

# Student Hub: Guiding Students Towards Academic Achievement

Mira A. Torrit

## Part A

### Abstract

This study investigates the effectiveness of school programs in the academic achievement of students. These school programs focus on key factors such as well-being, community engagement, versatility, mentoring, learning environment, program awareness, financial support, accessibility, and acculturation. In the New Zealand Skills and Education Group (NZSEG), these are available through the Student Hub. The Student Hub helps students find and use the right programs to achieve their academic goals.

The New Zealand Skills and Education students were chosen for the sample group in a random selection process. Each participant was given a single questionnaire for the survey. The descriptive statistics were used to summarize and present key features of the dataset, providing a comprehensive overview of the collected data. Graphical representations were also used to visually represent the distribution of data. In addition, Inferential statistics was used to validate the hypotheses.

### Introduction:

The success of the smallest to the largest unit of an organization depends on its people—so does the nation. Successful countries are being run by skilled people enabling businesses and the economy to operate efficiently. “As people play the most important role in shaping the country's status; education is responsible for shaping a person. Therefore, education is the backbone of any country; it plays a crucial role in technological developments and imparts various skills, values, and awareness” (Bansal,2020). In this context, the learning environment plays an important role. Our environment itself is a big training ground for our success. While a home (or family) plays a big part in developing our personalities, not everything can be learned there. That is the reason why we go to school. For most young people, school is their second home. They spend a lot of time studying, developing, and gaining skills. These are the great contributing factors that make up the totality of a person. In preparation for an independent and successful life, home and school are believed to be mostly working together. There is much more in the environment that shapes our personalities and skills. In this research, our focus is the school program.

The New Zealand Skills and Education College is dedicated to fostering the academic achievement of its students by ensuring their overall well-being as one of the key factors in academic success. These key factors are all available in the Student Hub. The Student Hub was designed to disseminate the various academic and non-academic support programs, making information more accessible to students. It ensures support for the well-being, addressing the mental health issues that students are experiencing during the learning process. This helps them to achieve their milestones smoothly and effectively. There are various programs to apply depending on the needs of the students such as Maori and Pasifika Scholarships, Maori and Pasifika Learner's Committee, Professional Development, Career and Study options for international students, orientation on life in New Zealand, English study, preparation for study, academic support, student feedback, learner voice committee, student well-being, financial support, IT support and career advice and many more.

## Problem Statement

With all the changes happening to young people, growing up is not easy. Learning and adaptation cause stress to most students. Imagine introducing a learning pattern for the first time and making it a habit. Certainly, it will take time to put it in our system. The physical, emotional, and mental changes should be guarded to attain the best result of learning. Technology is indeed a big help in the accessibility of various knowledge resources. However, this is not enough to fill the gap in achieving academic goals. The presence of the “Student Hub” integrates various programs that promote the well-being of the students, which is an important factor in academic achievement. Hence, it is important to examine and evaluate its effectiveness.

## Objectives

1. To measure the confidence level of the students in their academic achievement.
2. To examine the degree of cultural exchange
3. To identify the impact of mentoring and learning environment on academic goals
4. To learn the level of awareness of students in various school programs
5. To investigate the level of accessibility of the school program

By achieving these objectives, this research aims to offer insights that can help schools, educators, and policymakers create or enhance the current school programs.

In this regard, the following hypotheses should be validated:

**Null Hypothesis (H0):** The Student Hub has no significant impact on the well-being and academic achievement of students.

**Alternative Hypothesis (H1):** The Student Hub has a significant impact on the well-being and academic achievement of students.

## Related Literatures

According to Douwes et al. (2023), Despite the substantial interest in students' well-being in an academic environment, there's not much agreement on what exactly it means. The same thing applies to the well-being of students in higher education; it is defined in many ways. In their study, they emphasized the perspective of students on well-being. One response stood out, and that is the balancing between academic and non-academic activities and relationships, which refers to the student's work, social, and private life. Another student responded that it has something to do with another kind of balance, which is an effort-achievement ratio. This is the ability to achieve academic goals with less effort or stress. In relation to this, one student agreed and added that resilience is also important which is the ability to bounce back. Some students defined well-being as “feeling well”, referring to mental health, physical and social. Some talked about the support being offered by the university, particularly the facilities. And for some, their level of well-being changes, and that has a significant impact on their studies. The finding of the study suggests that students perceived well-being in a broad sense which is not limited to the concept of academics.

In the study conducted by Holzer et al. (2022), based on the existing literature of Bucker et al., 2018, there are no clear associations between well-being and achievement. The student's behavior patterns are related to academic goals which serves as motivation. At first, the research on academic goals focused on two types: mastery and performance goals. The mastery goal refers to learning new skills, optimizing one's potential, and being better than before. While performance goals show competence by achieving outcomes that align with high standards. Both were conceptualized as approach-based in

terms of orientation towards success. Later, an avoidance facet was added which is related to the avoidance of failure. The result of the study stated that the mastery-approach has proven to be the most beneficial for intrinsic motivation, performance, and adaptability. However, it has a very small effect on academic achievement, which is positively related to the performance goal approach. The avoidance, on the other hand, is consistently negative in relation.

Schools are continuously making ways to help students achieve academic goals by giving importance to the learning environment. In the research study of Earthman (2002), school building design features impact student learning. This includes the temperature, lighting, acoustics, and age. Researchers discovered that it has a negative impact on student performance where these deficiencies exist. The overcrowded school buildings and classrooms have been found to have a negative impact on student performance as well, especially on poor students. "Correlation studies show a strong positive relationship between overall building conditions and student achievement", (Earthman,2002).

The research of Arnaiz-Sanchez et al. (2020) focuses on teaching methodologies as an influence on the academic performance of the students by analyzing their improvement after introducing the revised curriculum in linguistics and mathematics. The result obtained was that there was a positive effect on the students who underwent the program than those who were not.

In the research conducted by Govorova et al, (2020), the common approach to measuring the effectiveness of the school system has focused on the academic performance of the students. But nowadays, it focuses beyond the acquired knowledge which is the well-being of students. The result suggested further research on the definition of well-being due to its complexity. The cognitive aspect has an impact on the academic goal. School interventions are not strong enough to make an impact on well-being. The school-level variation got a higher score, which supports the cognitive-based approach.

Currently, researchers have different approaches to measuring the impact of well-being on the academic achievement of students. The above literature shows the complexity of its definition due to various factors in and outside the school environment.

## **Whakapapa**

While this research focuses on the school program as the main factor in the well-being and academic achievement of the students, most studies included the family as one of the important factors. The roots of resilience are established within the family through proper guidance and the embrace of cultural practices. Resilience is the ability to handle tough situations by being flexible in your thoughts, emotions, and actions. It's about adapting to challenges, both external and internal, and effectively navigating through them. The strong value of whakapapa, therefore, gives a solid foundation for the well-being of a student, which has a positive impact on the learning process and academic achievement.

