



Science/Education Portraits VIII: Duoethnography of First-Generation Bioscience Undergraduates in a Private Education Institute in Singapore

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Abstract

It has been well-recognized that first-generation undergraduate faces unique challenges. This is made worse by being a first-generation undergraduate in a private education institution (PEI), commonly characterized by lesser resources as compared to public education institution, during COVID-19 associated social restrictions. Currently, there is no study to on first-generation university undergraduates pursuing their undergraduate education via a PEI in Singapore during this COVID-19 pandemic. In this article, we document the journey, challenges, and triumphs of three first-generation bioscience undergraduates in Singapore pursuing their bachelor's degree in a PEI during the pandemic using duo ethnographical approach. Our analysis suggests that challenges faced by first-generation undergraduate in a PEI in Singapore during COVID-19 associated restrictions can be seen as sum of challenges faced by first-generation undergraduate and challenges faced by in the education sector during COVID-19 associated restrictions; but the resourcefulness, resilience, and adaptability of first-generation undergraduate are also evident.

Keywords: COVID-19; Private Education Institution (PEI)

Introduction

During the height of the pandemic in 2020 with various unprecedented restrictions worldwide, an urgent call was put out by Soto Bermant and Ssorin-Chaiko to document the effects of COVID-19 on daily life [1] to enable future study when this pandemic is over, and researchers from various countries responded by offering personal experiences and that of others around them. These include Australia [2], Canada [3], India [4], Italy [5], Latin America [6], New Zealand [7], Papua New Guinea [8], Singapore [9], Vietnam [10], United Kingdom [11], and United

States of America [12]. Over the course of 2021 and 2022, there is gradual acceptance of endemic COVID-19 with increasing vaccination rates [13]. In Singapore, high vaccination rate is key for its transition to endemic measures [14]. With the standing down of Singapore's multi-ministry task force to deal with the COVID-19 pandemic and removal of most COVID-19 protocols nationwide from 13 February 2023¹, Singapore completes its transition towards endemic COVID-19, which signifies the nation's general reversion of routines back to pre-pandemic days.

¹<https://www.channelnewsasia.com/singapore/mask-wearing-feb-13-dorscon-green-mtf-covid-19-3265126>

Despite rapid adaptation to online curriculum [15], education is one of the many sectors severely impacted by the pandemic [16] and Singapore is no exception [17]. This is made worse for first-generation university undergraduates [18] in private education institutions (PEIs) [19]. A sector of about 300 PEIs in Singapore partnering with overseas/foreign accredited universities and institutions to bring in undergraduate and postgraduate programmes (commonly known as external degree programmes) into Singapore to supplement skilled workforce on top of public education institutions [19]. PEIs generally have lesser resources, support, and student population as compared to public education institutions; hence, faced conceivable difficulties during the pandemic. First-generation university undergraduates [18], defined as “students whose parents or guardians have not earned a bachelor’s degree” [20], as they faces unique challenges [21,22]; such as, lack of family support. The combination of COVID-19 pandemic and being a first-generation undergraduate has been exceptionally challenging [23–25]². However, there is no study to date on first-generation university undergraduates pursuing their undergraduate education via a PEI in Singapore during this COVID-19 pandemic. In this article, we document the journey, challenges, and triumphs of three first-generation bioscience undergraduates in Singapore pursuing their bachelor’s degree in a PEI during the pandemic.

Method

The method for this study is duoethnography, defined by Sawyer and Norris [26] as having “two or more researchers work in tandem to dialogically critique and question the meanings they give to issues and constructs”, which have been used in recent studies [27–31]. Burleigh and Burm [32] agree that duoethnography can provide meaningful conversation and reflection upon common experiences, which we argue is appropriate for this study. Specifically, we adapted the 4 phases (regressive, progressive, analytical, and synthetical) as described by Docherty-Skippen and Beattie [33]. Briefly, events and emotions were recollected by each individual in the regressive phase, followed by its description in the progressive phase. Perceived self-notions were let go in the analytical phase to highlight the context of the situation before analyzed collaboratively at the synthetical phase for similarities and insights. All four authors of this article

are first-generation university undergraduates, and collectively involved in this duoethnography. This duoethnography focussed on the first 3 authors (Andreas, Laren, and Kolistar) with the last author (Maurice) acting as facilitator. The following guiding questions were asked by Maurice to Andreas, Laren, and Kolistar in a WhatsApp group chat:

