Higher Education Success Factor Model: A Means to Explore Factors Influencing Indigenous Australian Completion Rates

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Abstract

The number of Aboriginal and Torres Strait Islander students enrolled at universities continues to increase; however, completion rates have not. In this study, we sought to understand what contributes to university completion rates by Indigenous Australian students. We employed a mixed-method approach, utilising the higher education success factor (HESF) model to investigate the factors that influence completion. In total, we surveyed 308 Indigenous Australians who had graduated between 2018 to 2022. We found that the economic conditions, social environment and individual characteristics were identified as three factors influencing the completion of Indigenous university graduates. We report that this model has worked well to provide a means to identify factors influencing Indigenous Australian success in higher education. Academic institutions can now use this model to identify how they can best support Indigenous Australian students by examining the three factors we have identified to see where their weaknesses may lie and where improvement can be made.

Keywords: Indigenous students; social determinants; university completions; HESF.

Introduction

In the last decade, widening Aboriginal and Torres Strait Islander peoples (hereafter referred to as Indigenous peoples) participation in higher education has remained a policy priority in Australia. The growing massification of Australian higher education and the rising call for educational equity continues to champion higher participation rates by Indigenous peoples (Wilson & Wilks, 2015). Australian policymakers have committed considerable resources to support initiatives aimed at increasing the number of Indigenous students enrolled in higher education (Koshy et al., 2019). Although the percentage of Indigenous students entering higher education institutions has steadily increased in recent years (Department of Education,

Skills and Employment [DESE], 2022), Indigenous students remain less likely to enter higher education than those from non-Indigenous backgrounds (Patfield et al., 2022).

Universities Australia (2022) defined student success as: "a university experience that fosters the successful completion of a degree that sets up students for favourable outcomes" (p. 22). Student success is also one of the focus areas in the Indigenous Strategy 2022-2025 (Universities Australia, 2022). This new strategy focuses on improving Indigenous access and participation at university while ensuring successful completions (Universities Australia, 2022). Despite the increasing enrolments of Indigenous students in higher education the completion rates have not kept up when compared to non-Indigenous students (Universities Australia, 2022).

Understanding factors that contribute to Indigenous student success remains the interest of Australian stakeholders, including governments, university policymakers, and researchers. Little is known about which factors have the greatest impact on the successful completion of university degrees by Indigenous students. Identifying these factors or social determinants of higher education is the aim of this paper.

Literature Review

Indigenous Australian Student Success in Higher Education

Factors that may impact Indigenous student success differ depending on the degree being completed and may also reflect personal and educational experiences that influence students' abilities to devote themselves to their studies (Anderson & Reich, 2017; Barney, 2016; Devlin, 2009; Hearn & Kenna, 2021). For instance, several determinants of attraction, retention, and completion for Indigenous higher degree by research (HDR) students have been identified by Hutchings et al. (2019) and include the role of Indigenous departments and units, cultural awareness and safety and support from family and community. Anderson et al. (2021) reported a range of success factors for Indigenous HDR students including quality supervision, academic support, and capacity building. Additionally, research (i.e., Moreton-Robinson et al. 2020; Pechenkina, 2014, 2015; Trudgett, 2010) demonstrated that Indigenous students need financial support, physical and social emotional wellbeing, mental health wellness, family support, and counselling and mentoring services during university. Universities Australia's Indigenous Strategy 2022-2025 (Universities Australia, 2022) highlights the way in which supporting Indigenous student success is required.

Hearn and Kenna (2021) reported that there was no measurable connection observed between financial investment and success rates for Indigenous students. However, a negative correlation was discovered between access rates and success rates. Their findings suggest that factors other than financial investment and access encourage participation and are required for successful outcomes. In another study, Hearn et al. (2019) investigated factors contributing to Indigenous students' retention and attrition rates and found that the decision of Indigenous students to withdraw was unrelated to academic and social factors. Instead, it underscored a notable connection between withdrawal and the type of enrolment. The above-mentioned findings are critical to our research as we are investigating factors contributing to Indigenous students' completion and exploring students' perspectives about the factors that influenced their completion.

Indigenous Student Success in International Higher Education Settings

Under-represented rates of Indigenous HDR students' participation have been reported in international institutions, including New Zealand and Pacific Island countries (Mayeda et al., 2014; McKinley et al., 2011; Theodore et al., 2017), Canada (Bailey, 2016; Childs et al., 2017) and the United States (Keith et al., 2016). Racism is also reported to be a contributor to causing traumatic experiences of Indigenous students in university classroom (Fredericks et al., 2023) that may ignite the consideration of withdrawal.