## **Part B**

### **Methodology and Data Collection**

Random sampling was used in choosing the participants to capture the diversity and randomness needed for statistical validity. To gather the students' insights about the Student Hub, an online survey was distributed using Google Forms as a platform. The reasons for using the Google Forms are the following:

- Free of charge
- Easy to use.

- Easy to edit.
- Supports a variety of question types
- Customizable
- Accessible
- Real-time data analysis

The survey questionnaire was communicated to the Head of IT and some tutors in December 2023 for consent and assistance in disseminating it to the students. However, due to the holidays and school break, only a few answered. Thus, follow-up communication with the two tutors was done in January 2024 through a verbal approach and Teams messaging. An additional communication to the Head of Seafield School of English was also done through Teams.

#### Request for assistance on data gathering (Survey)



Torirrit, Mira

To: Feroze Ashrafi; Jatinder Singh; Rajika Vyas; Vaibhav Fanibhare; Chirath De Alwis; Tracy Hinton  
Cc: Harsh Tiwari; Karla Malihan



Thu 14/12/2023 11:56 am

Dear All,

Good morning.

My name is Mira and I am a student of Data Analytics. We are currently doing a data gathering as part of our Assessment 1 in GD604 Data Collection and Analysis. In this regard, may I please ask your assistance to forward my survey questionnaire to your class 'general Teams'?

The survey aims to know the effectivity of NZSE Student Hub in the academic achievement of the students. This will take 3-5 minutes to answer, and all responses will be kept confidential.

I would greatly appreciate your assistance in this matter.

Below is the link for the survey:

<https://docs.google.com/forms/d/10TvX-fpKV04iu1UE2UMwVKVTZykevWMADILFUewGrBE>

Thank you and kind regards,  
Mira Torirrit

**Rajika Vyas** Chat Files 3 more +

1/15 2:20 PM Edited

Hi Rajika,

My name is Mira and I am a student of Data Analytics. We are currently doing a data gathering as part of our Assessment 1 in GD604 Data Collection and Analysis. In this regard, may I please ask your assistance to forward my survey questionnaire to your class 'general Teams'?

The survey aims to know the effectivity of NZSE Student Hub in the academic achievement of the students. This will take 1-2 minutes to answer, and all responses will be kept confidential.

I would greatly appreciate your assistance in this matter.

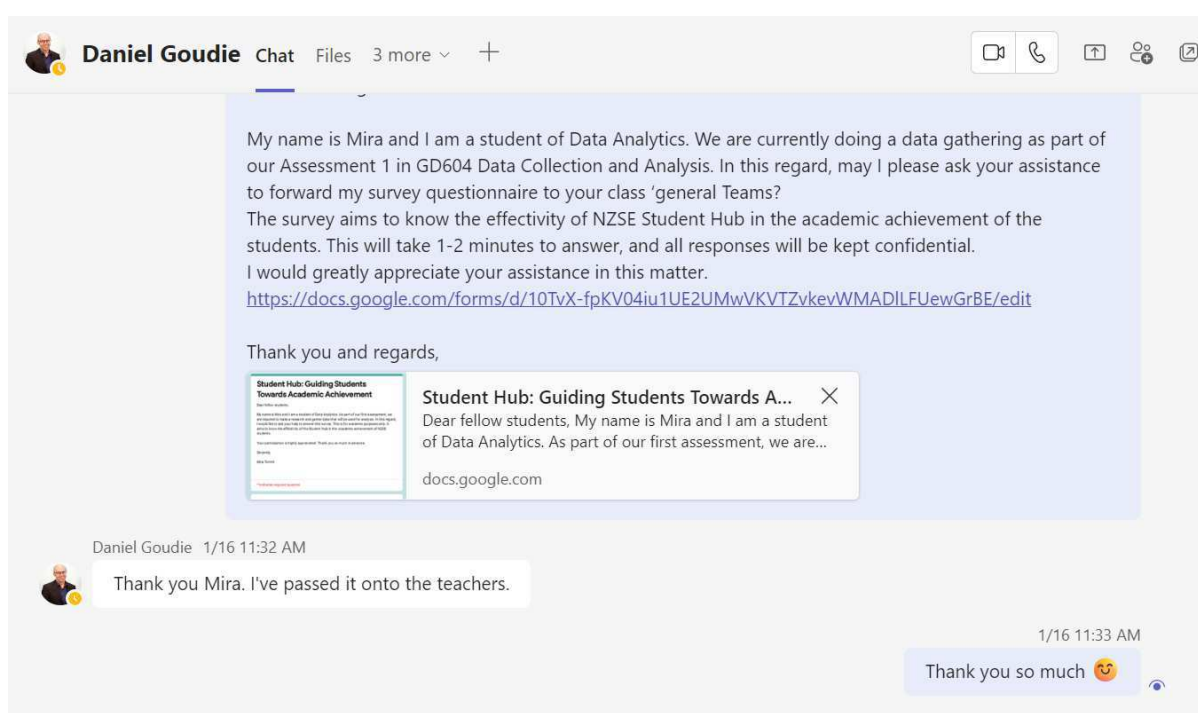
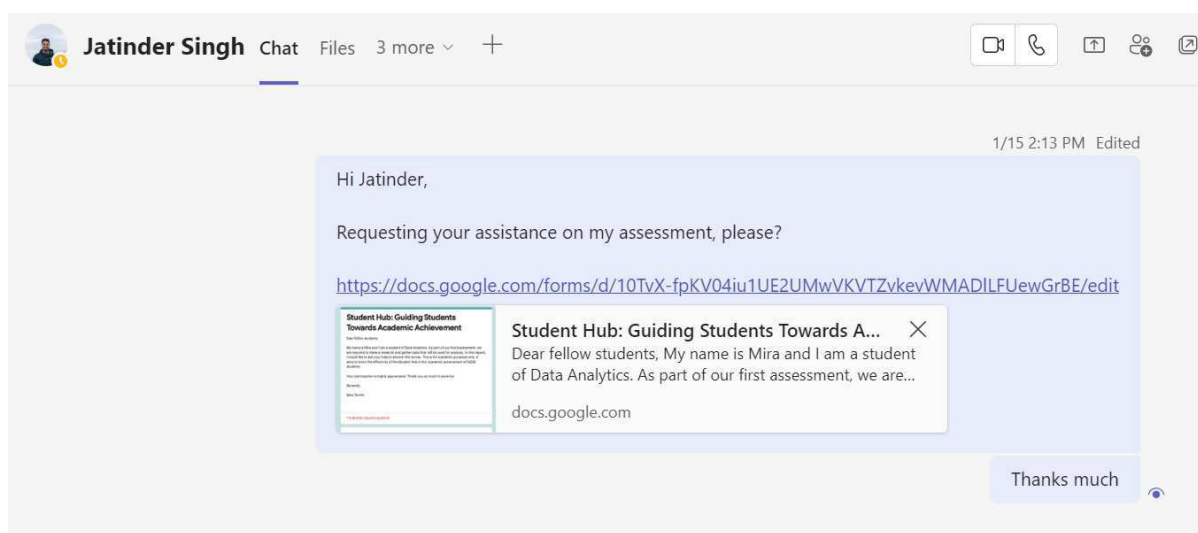
Thank you and regards

<https://docs.google.com/forms/d/10TvX-fpKV04iu1UE2UMwVKVTZykevWMADILFUewGrBE/edit#responses>

**Student Hub: Guiding Students Towards A...**

Dear fellow students, My name is Mira and I am a student of Data Analytics. As part of our first assessment, we are...

docs.google.com



The target sample data is a minimum of fifty students. The actual number of responses recorded is thirty. One of the respondents did not give consent and two responses were not successfully gathered due to technical error. Hence, the total number of responses became 27.