- What were the thought processes and events, including the choice of institution and course, leading to the start of pursuing a bachelor’s degree?
- What were your and your family’s expectations prior to the start of course?
- What were the support given or lack of support given?
- What were the challenges in the first semester?
- What were the challenges in subsequent semesters?
- How did the pandemic affect your studies and how did you overcome the difficulties faced, especially in 2020 and 2021?
- Now that you had completed your bachelor’s degree with honours, what were the similarities and differences by comparing with your peers in public institutions?
- What are your plans and outlook for the next 5 years?

Results

Duoethnography [26,32,33] was conducted among the authors between February and April of 2023, using WhatsApp as media, which can be useful in qualitative research [34–36]. Andreas, Laren, and Kolistar had completed 3 years of post-secondary polytechnic education leading to the award of a diploma prior to entry into undergraduate program. In Singapore, 3 years of post-secondary polytechnic education provides a combination of theoretical and hands-on training with internships aiming to equip graduates with skills suitable to enter the workforce.

Theme 1: Decision to Pursue a Bachelor’s Degree

The guiding question for this theme is “What were the thought processes and events, including the choice of institution and course, leading to the start of pursuing a bachelor’s degree?”

Laren

After completing my Diploma in Chemical Engineering from Temasek Polytechnic, I was without any desire to pursue a career

²<https://www.cnn.com/2020/07/28/coronavirus-has-been-extremely-challenging-for-first-gen-college-students.html>

relating to petrol-chemistry since it was made apparent that its market was crashing and above all, it was not a career I saw myself enjoying. On completing National Service, I considered pursuing business/sales; but my mother was not supportive of this endeavor as it was too volatile of a market, which required too much from someone who knew so little of it. I then returned to my “drawing board” and reminded myself of the fascinations I once had for the field of science. Realizing that I was in this rut of indecision due to my lack of interest that I had drawn from my diploma, I wanted to consider biology despite my initial years of education only exposing me to the elements of chemistry and physics. It was with a great leap of faith that I decided to bank on my unfound aspirations in this field with what little knowledge I had acquired regarding biology from my time in Temasek Polytechnic. Around the time I made this decision, it was November 2019, news began to spread on a potential viral threat to mankind, which brought about fear and a slight sense of purpose to my life’s unfulfilling monotony. “Succeeding in the field of medicine and healthcare!” was the driving motivation for me to try my hand at Biomedical Science. There were only two schools that I had qualified for during this time that I felt were the most aligned to me idealistically, BCA Academy and MDIS. I sent my queries pertaining to the course available to both schools; however, only MDIS had replied with the suggestion of coming down to the school directly to satisfy my qualms. I started my studies in MDIS in April 2020.

Kolistar

In 2018, after completing my Diploma in Biotechnology from Republic Polytechnic (RP), I aspired to be a veterinarian and began working full-time at a veterinary clinic as a veterinary nurse in order to gain experience for the application. However, due to the costly school fees, I did not pursue this aspiration further. During my third year working as a veterinary nurse, my father suggested that I become a medical doctor. However, I wasn’t sure about this decision. As a result, I decided to earn my degree in biomedical science first before deciding whether to attend medical school. Due to the high student-to-teacher ratio at local universities and the inability to find a biomedical science degree with honours locally, I decided to explore private education and found Management Development Institute of Singapore (MDIS) offering a BSc (Hons) Biomedical Science from Northumbria University, UK. With decent results in my Diploma in Biotechnology, I was offered a place in year 2 due to exemptions in 2021.