In Canada, Bailey (2016) reported that despite this country's multicultural and inclusive reputation, Indigenous students still face racism and discrimination in universities. Bailey found that Indigenous students who experience racism and discrimination tend to drop out or withdraw from their study which has impacts on their personal and professional lives. They also reported Indigenous students face interpersonal discrimination, frustration with the university system, and isolation issues.

In New Zealand (Aotearoa), Curtis (2018) reported that Māori and Pasifika students exhibit the lowest likelihood of transitioning directly from high school to tertiary education when compared to other ethnic groups. The above-mentioned findings lead to low enrolment rates of Māori and Pacifika students in postgraduate and HDR programs. Potter and Cooper (2016) also found that there was a direct impact on Māori staff and students when institutions fail to provide culturally framed resources, programs, and pedagogical approaches.

In the United States, Native American students have faced many challenges in pursuing higher education. Factors such as under-preparation for the academic community, social isolation, family issues and cultural differences have been identified as factors affecting Indigenous students' success in higher education (Hoover & Jacobs, 1992; Hunt & Harrington, 2010; as cited in Keith et al., 2016).

In Latin America, Webb (2019) researched the successful stories of Indigenous students in higher education in Chile. They stressed the crucial role of the social capital in student success in higher education. Social capital was identified as providing Indigenous students with more opportunities to overcome the challenges in completing a university degree. Webb also highlighted the role of Indigenous students' resilience to break institutional barriers, and inequalities faced at university.

Research from Canada highlights the social justice alliance between Indigenous and non-Indigenous staff and academics to decolonise academic spaces and to support Indigenous HDR students (Mitchell et al., 2018). Similarly, studies from New Zealand address strategies for decolonising university spaces (Smith & Smith, 2018; Wilson, 2017). Pihama et al. (2019) emphasise the supporting mechanisms for Indigenous students and supervisors' strategies that could minimise the risk in a cross-cultural supervision improving students' completions. These studies also shared successful programs implemented in New Zealand for supporting Māori research students. In the meantime, United States (Nelson, 2021) research highlights the importance of Indigenous academic presence as a role model and support for Indigenous students.
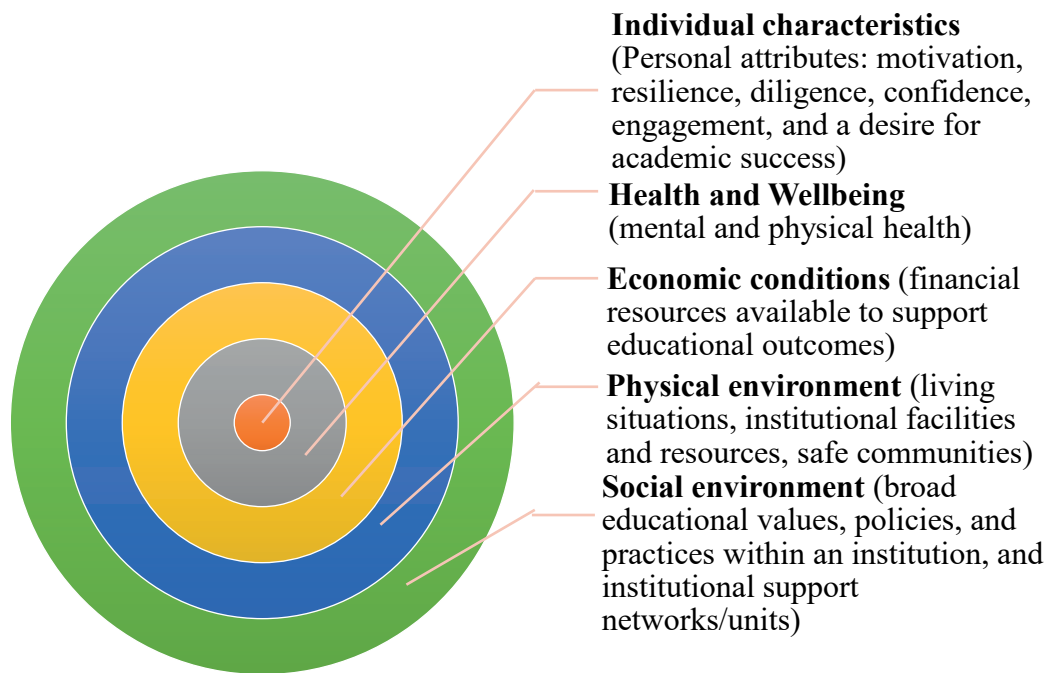
The Social Determinants Frameworks

The World Health Organisation (WHO) Commission on Social Determinants of Health (CSDH) framework highlights the role of education and race/ethnicity as social determinants of health (WHO, 2008). The term 'social determinants of health' is used to emphasise the impact of non-medical social factors influencing the outcomes of health in society (Marmot et al., 2005). Similarly, the WHO CSDH defines social determinants of health as the circumstances in which humans are conceived, developed, live, work, and age. In the CSDH framework, social determinants of health encompasses a socio-political context (governance, macroeconomic policy, social policies, public policy, culture and societal values); structural determinants and socioeconomic position (social class, gender, race/ethnicity, education, occupation, income), intermediary determinants (material circumstances such as living and working conditions, behaviours and biological factors, social environment/psychosocial factors, and the health system), and the impact on equity in health and wellbeing (World Health Organization, 2008).