*\*Please click the link to view the survey questionnaire:*

[https://docs.google.com/forms/d/e/1FAIpQLScpi4mDSvUiC3SjrQAKJPIWBejLSnC5JAXLi6BKLh7g91V7g/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScpi4mDSvUiC3SjrQAKJPIWBejLSnC5JAXLi6BKLh7g91V7g/viewform?usp=sf_link)

*Or see Appendix 1*

## Part C

This research has adhered to ethical considerations in the following aspects:

1. **Mana** – New Zealanders, as a group, strongly identify with and take pride in their country's identity, experience a profound sense of belonging, and place high importance on cultural diversity. The opportunity for everyone to impart their cultural traditions to succeeding

generations is cherished, with a specific emphasis on valuing and safeguarding Māori culture. The participants in this research are composed of various nationalities and cultures. A single questionnaire was provided, focusing on ensuring its cultural appropriateness to make participants from diverse backgrounds feel at ease and respected. To be clear about the research's purpose, I briefly introduced myself and outlined the purpose of my study.

2. **Manaakitanga** – NZSE Student Hub program also supports the students' acculturation. This helps the students with diversity and cultural adaptation. To foster inclusivity among all participants, the collected demographic data encompasses major ethnicities. The age range for participation begins at 17 years old, the common university entry age, and extends to the maximum possible age range. To promote equality, both genders were also considered. The demographic information is gathered using a random sampling approach. In line with Maori cultural values, recognizing and appreciating diversity promotes equality among participants. These demographic details are considered secondary since they are not directly connected to students' well-being and academic success, primarily due to the limitation on the main factor, which is the school program. However, these are crucial to describe the sample population.
3. **Maori Data Sovereignty** – Ensuring participants are well-informed about the questionnaire's purpose, data usage, and their rights, I also incorporated the practice of obtaining informed consent. Providing an opportunity for the participants to choose whether to participate in the research or not. I implemented measures to ensure and protect the privacy and confidentiality of each participant by avoiding collecting their names and contact details. Lastly, I used the Google form to access the questionnaire. Which is composed of independent variables, namely academic achievement, and dependent variables, namely community engagement, versatility, mentoring, learning environment, program awareness, financial support, accessibility, and acculturation.

The questionnaire is composed of various categorical data namely:

1. Nominal – Gender, Ethnicity, Type of Students, “Are you enrolled in a scholarship program?” and “Do you know the NZSE Student Hub Program? “
2. Ratio/Interval – Age
3. Ordinal - Academic Achievement, Community Engagement, Versatility, Mentoring, Learning Environment, Awareness, Financial Support, Accessibility and Acculturation.

To summarize and organize the main features of the dataset, descriptive statistics were done by measuring the central tendency, variability, and frequency distribution. Along with the graphical representation for better visualization of data comparison and pattern recognition. For a broader approach to the correlation of variables and hypothesis testing inferential statistics were performed. Both descriptive and inferential statistics were used to come up with one conclusion.

### Statistical Approach

Different statistical techniques were performed using Python, as a tool to get the strength and direction of the relationship (correlation) and hypotheses testing. The raw data have undergone data cleaning/cleansing due to technical errors. This process ensured the consistency, reliability, and validity of the research. To summarize or simplify the dataset for comparison, the basis for inference, data exploration, and statistical testing, the distribution of central tendency was also performed. Boxplots and heat maps were used as visual representations.

## Descriptive Statistics

Table 1: Distribution of Central Tendency – shows the numerical summary of responses.

	Age	Gender	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awareness	Financial Support	Accessibility	Acculturation	Ethnicity_Asian	Ethnicity_European	Ethnicity_Pacific peoples, Other ethnicity
<b>count</b>	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000	27.000000
<b>mean</b>	2.703704	0.629630	0.703704	0.481481	0.666667	4.037037	3.888889	3.851852	4.037037	4.000000	4.074074	3.518519	3.703704	3.777778	3.851852	0.888889	0.074074	0.037037
<b>std</b>	1.409168	0.492103	0.465322	0.509175	0.480384	0.517500	0.800641	0.533761	0.517500	0.392232	0.474417	0.802418	0.724028	0.640513	0.718101	0.320256	0.266880	0.192450
<b>min</b>	1.000000	0.000000	0.000000	0.000000	0.000000	3.000000	2.000000	3.000000	3.000000	3.000000	3.000000	2.000000	2.000000	2.000000	3.000000	0.000000	0.000000	0.000000
<b>25%</b>	2.000000	0.000000	0.000000	0.000000	0.000000	4.000000	3.000000	4.000000	4.000000	4.000000	4.000000	3.000000	3.000000	3.500000	3.000000	1.000000	0.000000	0.000000
<b>50%</b>	2.000000	1.000000	1.000000	0.000000	1.000000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000	3.000000	4.000000	4.000000	4.000000	1.000000	0.000000	0.000000
<b>75%</b>	3.500000	1.000000	1.000000	1.000000	1.000000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000	1.000000	0.000000	0.000000
<b>max</b>	6.000000	1.000000	1.000000	1.000000	1.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000	1.000000	1.000000	1.000000