Andreas

I completed my Diploma in Mechatronics from Temasek Polytechnic and was planning to continue to pursue a bachelor’s degree in engineering right after two years of National Service. However, the thought of switching from engineering to science happened during the last few weeks before completing National Service. My low cGPA made me rethink if I should continue doing a bachelor’s degree in the related field. I was afraid to apply as I had the thought that I might not do well again. A few non-engineering related choices like business and science came to mind. I decided to research more on biological science as I find it interesting and the knowledge it gives is endless. One day while I was watching biology related videos on YouTube, I came across this video which was about switching career path where a middle-aged engineer decided to pursue a medical degree and he eventually became a doctor. This inspired and motivated me to not continue engineering and to go for science. I hesitated for a moment, as I knew that medical science would not be easy. Hence, I decided to go for biomedical science as a steppingstone towards medicine. I later discussed this with my father, and he was supportive with my decision. I researched about which private institutions in Singapore has biomedical science degree for non-science students. PSB and MDIS were the choices to choose from, both were reputable private institutions and I decided to go for MDIS due to financial issues.

Maurice

For Laren and Andreas, it seems that joining the workforce after National Service is not a consideration even though the purpose of a polytechnic diploma is to prepare graduates for the workforce. 2 decades ago, I also pursue my undergraduate degree after my National Service and joining the workforce with a diploma is not a feasible option for me back then. However, Kolistar work for 3 years before pursuing your undergraduate. So, for Kolistar, what made you decide to leave your full-time job for your undergraduate? And for Laren and Andreas, why joining workforce after National Service is not a consideration?

Laren

In this current generation, the unspoken rule to enter the workforce is to be no lesser than a degree holder. I believe that generally, one can only achieve success in the workforce through A) Experience and B) The ability to recognize the best “next course of

action when determining what is best for said company". Experience is an easy requirement to meet with time investment. There would hardly be any difference in this regard between a diploma holder and a degree holder. However, it is through attending universities that one would be better equipped to understand bigger terms and garner better team-oriented experiences; e.g., group work to determine the best treatment for a patient. The ability to call for decisions with a higher confidence level is what is expected from a worker who intends to climb the ranks, and it is this "knowledge" that we are attending universities for.

Andreas

For me, I wanted to study first, because I hesitated to work in the field I studied for in polytechnic (experience during internship). Moreover, I was not mentally prepared to step into the working society.

Kolistar

I decided to pursue a full-time degree after 3 years of working as I already have a plan to obtain a degree; however, I need the experience for application to vet school; thus, I went ahead and entered the workforce first. However, due to the expensive school fees, I decided to change a future career path. It took me a while to decide on what I would like to study; thus, I only went back to school after 3 years.

Maurice

Can I say that all of you consider an undergraduate degree as a requirement rather than a good to have, in current times? How do you envision yourself 10 years from now, with or without an undergraduate degree? I am trying to get your perspective on the perceived value of an undergraduate degree.

Laren

Yes, a requirement. Working as a research manager (with degree) while working as a head lab technician without, in 10 years' time. I doubt they would let me splice human genes for the government with a mere diploma. But getting masters of course would be a bridge I will have to cross in the future when I get there.

Andreas

Having a degree also implied that we have been taught more in-depth stuff than those without.

Kolistar

A requirement. With an undergraduate degree, there are more advancement opportunities than not having one. With a degree I could see myself as a biomedical research scientist while if without one, I could only see myself as a biomedical research assistant.

Theme 2: Initial Expectations

The guiding question for this theme is "What were your and your family's expectations prior to the start of course?"

Kolistar

Prior to the start of the course, my expectation was to earn a first-class honours by the end of the course and the expectation of my parents was that I would be able to obtain the degree to apply to medical school in the future.

Laren

My mother and I believed that this course was not going to be easy. Especially since it was completely different from what I had been exposed to thus far. Naturally, given how this course was anything but cheap, I wanted to give it my all. The goal was to simply graduate (bonus if Upper Second-Class Honours) and get a stable job to help support my family and future.