Education is a powerful predictor of future employment and income and can help improve cognitive functioning and the communication skills required for better medical services. Race and ethnicity play a role because members of marginalised racial groups may have limited opportunities throughout their lives in discriminatory societies. The health status and outcomes of marginalised racial/ethnic groups frequently shows considerable disparities compared to more privileged groups (World Health Organization, 2010). Racial discrimination is a constant stressor in social interactions that damages health via psychobiologic mechanisms (Braveman & Gottlied, 2014) even in the absence of overt discriminatory incidents.

Sammen (2017) proposes a framework for understanding the social determinants of education which was based on a similar framework. This framework suggests five categories of social determinants of education, along with subcategories in each determinant: food security (i.e., insecurity), health and wellbeing (i.e., physical health), economic conditions (i.e., employment condition and assets), physical environment (i.e., housing and neighbourhood, and social environment (i.e., support network and discrimination).

The Higher Education Success Factor Model

The Higher Education Success Factor (HESF) Model (Figure 1) was influenced by the social determinants of health framework (Marmot et al., 2005; World Health Organization, 2010) and the social determinants of education framework (Sammen, 2017). While the broad categories delineated in the social determinants of health framework exert substantial influence upon all students, and are readily applicable within the education sector, individuals pursuing higher education are subject to a distinct array of factors specific to their higher education context. We scrutinised the determinants impacting university students through the specialised lens of higher education. We posit five categories for the HESF Model: individual characteristics; health and wellbeing; economic conditions; physical environment, and; social environment. This model emphasises the crucial role that the external (economic, physical and social environment) factors play as well as the inner layers connected to an individual.

Figure 1

Higher Education Success Factor (HESF) Model

Individual characteristics (Personal attributes: motivation, resilience, diligence, confidence, engagement, and a desire for academic success)

Health and Wellbeing (mental and physical health)

Economic conditions (financial resources available to support educational outcomes)

Physical environment (living situations, institutional facilities and resources, safe communities)

Social environment (broad educational values, policies, and practices within an institution, and institutional support networks/units)

Different from the social determinants of education framework, our model encompasses the individual characteristics instead of 'food security'. It is well-documented in the literature that individual characteristics such as motivation, academic and social engagement, resilience play the key role in university students' academic performance (Delvin, 2009; Krause & Armitage, 2014; McKenzie & Schweitzer, 2001). In the HESF model, the individual characteristics refer to personal attributes such as motivation, resilience, diligence, confidence, engagement and a desire for academic success.

While only physical health is accounted for in the health and wellbeing factor in Sammen's (2017) work, our model extends this dimension to encompass both physical and mental health. The academic literature concerning student success and academic performance underscores the association and impact of mental health on students' psychology, emotions, and wellbeing (Behrendt et al., 2012; McKenzie & Schweitzer, 2001; Simpson & Ferguson, 2012). Consequently, it is crucial to incorporate 'mental health' in the health and wellbeing factor to examine its influence on student success.

Financial issues influence student retention and challenge student success for both Indigenous and non-Indigenous students (Anderson et al. 2022; Barney, 2016; Behrendt et al., 2012, Britt et al., 2017). Providing financial support for students who experience financial hardship is crucial as financial hardship contributes to increasing the likelihood of discontinuing study (Britt et al., 2017). In our model, economic conditions pertain to financial resources allocated to support education outcomes, including scholarship, parents' or guardians' employment conditions.

While Sammen (2017) categorised housing and neighbourhood in the physical environment factor, our model expands this factor to incorporate institutional facilities and learning resources, along with living situations and safe communities. As institutional facilities and allocation of resources strongly influence students' retention and remain their engagement in higher education (Barney, 2018; Behrendt et al., 2012; Krausse & Armitage, 2014), it is critical to evaluate the impact of institutional facilities and learning resources on student success in higher education.

The social environment in our model refers to broad education values, policies, and practices within an institution, including the university learning environment, course or unit design, and academic and administrative staff professionalism, and institutional support network/units. While the social determinants of health emphasize social conditions shaped by socioeconomic and political factors on the health and wellbeing of people and communities, our model aligns with Sammen's

(2017) framework concerning the support network in the education sector. Consequently, the HESF model stands out by focusing on values, policies, and practices within an institution that impact university students.