Figure 1: Box Plot of Variables

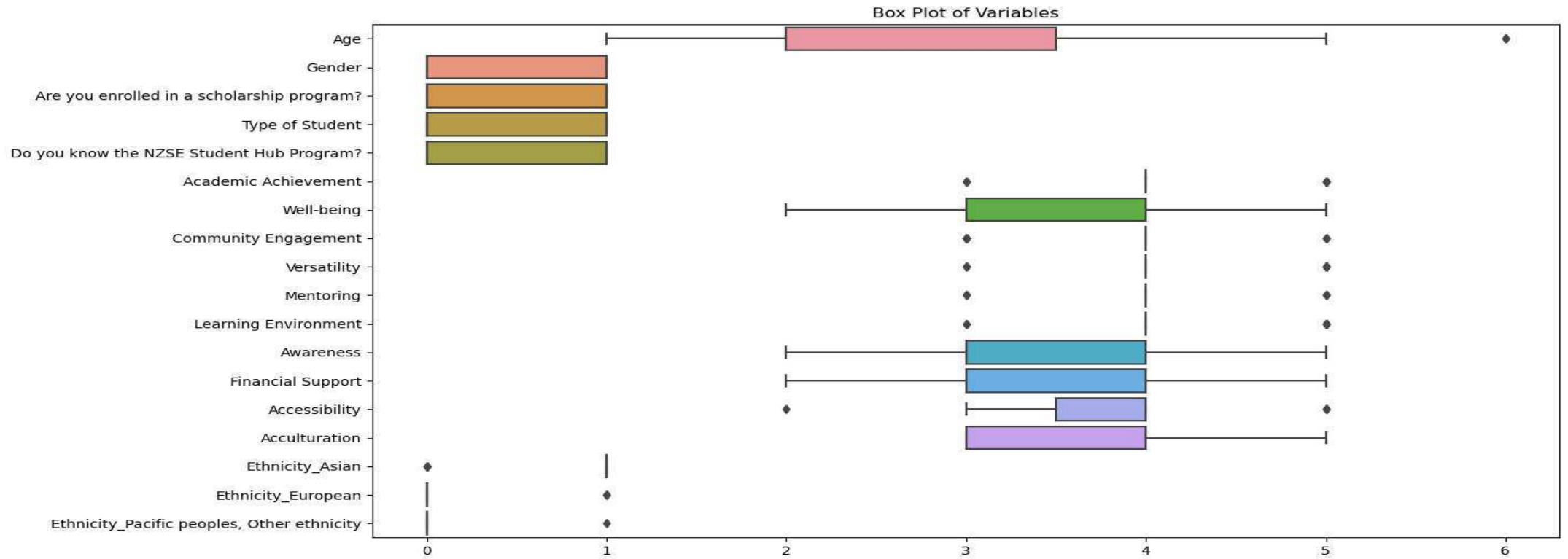




Figure 2: Heat Map

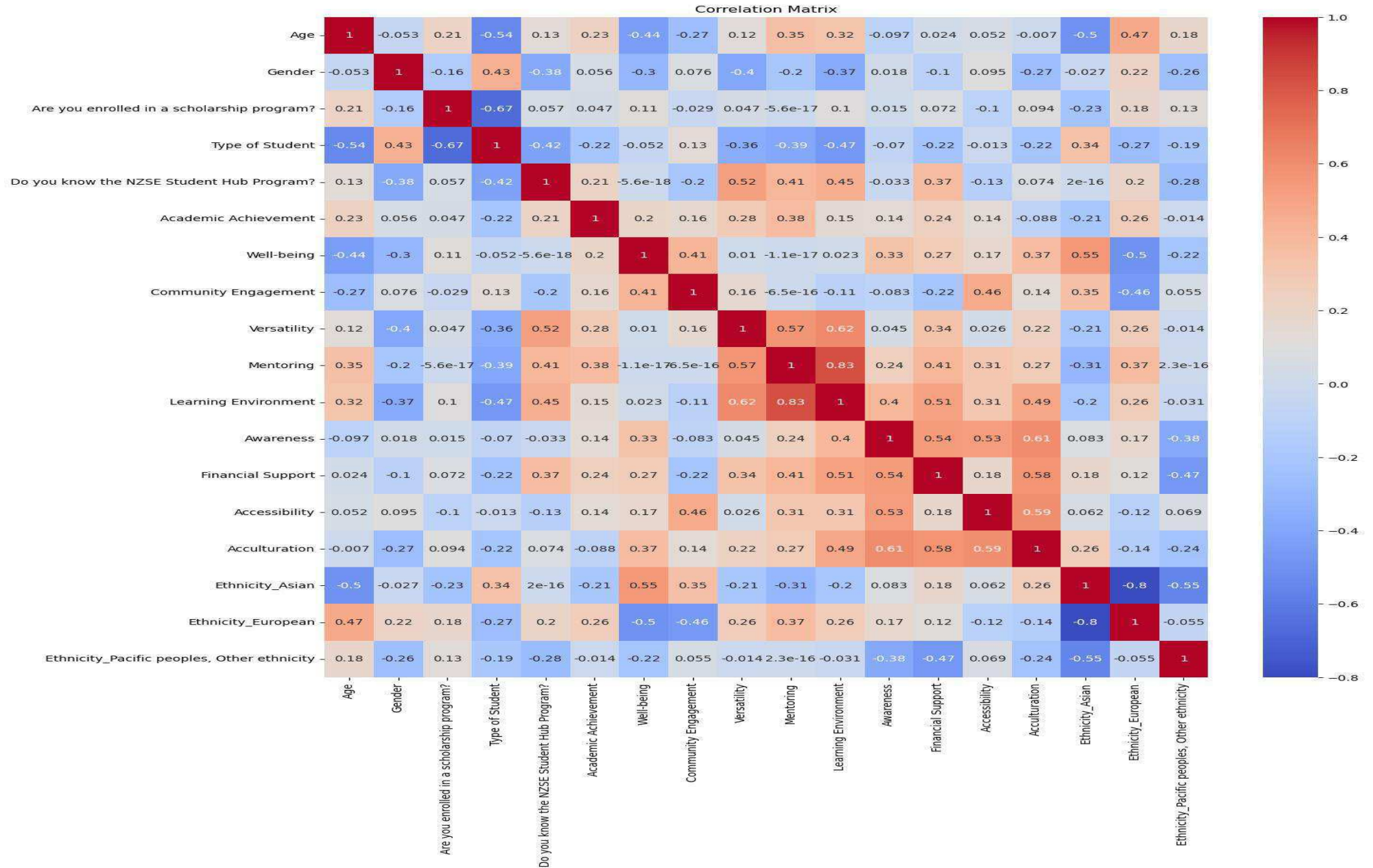


Figure 3

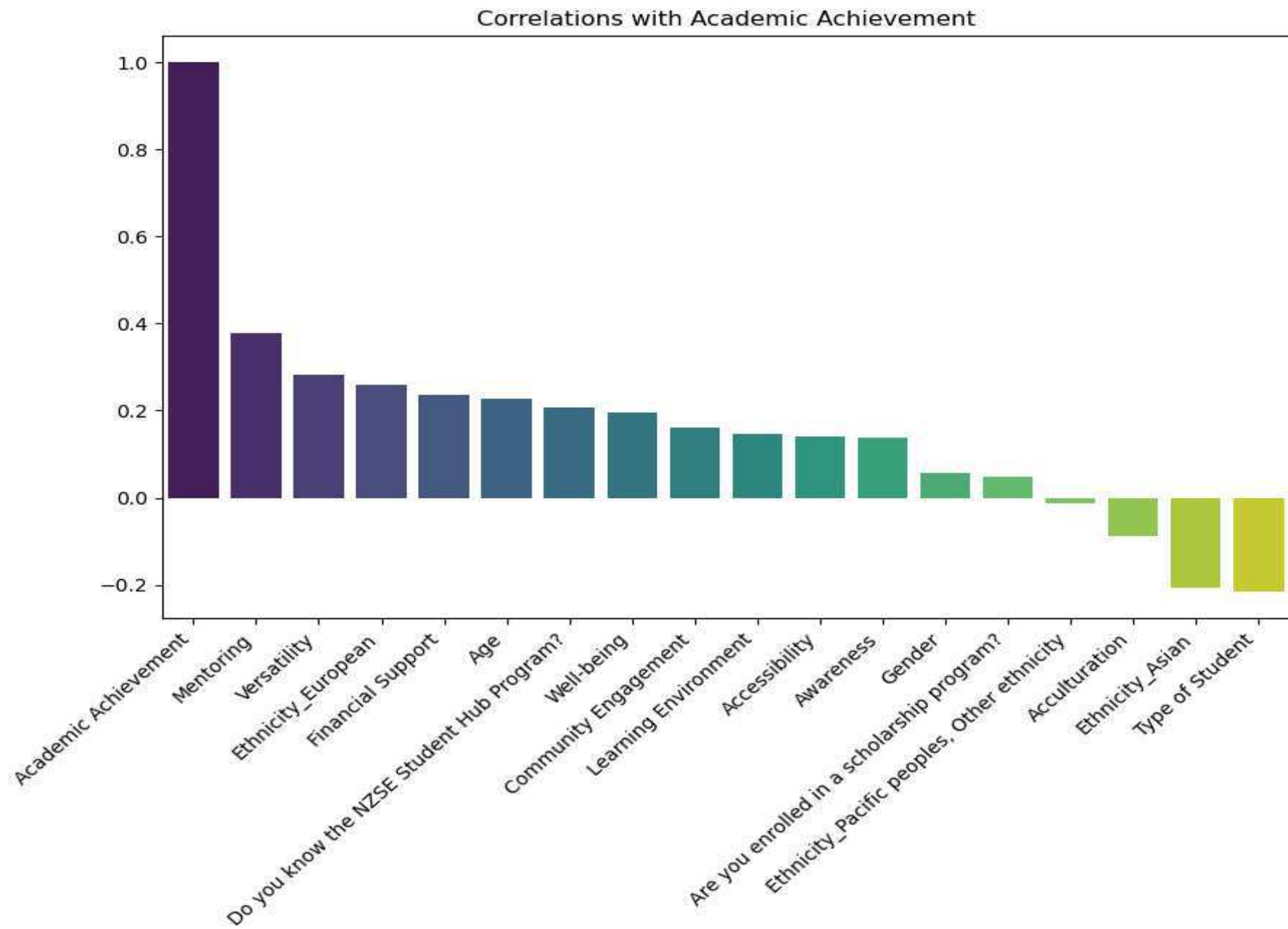


Table 2

**Correlations with Academic Achievement:**

Academic Achievement	1.000000
Mentoring	0.378968
Versatility	0.281915
Ethnicity_European	0.257855
Financial Support	0.235716
Age	0.226594
Do you know the NZSE Student Hub Program?	0.206284
Well-being	0.195970
Community Engagement	0.159870
Learning Environment	0.145055
Accessibility	0.141820
Awareness	0.137218
Gender	0.055937
Are you enrolled in a scholarship program?	0.047325
Ethnicity_Pacific peoples, Other ethnicity	-0.014303
Acculturation	-0.088165
Ethnicity_Asian	-0.206284
Type of Student	-0.216245

Table 3 : Correlation Coefficient Interpretation (Jaadi,2019)

Size of Correlation	Interpretation
.90 to 1.00 (–.90 to –1.00)	Very high positive (negative) correlation
.70 to .90 (–.70 to –.90)	High positive (negative) correlation
.50 to .70 (–.50 to –.70)	Moderate positive (negative) correlation
.30 to .50 (–.30 to –.50)	Low positive (negative) correlation
.00 to .30 (.00 to –.30)	negligible correlation

*\*credits: Parvez Ahammad*