Andreas

My father wanted me to go for medicine initially; however, I told him that my results did not meet the requirements to get into medicine and I wasn't ready and would prefer to go for biomedical science to start with. I mentioned about the jobs biomedical degree could get me and he agreed to it. I was a little nervous at first as I studied engineering in polytechnic. I searched through the internet for the modules that I would be taking every semester and watched YouTube to give myself a heads up for each module. I was planning to further my studies in medicine after graduating from biomedical degree.

Maurice

I feel that the general sense is that all of you expected yourself to do well - getting a good honours degree. At the same time, there were fear and trepidation from Andreas and Laren since you changed course from what you did in polytechnic. How did you address those fears and trepidation? For my case, I was

going overseas and the week before I flew to Melbourne was an emotional rollercoaster - there is a fear of whether can I really do it, am I really ready to go to another country to study? It is a mix of excitement and fear. One of my friends put it accurately, it is like enlistment day for National Service again - the fear, the excitement, and the numbness. I almost wanted to tell my parents that I do not want to fly off but it was too late - the money had been spent and I know that if I pulled out then, I will never go Melbourne again. How about Kolistar, was there any fear and trepidation from your side?

Andreas

It's a gamble for me to go into science, after considering for some time, I decided to go for it. I was filled with both excitement and fear. Excitement as I was learning something new, fear as I was uncertain if I will make it to the end. I feel that the motivation of gaining scientific knowledge has overcome my fear of stepping into the unknown.

Kolistar

For me, I'm back to square one again. As after O levels, I have already set the goal of getting either a bachelor in veterinary science or doctorate in veterinary science. However, as my parents couldn't fork out the money for it, I have to reconsider the plans for my future again and figure out where do I really see myself in the future as I would like to have a job that is able to allow me to be independently financial stable as well as enjoying the job and being able to stay in it long term. So, I guess there's more of fear than excitement.

Laren

It was quite common to fear the unknown with all its uncertainties. I've had my moments in life where it got the better of me and allowed it to affect my life and those around me, to the point where I knew it had to stop. Given how I have been conditioned by my past experiences, I managed these fears and concerns with some questions for myself to cope with these circumstances. 1) "Has it happened yet and how sure am I that it's not as bad as it seems?" (self-prompt to do research) and 2) "have I given it my all yet?" (self-prompt for reflection). It is through these self-check measures that I was able to put my family members and I at ease before beginning my lessons.

Theme 3: Support Systems

The guiding question for this theme is "What were the support given or lack of support given?"

Kolistar

As my parents were poorly educated, they were only able to support me financially and provide the school necessities.

Andreas

My parents were poorly educated, they could not give me useful advice about the academics but were able to support me financially with their savings.

Laren

My aunt betted on me and used her retirement funds to pay for the full course. This was coming off from her initial subsidizing of my elder brother's degree as well which had her struggle a lot during those years. Around the 2nd half of my course thankfully, my brother was able to return some of the money to my aunt to ease her financial burdens. From all this, my mother was providing me weekly allowance to get by whilst still working on the side to provide for the house.

Maurice

Can I say that financial amounts to most of the support? How about emotional support? One aspect of first-generation undergraduate is the overall lack of emotional support as our parents had not experienced tertiary education. My parents did not complete their secondary education; hence, are unable to advise me much. Do the same applies to you? If so, who do you turn for support? I recalled for myself is that one of my uncles (paternal aunt's husband) is a tertiary counsellor and was able to ensure me.

Laren

Yes, most of the support was financial, but I had a lot of emotional support from my family, even when my course was not their field of expertise. Most of my advice came from my brother whomst was also a first-generation undergraduate. To put simply, he was the one to slap me in the right direction and ensured that if I were to "slip and fall", it would have been on "calculated grounds" that I could easily get back up on my feet with.

Andreas

My father did not complete his secondary education as well and hence could not advise me much. I did not need any emotional support. My father just told me to study hard and play less. If I was struggling, I usually will go to temple and pray, I don't have the habit to consult anyone. Or should I say I'm not very good at expressing myself?

Kolistar

Yes, financial support is the main support as that's where my parents are able to contribute. Emotionally wise, not much. They just don't add on to the stress and to reduce the stress, I turn to games or my friends.