Our research aims to understand the factors influencing Indigenous Australian student success in higher education, and the research question guiding this paper is:

 How well does this model describe factors influencing Indigenous Australians participation and success in higher education?

This HESF model will help to identify factors that influence university completion

Methodology

The study adopted a mixed-method approach (Creswell, 1999) incorporating both quantitative and qualitative methodologies. The quantitative approach was used to assess the efficacy of the HESF model in identifying the factors contributing to the success of Indigenous Australian students. We developed a survey based on insights from the abovementioned frameworks and surveyed 308 Indigenous Australians who had graduated between 2018 and 2022. The five factors we used were *individual characteristics*, *health and wellbeing*, *economic conditions*, *physical environment* and *social environment*. The qualitative approach used thematic analysis to delve deeper into the impact of the above social determinants on students' completion.

Creswell (1999) described a mixed-method approach as one where the researcher integrates qualitative and quantitative methods of data collection and analysis within a single study. Its effectiveness presents a unique convergence model and an opportunity to examine the process of triangulating data. In this study, we used an online survey that could be measured quantitatively to validate the model of HESF and analyse the association between the factors across demographic variables. Qualitative data is often focussed on people's lived experience, the depth and the comprehensive nature of experiences and has significant potential to uncover intricates and nuances (Miles et al., 2020). The qualitative data we had was open-ended responses included in our survey and then analysed to understand the influences on student completion.

Research Participants and Data Collection

We focussed on Aboriginal and Torres Strait Islander peoples, aged 18 and above who had completed a university degree (i.e., Bachelor, Masters and Doctoral degree). Three screening questions at the beginning of the survey were used to ensure appropriate participants were recruited. In total, 308 Indigenous Australians who graduated between 2018 and 2022 from an Australian university completed our survey. This sample of Indigenous Australian graduate comes from a larger sample of the Australian graduates who answered the same questionnaire and are the focus of another paper (see Anderson et al. 2022). Our study was approved by the Ethics Committee at Queensland University of Technology (QUT) (Ethics approval number 6118). The research team designed an online questionnaire based on our research aim. The survey includes four sections:

1. Demographic questions (i.e., age, ethnic group, gender.)

2. A five-point Likert-scale asking graduates to rank their level of agreement from strongly agree to strongly disagree (i.e., strongly agree – agree – neutral – disagree – strongly disagree) on questions about the social environment (i.e., support network and inclusive university environment), physical environment (i.e., housing or neighbourhood), economic condition (i.e., parents'/guardians' employment conditions, financial support), health and wellbeing (i.e., physical and mental health), and individual characteristics (i.e., motivations, adaptation, resilience) which supported, hindered and/or influenced their success in university completion.

3. Ranking questions, where participants had to rank the three most important impact factors.

4. Open-ended questions asking graduates to provide more details on the factors they ranked as having the most impact on their completion. We asked open-ended questions about the challenges students experienced during their study; how they overcame those challenges and completed their study. We also asked if graduates have ever seriously considered withdrawing from their degree; what issues stimulated the consideration of withdrawal and what support they received to assist them in those tough time.

The Qualtrics survey tool was used at QUT and we hired Qualtrics to recruit participants. The panellists (participants) Qualtrics leverages are used for corporate and academic market research only. We had no contact with the participants and were not involved with the incentives received by the participants.

Data Analysis

SPSS software was used to analyse the quantitative data and NVivo software was used to analyse open-ended responses. The screening process was carefully implemented with Qualtrics to ensure that participants were chosen as per the research criteria and to ensure each survey was completed. Incomplete surveys were returned to Qualtrics and new participants were recruited by Qualtrics. Once we were satisfied with the responses, we cleaned the survey results and coded the responses. The data was then imported into SPSS and NVivo for analysis.

A descriptive statistics analysis was performed. The demographic variables such as Indigenous graduates, age, gender, enrolment status (e.g., full-time, part-time), employment status (e.g., full-time, part-time, casual), living conditions, financial conditions (i.e., how students paid their tuition fees and living cost during their studies), and university degree completion. Qualitative data (i.e., open ended questions) were imported into NVivo for thematic analysis to understand the reasons behind Indigenous graduates' ranking the factors that influenced their university completion the most.

Results and Findings

Indigenous Australian Student Profiles in Higher Education – A Descriptive Analysis

Among 308 Indigenous graduates, there were 204 (66.2%) Aboriginal peoples, 37 (12.0%) Torres Strait Islander peoples, and 67 (21.8%) Aboriginal and Torres Strait Islander peoples. Participants' gender was primarily male 70.1% (216), only 29.2% (90) were female, and 0.6% (2) of identified as non-binary (see Table 1).