The academic achievement shows positive low correlations to mentoring, versatility, European ethnicity, financial support, age, community engagement, learning environment, accessibility, and awareness. Negligible correlations in gender, scholarship program, ethnicity, acculturation, and type of student.

**Inferential Statistics**

Four statistical methods were performed to make inferences. A T-test was used to determine if there was a significant difference between the means of two independent (unrelated) groups. For the ratio/interval variable, Pearson's r was performed to quantify the strength and direction of a linear relationship between two continuous variables. A Chi-Square test was used for the nominal variables to assess whether there was a significant association between two categorical variables. Lastly, the ANOVA test was used to determine the variability between the groups. The p-value represents the strength of evidence against the null hypothesis, with an alpha value of 0.05.

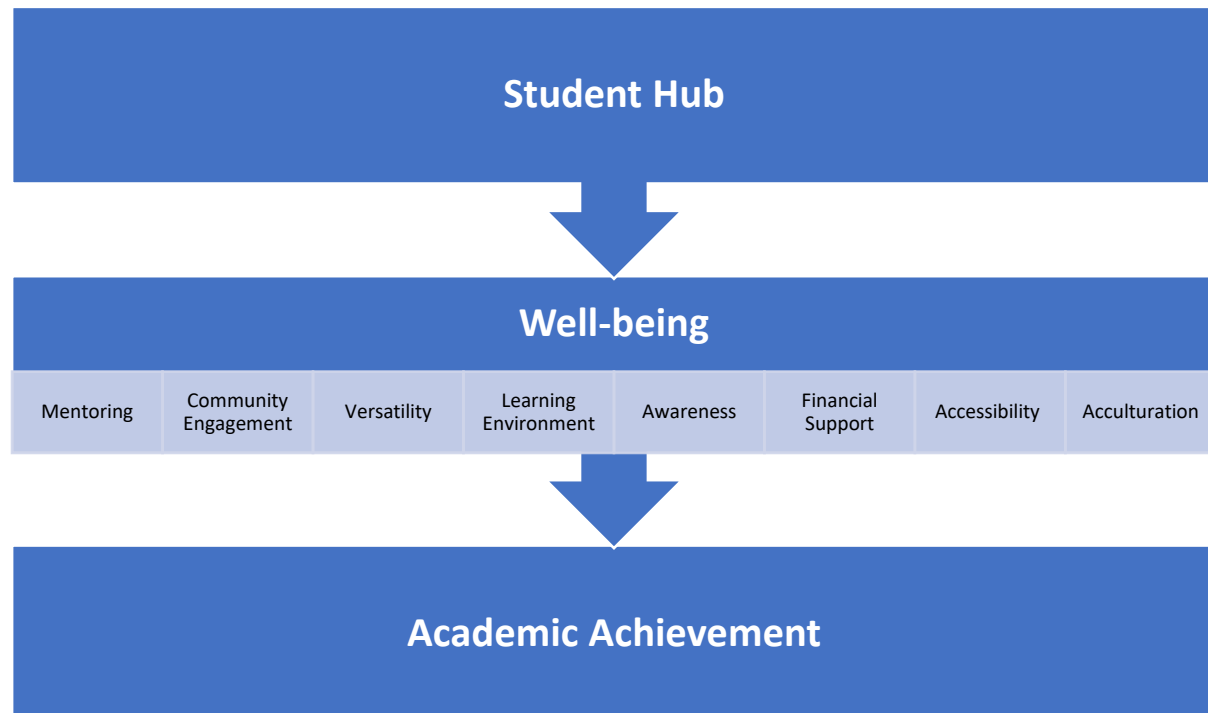
Table 3: Summary Results

\*Please see the attached Python notebook (Appendix 2) for the computations, details, and visual representations.