Theme 4: Initial Challenges

The guiding question for this theme is "What were the challenges in the first semester?"

Kolistar

It was the transition back to school, along with catching up with my classmates, that posed my biggest challenges during the first semester. Due to a 3-year gap before continuing my education, I needed a period of adjustment to life as a student. Moreover, since I am the only one in my cohort who entered this program in year 2, I have to work harder than most of them to understand the material.

Andreas

I did not face any challenges during the first semester; I was able to cope well.

Laren

Online lessons required getting used to, it kept breaking off in audio and visually, there even were times when the feed would die during lessons. Some of the lecturers wanted to use the "free trial" of Zoom, and had the class repeatedly leave the session to re-join a new one. When it came to "in-campus" learning, it was still for online lessons, but to make it worse, it was dependant on unstable Wi-Fi. No physical manuals or learning materials were provided until a complaint was made during the "school head and student meeting" which was rather pointless as the head back then dissociated himself from all blame and told the students to "deal with it" (Our school prior had no measures in place for a worldwide

pandemic, so all of you students are the lab rat generation that will just have to go along with it – not exact words but the point was there). There was a lecturer that was providing false information that led to a constant need to pause her lesson for re-correction. Some examples include: Renaming of known atoms in the periodic table, calculation errors in determining isotopes, improper use of formula to determine mass and moles, cations with anion suffix, lack of awareness when Zoom session ends and continues to teach an empty class, unable to properly substitute into correct part of workings, wrong association of covalent and ionic bonds are for metals and non-metals respectively, considering states of matter (solid, liquid and gas) as SI units, lacking common knowledge in IUPAC naming.

Maurice

This sounds bad. More importantly, did you see her after that semester?

Laren

No. She was not our lecturer for our modules prior to that.

Maurice

Good. I think the school realized and gotten rid of her. I guessed she was an exceptional case, and the rest of the lecturers are pretty alright. Based on what Laren accounted, you started your first semester during the early phases of COVID. When was it exactly? We will talk about the impact of COVID later. Having said that, I have to say that all of us, lecturers and all, were struggling with online teaching as most lecturers never done that before. In fact, we were given a 2-hour workshop and that is it.

Laren

Yes, Andreas and I started on 20th April 2020. I still feel that most of the lecturers were able to conduct their lessons exceptionally well. Exemplary lecturers include Dr Ray and you, Dr Ling. For the most part, the lectures conducted by you both were without faults.

Kolistar

We have no preparatory workshops for online lessons.

Maurice

OK, we will look at the impact of COVID later.

Theme 5: Subsequent Challenges

The guiding question for this theme is “What were the challenges in subsequent semesters?”

Kolistar

As I moved on to subsequent semesters, my biggest challenge was completing assignments before deadlines and attending online classes off campus. I invested more of my personal time in completing the assignments given in the following semester because more assignments were given in a shorter time frame. Additionally, since I started my degree after the circuit breaker lockdown measures, I had one semester of classes in school. In the first half of the second trimester (year 3) however, classes were moved online because of the heightened number of Omicron COVID-19 cases. Taking online classes challenged my self-discipline in remaining engaged in lessons, and I was unable to ask questions as easily. With classes being online, technical issues are inevitable and with the lessons recorded, during revision, the disruption might cause some parts to be missed in the recording. During this time, I spent more time self-studying and reviewing the materials more frequently in order to overcome these obstacles.

Laren

For me it was the introduction to new terminologies which I felt that I should be knowing since the class was talking about it like its been mentioned before (i.e., Andreas). It was the lack of foundation in this field of science that had me pressured to study. Similarly to Kolistar, I too had trouble keeping up with assignments (by-product of having to cope with new knowledge).

Andreas

I did not have any difficulty until I faced a module which I did not personally like. I don't usually go out much so I stayed at home to watch YouTube to understand the modules better and to read eBooks which were widely available on the internet. And also, I did not play any computer games until year 2 thus the spare time was invested in studying.

Maurice

Can I say that challenges in subsequent semesters are not as drastic as those in the first semester since things have eased in?