Table 1

Demographic Characteristics of Indigenous Australian Graduates

Characteristics	Frequency	Percentage
Indigeneity		
Aboriginal	204	66.2
Torres Strait Islander	37	12.0
Aboriginal and Torres Strait Islander	67	21.8
Gender		
Male	216	70.1
Female	90	29.2
Non-binary	2	0.6
Age		
18-24	37	12
25-34	185	60.1
35-44	68	22.1
45 or older	18	5.8
First person attended university in the family		
Yes	177	57.5
No	131	42.5
Degree completed approach		
Full-time	250	81.2
Part-time	23	7.5
A mix of both	34	11
Degree completed		
Bachelor	131	42.5
Master	147	47.7
Doctorate	30	9.8

Most Indigenous graduates were aged of 25 – 44, including 185 graduates aged 25 – 34. Thirty-seven graduates (12%) were in the age of 18 – 24 and only 18 (5.8%) were 45 or older. Most Indigenous graduates completed their degrees as full-time students (250 graduates, 81.2%); only 23 (7.5%) were part-time students, and 34 graduates (11%) indicated that they did a mix of both full-time and part-time study while completing their university degree. First in family to complete a university degree included 177 Indigenous graduates (57.5 %). Of the total graduates, 131 graduated with Bachelors, 147 with a Masters and 30 with a Doctorate.

We also asked questions about relationship status, carer responsibilities and living conditions. Our survey recorded that 200 graduates (64.9%) were in a relationship during their study, including married (103, 33.4%), common law (17, 5.5%), dating (79, 25.6%) and other (1, 1.0%). One hundred and three (33.4%) graduates were not in a relationship, and five (1.6) people preferred not to reveal their status. We also found that 47.7% (147) of graduates had carer responsibilities while 158 graduates (51.3%) said they had no carer responsibilities (Table 2).

Table 2

Demographic Characteristics for Indigenous Graduates' Profiles (Continued)

Category	Frequency	Percentage
Relationship status during university		
Married	103	33.4
Common law	17	5.5
Dating	79	25.6
Other	3	1.0
Prefer not to say	3	1.0
Carer responsibilities		
Yes	147	47.7
No	158	51.3

The living locations of Indigenous students before they started their university degree, during their studies, and post-graduation are shown in Figure 2. There were a slight movement in the living locations of Indigenous students in metropolitans, regional and remote area. Overall, more Indigenous graduates lived in metropolitans areas.

Figure 2

Living Locations of Indigenous Students
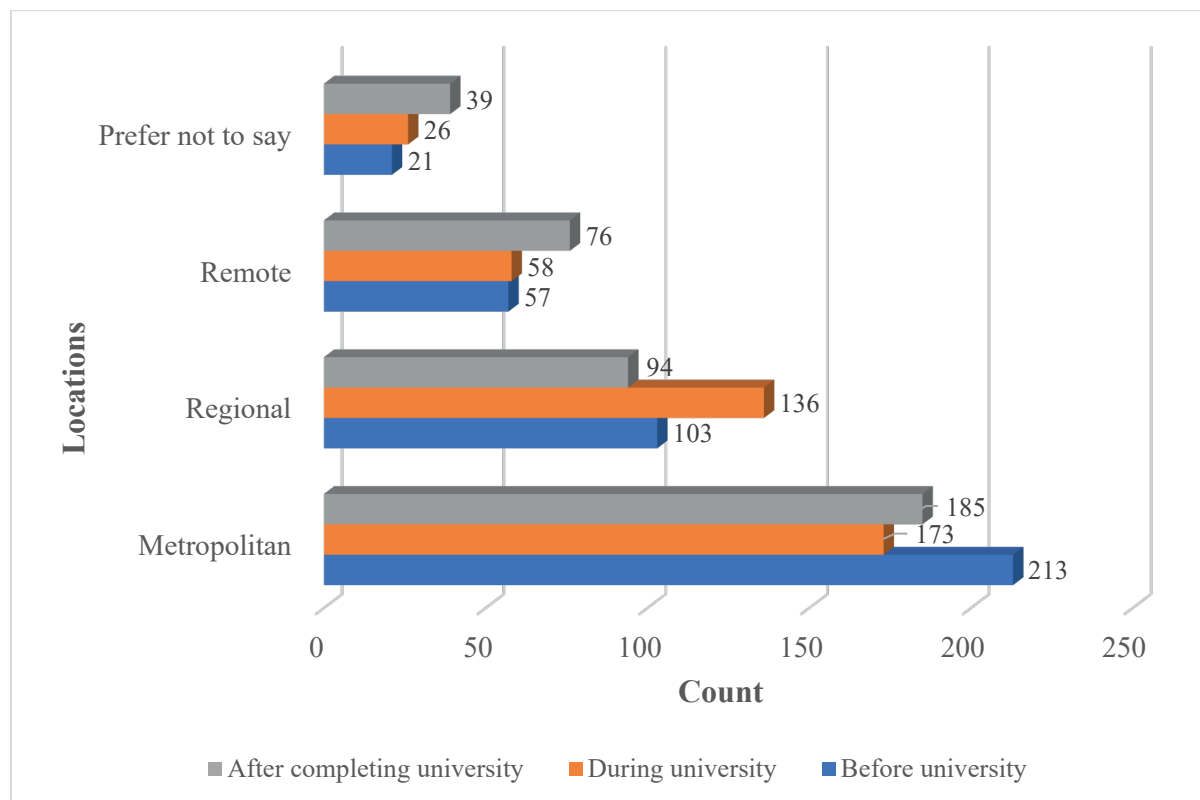
We also asked students to evaluate their overall university experience and found that most Indigenous graduates (136) had a good experience at university; 94 had excellent experiences (30.5%); 47 (15.3%) graduates rated their experience as neutral; but 27 Indigenous students said that their experiences in the university were just fair; and some (4 graduates, 1.3%) had a poor experience in the university. Figure 3 below illustrates Indigenous students' experience at university.

