporean students	How interviewees met Singaporean students from various backgrounds	I used to have a friend who was having financial assistance…. Then I have other friends who are driving Maserati to school, to Orchard (26, TVET, Consultancy)
10.	Entrepreneurship or innovation	How interviewees developed entrepreneurship and innovation	We had a Creative Entrepreneurship Project… you can start your own small business if it pans out. Some of the people that actually had funding, they could continue their project (21, TVET, Design)
University and career aspirations in the global city			
11.	Local public university	Relating to public universities in Singapore (e.g., NUS, NTU)	The majority of them all went to local public universities so NTU, NUS and SMU... It was almost an unspoken kind of assumption that the average student will be good enough for the local universities (30, Academic, ICT)

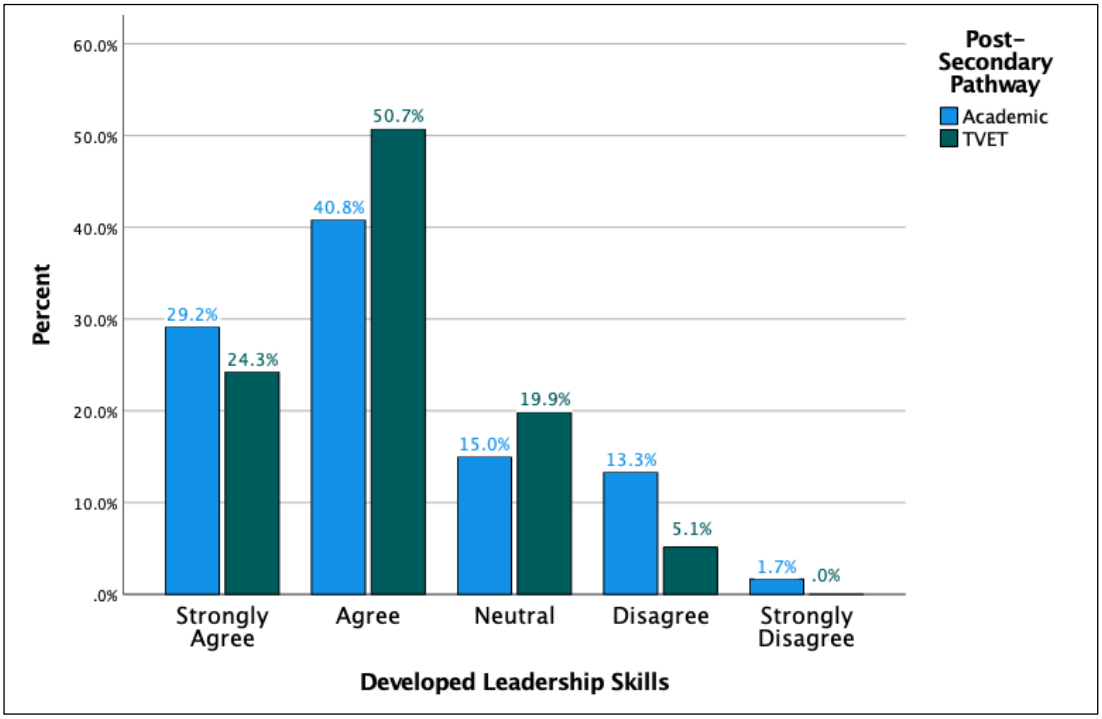
12.	Local private university	Relating to private universities in Singapore (e.g., LASALLE, RMIT)	When I graduated from [private] university, there was a harsh reality that I could not find a job because I was plainly average (26, TVET, ICT)
13	Overseas universities	Relating to overseas universities in various countries (e.g., Australia, UK)	I'm one of those that went to Australia to do my undergrad because I couldn't be a***d to apply to NUS and NTU because I knew I wouldn't get in. (32, TVET, Finance)
14.	Finances and state-sponsored scholarships*	Financial circumstances pertaining to university aspirations	You also had to find sources of money where you can pay your school fees, so there were also on the scholarship boards coming in to talk about their scholarships (26, Academic, Public Administration)
15.	Advanced Producer Services	Relating to careers in advanced producer services (e.g., advertising, finance)	There are still a lot of science courses [in TVET], but then these students usually and always go into the finance sector anyway (32, TVET, Finance)
16.	Non-Advanced Producer Services	Relating to careers in non-advanced producer services (e.g., arts, health)	One thing that happened a lot in my school was that they would push people to apply for [government body] scholarships (22, Academic, Defence)
17.	Executive or managerial roles	Pursuing leadership or strategic roles in their respective careers	My ideal career is to work in public sector. I'm most interested in Singapore smart city plans… hopefully in the future, I want to the progress on to more strategy roles (21, Academic, Public Administration)
18.	Global citizens	Familiarity with the world and understanding of their role in it	For [name of TVET course], one thing that they really wanted to bring out was that the world is your oyster and that you can achieve anything that you really want to do (26, TVET, ICT)
19.	Working abroad or in MNCs	Familiarity with the world and understanding of their role in it	I would not want to stay in Singapore for long. I will want to work in other companies, bigger companies in the US – Blizzard. All the other big companies in Canada, everywhere. (27, TVET, Arts)

List of priori and emergent codes during first-level descriptive coding. Emergent codes italicised.

APPENDIX G: OTHER SURVEY RESULTS



Survey results for whether Singaporean students learnt more about the global economy during post-secondary education.



Survey results for whether Singaporean students developed leadership skills during post-secondary education.

DECLARATION OF CONFLICTING INTERESTS

The author declares no potential conflict of interest for this dissertation.

FUNDING

The author did not receive any financial support for this dissertation.

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