Laren

It got easier in that online lessons were slightly more “professional” after the first semester. It felt a little more difficult for the students whom were not properly attuned to the requirement of having to study outside of their current scope. Considering how I didn't fail or re-module, I guess it's still a net positive in that aspect.

Theme 6: Effects of Pandemic

The guiding question for this theme is “How did the pandemic affect your studies and how did you overcome the difficulties faced, especially in 2020 and 2021?”

Laren

Several factors were impeded by COVID. Physical & emotional factor: I was living with my immuno-compromised grandmother during that time. Every laboratory day was a struggle for me. Having to go to school in fear that the person next to me could be a host for the virus to have me deliver it back to my family. It was to say the least, impactful on my actions in public; which then led to social factors: having to befriend the class without being the least bit close to them was a struggle. When invited to even have lunch, I had to avoid their line of sight with their masks down which affected how they would perceive me, their class representative. At times I would lose sleep over it, maybe appetite, I certainly didn't want to leave my house but that was not an option. I kept these factors separated from my academic prowess as much as I could have, but nevertheless, it was a concern that kept ringing at the back of my head every once in a while, which slowed me down a little. How I overcame them? I just stay out of home for as little time as possible and made sure I avoided contact from everyone. There came a time when the lockdown was lifted but I was very unwilling to hang out with people.

Andreas

Pandemic did not affect my studies much, as I'm used to staying at home even before the pandemic started.

Kolistar

It did not affect me much as well, as my polytechnic uses PBL (problem-based learning), therefore, I am trained to find out answers to problems independently.

Maurice

So, it seems to me that studies/lecture-wise, you are not really affected by the pandemic. The impact seems to be more of personal life. How about practical and laboratory sessions? – Are they physical laboratory sessions?

Laren

Most of them were physical sessions, yes. The difficulties we faced were mostly none covid associated. But there may have been some classmates who did fall ill to the virus; thus, missed one or more lessons.

Kolistar

Yes, there are physical laboratory sessions. As I do have experience with laboratories during internship and in polytechnic and I would say more than my classmates that went through the foundation programme, I would say there isn't any difficulty faced in understanding protocol and using most of the equipment.

Theme 7: Private versus Public Education Institutions

The guiding question for this theme is "Now that you had completed your bachelor's degree with honours, what were the similarities and differences by comparing with your peers in public institutions?"

Kolistar

After completing my bachelor's degree with honours, and comparing it with my peers from public institutions I found that the age range of students in private institutions is larger than that of public institutions. They have a GPA system, which we do not have, and they have to bid for their modules and set their schedules, which we do not have to do in MDIS.

Laren

According to the general consensus, I will say similarly, we are without proper work experiences, difference-wise, some companies may be looking out for graduates from public institutions?

Andreas

I have limited friends, those whom I keep contact with have found jobs during their last semester in public university as

compared to us. They had internships in public universities which we did not have, so chances of getting a job immediately after graduation is low. Then, I have a friend that did chemistry in National University of Singapore (a public educational institution) but ended up doing other job in Micron, like quality check or something, but the salary is good at around SGD 5000 per month. Another friend from Nanyang Technological University (a public educational institution) majored in biology ended up doing data science.

Maurice

Overall, do you find that private institutions due to their lesser student numbers, can be limited in terms of student experience such as internships and research experience? Or you do not see any difference?

Andreas

Yes, there is a difference between private and public institutions as private institution does not provide their students with internship options as compared to public institution which has both internship and research opportunities.

Laren

I agree with Andreas.

Kolistar

Yes. Internships allow an individual to sharpen their skills and also allow them to realise if a specific career prospect is right for them.

Maurice

If you were to do this again; say, cast yourself back 3 years ago; what might you have done to gain some form of internship or research opportunities?

Laren

There is a classmate who juggled between working for NUS and studying. However, to my knowledge, said individual failed to properly balance the work-study life in favour of the work life. If I had previous internships that were better associated with my degree, I would have opted to work part time for them during my holidays / off-days.