Figure 3

Indigenous Australian Students' Educational Experience at University
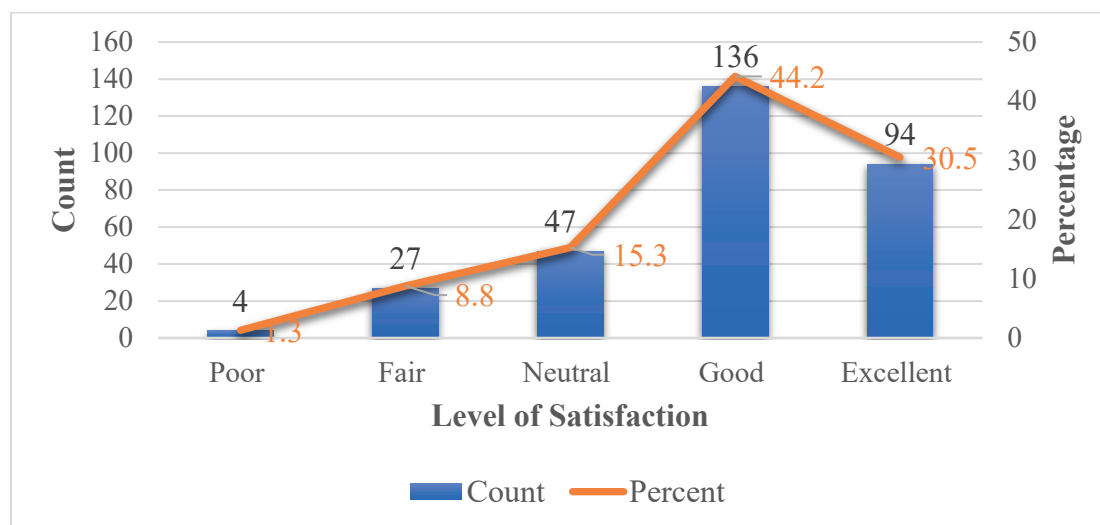
The Ranking Factors Results

We asked graduates to arrange factors from the predefined list into corresponding boxes. They choose from the most important, the important second and third, based on their perception of how these factors (social environment, physical environment, economic conditions, health and welling and individual characteristics) impacted their completion (Table 3)

Table 3

The Ranking Factors Results

Ranked	Social environment		Physical environment		Economic conditions		Health & wellbeing		Individual Characteristics	
	n	%	n	%	n	%	n	%	n	%
#1	146	35.4	59	14.3	80	19.4	78	18.9	50	12.1
#2	47	12.7	54	14.6	107	28.9	87	23.5	75	20.3
#3	34	13.1	51	18.1	65	23.1	36	12.8	96	34.0
Total	**227**	61.2	164	47.0	**252**	71.4	201	55.2	**221**	66.4

The economic conditions, encompassing parents'/guardians' employment status and financial support was the most frequently mentioned factor. It was rated as the first, second or third important factors by 252 graduates, rendering it the most influential factor. Social environment factor, including support networks and inclusive university environment was ranked as the first, second or third important factor by 227 graduates, thus emerging as the second influential factor. Table 3 also shows that the individual characteristics, such as motivation, adaptation, and resilience was ranked as the third most important factor as it was rated within the top three by 221 graduates. Health and wellbeing, including physical and mental health factor occupying the fourth place, was rated within the top three by 201 graduates. Evidently, physical environment was deemed the least influential factor, being ranked within the top three by only 164 graduates.