no	Variable	Statistical Methods					Reason for using the method
		alpha=0.05	Chi-square value	T-test statistics	ANOVA F-statistics	Pearson correlation coefficient	
	<b>Dependent Variable</b>						
1	Academic Achievement	not applicable					
	<b>Independent Variables</b>						
1	Gender	0.40	1.84				To determine whether there is a significant association between the two variables.
2	Ethnicity	0.44			0.85		To compare the different variable groups to the ordinal variable
3	Type of Student	0.28			1.23		
4	Are you enrolled in a scholarship program?	0.81			0.06		
5	Do you know the NZSE student hub?	0.30			1.11		
6	Age	0.26				0.23	To determine the strength and direction of a linear relationships between two quantitative variables, considering the age is a continuous variable
7	Well-being	0.42		0.81			To test significant relationships of 2 ordinal variables
8	Community Engagement	0.20		1.29			
9	Versatility	1.00		0.00			
10	Mentoring	0.77		0.30			
11	Learning Environment	0.79		-0.27			
12	Awareness	0.01		2.82			
13	Accessibility	0.11		1.64			
14	Acculturation	0.28		1.09			
15	Financial Support	0.06		1.95			
	<b>Note</b>						
	<i>If the p-value is less than 0.05, it is judged as "significant," and if the p-value is greater than 0.05, it is judged as "not significant."</i>						

Given that  $\alpha = 0.05$ , table 3 shows that only the Awareness is the only factor that has accepted the null hypothesis, and the rest rejected the null hypothesis. Although the financial support has a very tight margin with an acceptable significant level, it is safe to consider some factors affecting the result. In this regard, the research obtained the decision to reject the null hypothesis, which **means The Student Hub has a significant impact on the well-being and academic achievement of students.**

### Conclusion



Although most of the key factors of well-being have significant relationships with academic achievement, it is safe to consider the actual result of the correlations, which was interpreted as positively low. Hence, further research and investigations are needed. Additionally, the limitations of this research also influenced the result, particularly the actual number of samples versus the actual number of populations and student's awareness of the programs. Students can accurately rate only the specific program they joined. The rest of the key factors may be perceived from zero to less knowledge. **In this context, it is concluded that the student hub, which supports the well-being of students, has a positively low impact on academic achievement.**

## Reference

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## Appendix 1

1/28/24, 6:33 PM

Student Hub: Guiding Students Towards Academic Achievement

## Student Hub: Guiding Students Towards Academic Achievement

Dear fellow students,

My name is Mira and I am a student of Data Analytics. As part of our first assessment, we are required to make a research and gather data that will be used for analysis. In this regard, I would like to ask your help to answer this survey. This is for academic purposes only. It aims to know the effectivity of the Student Hub in the academic achievement of NZSE students.

Your participation is highly appreciated. Thank you so much in advance.

Sincerely,

Mira Torrit

\* Indicates required question

1. I agree to participate in the research project and give consent to use my details. \*

***No name and contact details will be collected in this survey for data privacy. Rest assured that all your responses will be kept confidential and you will not be identified.***

Mark only one oval.

☐ Yes

☐ No

### Demographics

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## 2. Age \*

*Check all that apply.*

- ☐ 17 - 21
- ☐ 22 - 26
- ☐ 27 - 31
- ☐ 32 - 36
- ☐ 37 - 41
- ☐ 42 and above

## 3. Gender

*Check all that apply.*

- ☐ Male
- ☐ Female

## 4. Ethnicity \*

*Check all that apply.*

- ☐ European
- ☐ Māori
- ☐ Pacific peoples
- ☐ Asian
- ☐ Middle Eastern / Latin American / African
- ☐ Other ethnicity

## 5. Are you enrolled in a scholarship program? \*

*Check all that apply.*

- ☐ Yes
- ☐ No



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## 6. Type of Student \*

*Check all that apply.*

- ☐ Domestic  
☐ International

**Program Awareness**

## 7. Do you know the NZSE Student Hub Program? \*

*Check all that apply.*

- ☐ Yes  
☐ No

**Outcome**

## 8. Academic Achievement: I comprehend the lessons/course program easily and am confident that I can proficiently apply the knowledge gained in my future workplace. \*

*Check all that apply.*

- ☐ Strongly agree  
☐ Agree  
☐ Neutral  
☐ Disagree  
☐ Strongly Disagree

**Key Factors**

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9. Well-being : A positive aspect of satisfying and meaningful existence by having a <sup>\*</sup> clear reason of what you want to do and how you want to achieve it.

*Check all that apply.*

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

10. Community Engagement: I practice communication, involvement, and collaboration with other people in and outside my school to affect a positive change at school and or at workplace.

*Check all that apply.*

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

11. Versatility: I know how to use Canva <sup>\*</sup>

*Check all that apply.*

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

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## 12. Mentoring: I receive a guidance on my course program \*

*Check all that apply.*

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

## 13. Learning Environment: I have a good learning environment / school facilities \*

*Check all that apply.*

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

## 14. Awareness: I am aware of the appropriate contacts in IT support to reach out to when facing technical issues with my laptop or device. \*

*Check all that apply.*

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

## 15. Financial Support: I am familiar with the financial support/s that NZSE offer \*

*Check all that apply.*

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly Disagree

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16. Accessibility : I can easily seek academic support / provide feedback through the Learner Voice Committee (class representatives) \*

*Check all that apply.*

- ☐ Strongly agree  
☐ Agree  
☐ Neutral  
☐ Disagree  
☐ Strongly Disagree

17. Acculturation: I can easily share any aspect of my culture with someone else who have different culture to me and vice versa \*

*Check all that apply.*

- ☐ Strongly agree  
☐ Agree  
☐ Neutral  
☐ Disagree  
☐ Strongly Disagree

### **Suggestion (Optional)**

18. Please suggest the specific support you require, not previously mentioned, to successfully attain your academic goal.

---

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***Thank you so much :)***

## Appendix 2

1/26/24, 6:34 PM

Student Hub: Guiding Students Towards Academic Achievement

## Student Hub: Guiding Students Towards Academic Achievement

30 responses

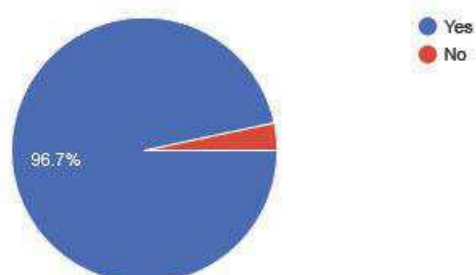
[Publish analytics](#)

I agree to participate in the research project and give consent to use my details.