Kolistar

If I were to do this again, I will not choose to look for an internship or research opportunity when classes are ongoing, as there were already difficulties in trying to finish the assignments on time, studying for exams as well as completing our final year project. However, I would consider doing it during term break.

Andreas

For this question, I would have searched through the internet and applied for internship in related field during the holidays but I did not cause of the requirement which is minimally about 3 months when the holidays is only about 2 months.

Theme 8: Immediate Outlook

The guiding question for this theme is “What are your plans and outlook for the next 5 years?”

Kolistar

I have always been interested in working in a laboratory setting and worked in a laboratory setting as an intern at Bayer during my final year in polytechnic. My objectives over the next five years are to find a job in a medical laboratory setting and to decide whether I would like to pursue a master’s degree in a similar discipline.

Andreas

I have no concrete plans at the moment. I am now working as a laboratory technician in a clinical microbiology laboratory and will see how I progress from there.

Laren

I had intended to work in a lab as a lab technician in the medical field first and slowly adopt the required set of skills to be a research manager, from there save enough to hopefully take a Masters (very unlikely).

Discussion

We used duoethnography [26,32,33] to explore a unique intersection between first generation undergraduates, student experiences in a PEI, and challenges during COVID pandemic. Evident in the discussion is the need for undergraduate education, which is considered a necessity and a requirement rather than a want. Underpinning this is the hope for a better life [37] as Laren

put it, “get a stable job to help support my family and future”. However, there is a switch in career path in all 3 undergraduates – Laren switched from chemical engineering; Kolistar decided not to pursue veterinarian degree; and Andreas switched from mechatronics. Diploma to undergraduate degree in Singapore can be seen as resembling the continuum from associate degree to bachelor’s degree. This is consistent with a survey by Leu [38] suggesting that 35% of STEM college students and 30% of college students changed major at least once, which is consistent with a study by Drysdale, *et al.* [39].

In terms of support, Kolistar and Andreas indicated the lack of emotional support while Laren’s emotional support comes mainly from his elder brother who is also a first-generation undergraduate. Both Laren and Andreas indicated that emotional support were provided by their parents but not likely to be able to provide substantial advice. At the same time, Laren also felt financial stress within the family. This is consistent with studies suggesting that first-generation undergraduate tends to receive lesser emotional support [40] and have more financial stress [41] as compared to non-first-generation undergraduates.

COVID pandemic and subsequent restrictions overshadowed the challenges of embarking on undergraduate education as a first-generation student. This is made worse as Laren and Andreas started their undergraduate education right on the cusp of the most severe COVID restrictions and uncertainty. Generally, the society and education fraternity were unprepared for the resulting administrative changes as illustrated by Rudolph, *et al.* [42] and Wang and Ling [9]. Similar situations had been reported in other countries [43,44]. Depending on family situations, COVID brought other considerations as illustrated by Laren. Notably, situation normalized after the initial restrictions, which may be indicative of the resourcefulness and adaptability of first-generation undergraduates [45]. This is supported by Ivemark and Ambrose [46] suggesting that a large proportion of first-generation undergraduates are adjusters, characterized by adaptability and smooth transition into undergraduate environment while maintaining awareness of their social background.

Private education institutions have limited internship opportunities as compared to public education institutions in Singapore. While all 3 undergraduates recognize the value of

internships, the importance of academic work-life balance can outweigh the benefits of internships. A possible reason may be prior internships during their respective polytechnic education. Hence, the value of additional internship at the cost of academic work-life balance may not be appropriate as studies have suggested the importance of academic work-life balance to mental health and lifelong learning [47,48].

Conclusion

The challenges faced by first-generation undergraduate in a PEI in Singapore during COVID-19 associated restrictions can be seen as sum of challenges faced by first-generation undergraduate and challenges faced by in the education sector during COVID-19 associated restrictions. However, the resourcefulness, resilience, and adaptability of first-generation undergraduate are also evident.

Note

Andreas W Shin, Laren ZW Yan, and Kolistar SH Poh are joint first authors.

Conflict of Interest

The authors declare no conflict of interest.

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