Why These Factors Influenced University Completions

The open-ended responses enabled Indigenous graduates to explain why they choose to rank the factors in a particular order. A word frequency query was run using NVivo software to identify words which were mentioned frequently by Indigenous graduates, and a line-by-line analysis was employed to ensure every response was captured (Table 4).

Table 4

Themes in Ranking Factors Responses

Ranked	Factors	Recurring themes/ terms	Frequency
#1	Economic conditions	Financial support (from both family and government fund)	49
		Stable or secure financial situation	29
		Good employment	5
#2	Social environment	Support (including institutional support networks/ units)	21
		Safe and secure learning environment	11
		Inclusive atmosphere/ environment	9
		good facilities	5
#3	Individual characteristics	Motivation	12
		Adaptability	34
		Resilience	5
		Determination	5
		A desire for academic success/ completion	1

Through the lens of the HESF model, Indigenous graduates reflected on the significant impact of the economic conditions on the completion of their university degree. By grouping graduate responses into the relevant categories and incorporating statements such as "financial support" (including both the financial support from their family and government fund), "stable or secure financial status", and "good employment", we identified financial support as pivotal in facilitating graduates' success since financial issues may cause challenges in students' lives, consume their time with work obligation, and distract students from their studies. The need for financial support was strongly echoed in the responses of Indigenous graduates with 49 repeated occurrences of this theme.

The financial support Indigenous graduates mentioned in their responses included parents or family financial support, scholarship and financial help from the government. For instance, an Indigenous graduate said that, "the financial support from my family can help me better study the degree course." And, "My parents' support made me have no worries." Other Indigenous graduates stated that: "without support from family and without the correct financial support, you are unable to complete a degree" and "I can't survive without financial support." A recurring theme of "stable and secure financial status" was found in analysing Indigenous graduates' responses with 29 instances of repetition.

An Indigenous graduate also said: "only in good economic condition, we can complete our study better." Another Indigenous graduate said: "the good economy allows me to focus on my studies." We captured the significance of "good employment" in contributing to student success, as expressed by an Indigenous graduate: "a good employment is conducive to a better completion of studies." Secure employment for both students and their parents/guardians fostered a sense of security and peace of mind, allowing students to maintain focus on their studies. In terms of the economic conditions factor, the HESF model appears to encompass every aspect of the financial matters, strongly supporting and enabling student success.

We analysed the responses of Indigenous graduates to elucidate the impact of this factor through the lens of the HESF model. We then identified that a "safe and secure learning environment", "sense of security", "inclusive atmosphere'" and "support networks", which encompassed various forms of assistance from educators, support services, and peer support, are frequently mentioned in the responses. The support network was highlighted in the responses of Indigenous graduates with 21 instances of repetition.

An Indigenous graduate stated that, "I wouldn't have been able to complete without support." Another Indigenous graduate said, "I'm actually satisfied with the support I received from this association. It really helped a lot" … "because you can't do it alone, you need a support network." Furthermore, another Indigenous graduate explained that it was because the social environment may influence their emotions, personality and impact the efficiency of their learning capacity and completion. With 11 instances of repetition, "safe and secure learning" environment was evidently a crucial matter to Indigenous graduates. An Indigenous graduate said: "I need to feel safe and involved in the university" or "the safety of the social environment ensures our personal safety." Graduates frequently mentioned the importance of "good facilities" (with 5 times of repetition) and an overall "inclusive environment" as key elements contributing to their positive experiences. The model of HESF aimed to gauge the comprehensive educational values, policies and practices within an institution, along with institutional support networks/units. Responses clearly indicated that this model adequately captured the social environment aspect of fostering student success.

Individual characteristics played a crucial role in motivating Indigenous students and driving their self-motivation to success. Ranked as the third most influential factor affecting Indigenous graduates' completion through the HESF model, the individual characteristics factor encompasses students' resilience, adaptability, motivation, and a desire for academic success as key factors which enabled them to conquer challenges, fostered determination, success and dispel thoughts of withdrawing from studies. Our findings showed that resilience, adaptability, motivation, and determination are common characteristics in Indigenous graduates' responses.

An Indigenous graduate said that, "if I didn't have resilience, I would have dropped out." Other graduates added, "resilience to environment is very important" and "I was very motivated and driven to complete my study." Also, "being motivated to finish my degree is what kept me motivated during [COVID-19] lockdown". Determining the inner self is the key, an Indigenous graduate indicated that, "without my own drive, nothing is possible … personal adaptability helped me to complete my learning faster." Or "adaptability is a necessary skill for studying" and "adaptability can make learning more efficient." Apparently, "adaptability" is an important characteristic helping students to succeed in higher education with 34 instances of repetition in the responses.