[Copy](#)

*No name and contact details will be collected in this survey for data privacy. Rest assured that all your responses will be kept confidential and you will not be identified.*

30 responses

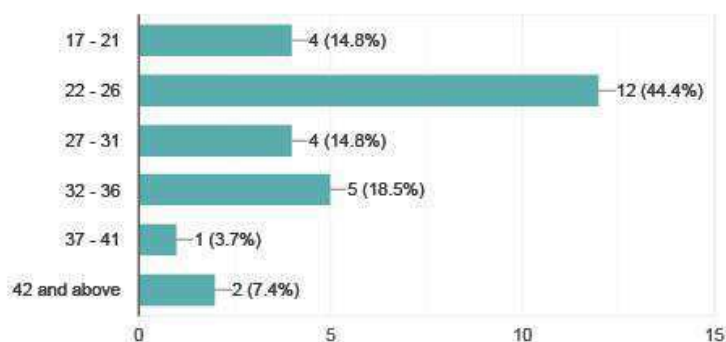


### Demographics

Age

[Copy](#)

27 responses



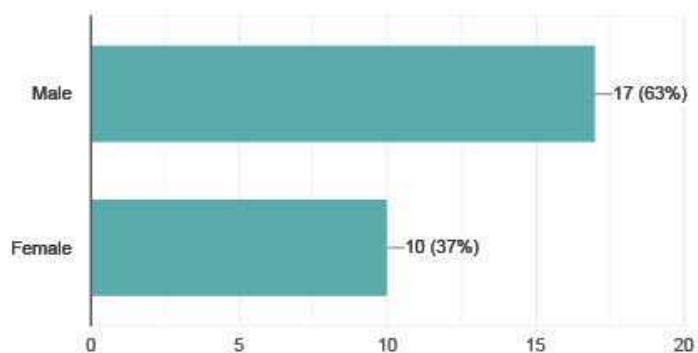
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Student Hub: Guiding Students Towards Academic Achievement

## Gender

 Copy

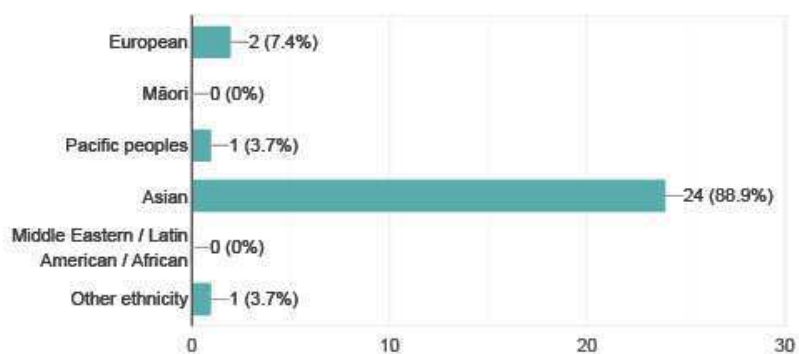
27 responses



## Ethnicity

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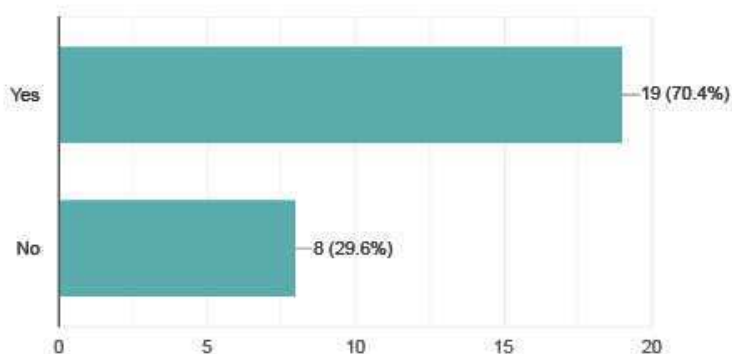
27 responses



## Are you enrolled in a scholarship program?

 Copy

27 responses

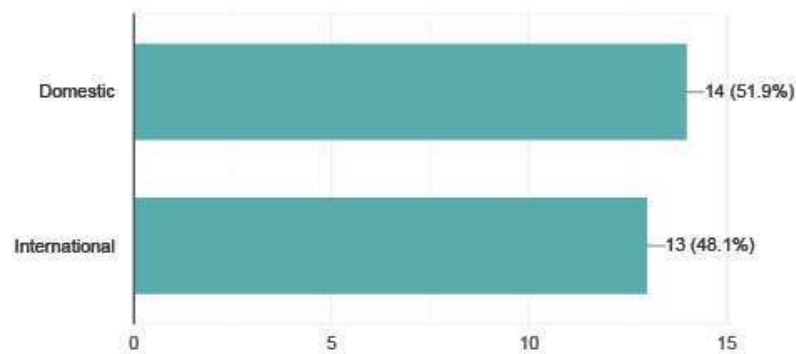


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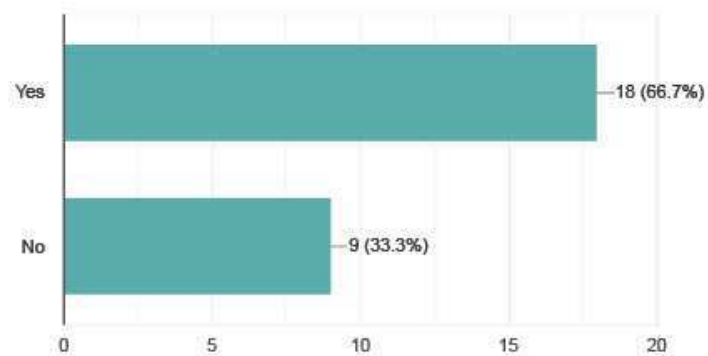
Student Hub: Guiding Students Towards Academic Achievement

**Type of Student** Copy

27 responses

**Program Awareness****Do you know the NZSE Student Hub Program?** Copy

27 responses

**Outcome**

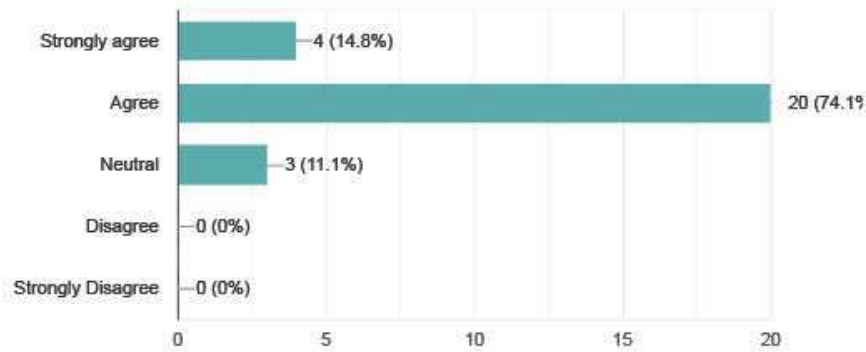
1/26/24, 6:34 PM

Student Hub: Guiding Students Towards Academic Achievement

Academic Achievement: I comprehend the lessons/course program easily and am confident that I can proficiently apply the knowledge gained in my future workplace.