While our model also aimed to assess the significance of the "desire for academic success or completion", contribution to students' completion, we only found that one Indigenous graduate mentioned that she was driven to complete her degree. Interestingly, we also captured the "determination" in the responses of Indigenous graduates, despite this aspect not being a

focus of the HESF model. The expressions such as, "I want to do it and do it" or, "I think it's what I want to do" or similar expressions, recurred five times in the responses. Overall, a majority of Indigenous graduates reported that resilience, motivation, adaptability, and determination were crucial in contributing to their university degree completion in ways of facilitating their adjustments to student life, overcoming challenges, and committing to successfully completing their studies.

We also asked graduates if they had seriously considered withdrawing from their studies. We found that the COVID-19 pandemic was one of the common reasons Indigenous graduates seriously considered withdrawing from their studies. One Indigenous graduate explained that, "The stress of not attending classes during lockdown and being stuck in my room all day staring at the laptop. Not being able to socialise with friends combined with homesickness made me want to withdraw." Another Indigenous graduate added that: "Because Covid-19 has a big impact on a lot of people and me." Furthermore, some felt that stress, depression, mental health issues and financial hardship strongly impacted their studies and caused withdrawal consideration, while others stated that family burdens, family responsibilities were the reasons.

An Indigenous graduate revealed that, "Struggling to maintain work life balance and struggling with self-doubt, mental health, and difficult living situations" stimulated their withdrawal intention. Other Indigenous graduates said, "I was badly affected mentally by health life in general", and, "It got hard with no support, and I went a little with no income until I got a job while studying."

When facing stress, depression and mental health issues, some Indigenous graduates revealed that mental health support and counselling services had helped, however, they "had to sacrifice some meals for mental health support". For example, an Indigenous graduate said: "I forced myself to continue and invested in getting help from doctors to complete my study." Reaching out for educator-support, talking to parents, family members and friends, being resilient, and being committed to completing their degree were found to be effective solutions.

Self-motivation and family encouragement had been a great support for Indigenous students' during their tough time. An Indigenous graduate indicated that they "focused on my goals and the long-term picture. Had encouragement from my wife", which helped them overcome obstacles. Indigenous graduates also reported that deferring from their studies until their current problems had been resolved also prevented them from withdrawing.

Our findings also indicated that the COVID-19 pandemic, stress, depression, mental health issues, financial hardship and the burden of family expectations were the principal agents causing students to consider withdrawing from studies. Counselling and mental health support services, reaching out for support, self-motivation and encouragement, or temporarily deferral from studying were proven to be effective in assisting Indigenous students getting back on track with their studies.

Discussion and Conclusion

The aim of this article was to assess the efficacy of the HESF model on Indigenous students' university degree completion. Five factors: *individual characteristics, health and wellbeing, economic conditions, physical environment*, and *social environment* were examined. We identified economic conditions as the most influential factor on Indigenous graduates' completion, followed by the social environment factor and then individual characteristics. We found that the health and wellbeing factor and the physical environment factor had less influence on students' completion compared to the other three factors.

Findings related to economic conditions reiterate the need for financial support. Our findings differ from Hearn and Kenna (2021) who found that there was no quantitative correlation between financial investment and success rate for Indigenous students. However, students who had financial support in the form of tuition and/or living expenses were able to devote more time to their studies rather than working and have reduced stress. Our findings also agreed with Hearn et al.'s (2019) report that the decision of Indigenous students to withdraw was unrelated to academic and social factors. We found that Indigenous students pointed to mental health issues which led to thinking about withdrawing from studies.

The HESF model was designed to enable a thorough assessment of both the internal and external layers of social determinants. This model has proven to be highly effective in pinpointing the social environment factor as the second most influential aspect and individual characteristics as the third most influential. The model reinforces Indigenous students' critical need for support from educators, peers and institutional services, readily accessible within Australian institutions. This finding compliments prior research (e.g., Moreton-Robinson et al. 2020; Pechenkina, 2014, 2015; Trudgett, 2010) and further accentuates the model's efficacy in highlighting the need for additional support for Indigenous students to achieve successful outcomes. While

earlier studies may have focused predominantly on Indigenous students pursuing higher degree research, our findings broaden the perspective, advocating for comprehensive support across all levels of university education.

There is an opportunity for university policymakers and educators to act upon the findings from the HESF model and identify any potential weaknesses within their institutions. This model has proven effective at identifying the three social determinants impacting Indigenous students' completion rates. However, the model does not explicitly incorporate the determination characteristic which emerged from responses by Indigenous graduates. In contrast, the "desire for academic success" element was not clearly indicated in the graduates' responses. The model offers an additional means for identifying student needs essential for success. There is potential to expand the application of the HESF model to explore retention and success challenges in diverse settings beyond higher education, further enhancing its utility and impact.

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