 Copy

27 responses

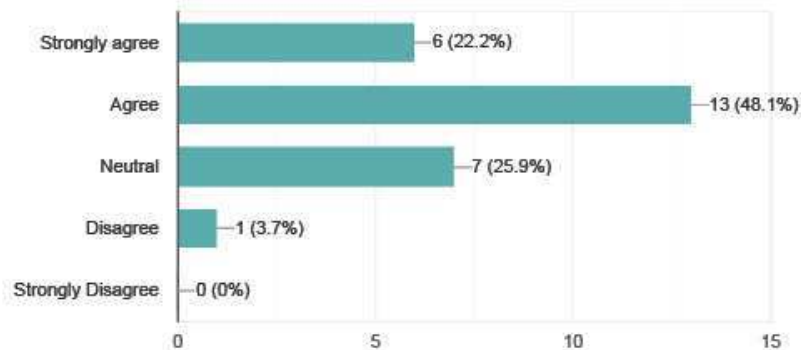


### Key Factors

Well-being : A positive aspect of satisfying and meaningful existence by having a clear reason of what you want to do and how you want to achieve it.

 Copy

27 responses





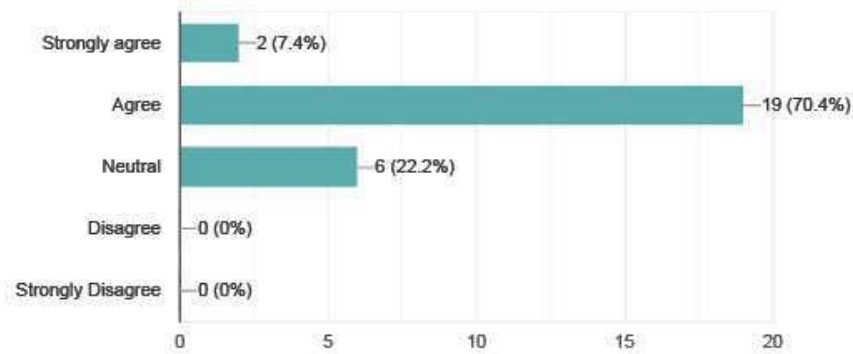
1/26/24, 6:34 PM

Student Hub: Guiding Students Towards Academic Achievement

Community Engagement: I practice communication, involvement, and collaboration with other people in and outside my school to affect a positive change at school and or at workplace.

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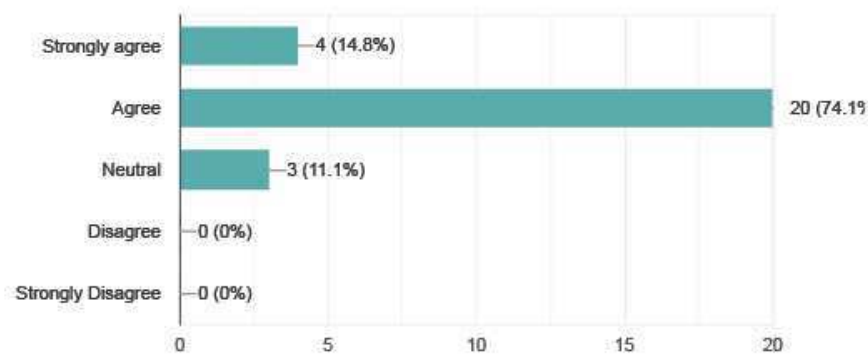
27 responses



Versatility: I know how to use Canva

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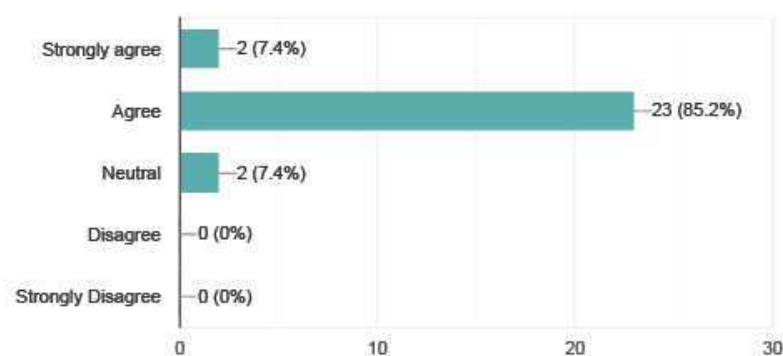
27 responses



Mentoring: I receive a guidance on my course program

 Copy

27 responses



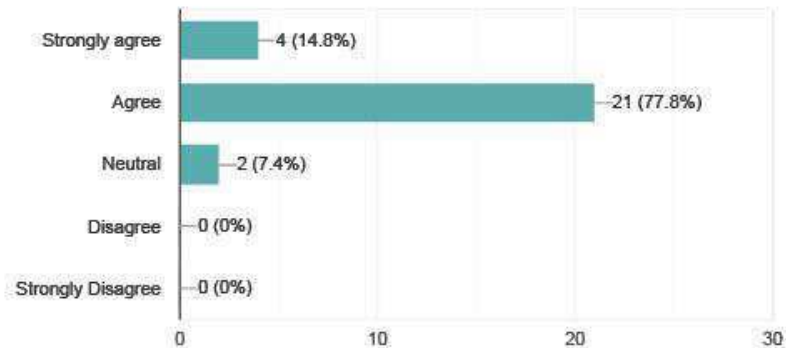
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Student Hub: Guiding Students Towards Academic Achievement

### Learning Environment: I have a good learning environment / school facilities

 Copy

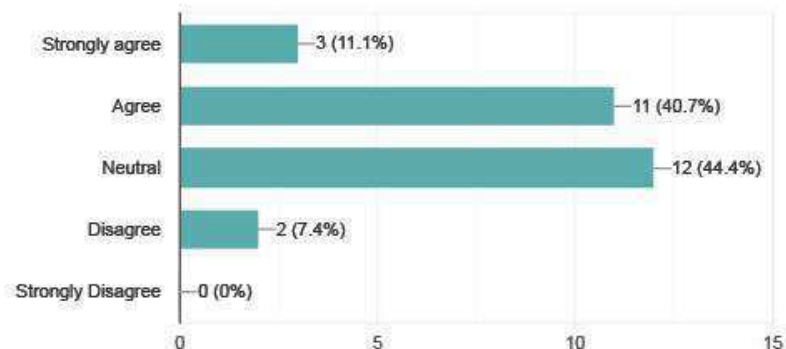
27 responses



### Awareness: I am aware of the appropriate contacts in IT support to reach out to when facing technical issues with my laptop or device.

 Copy

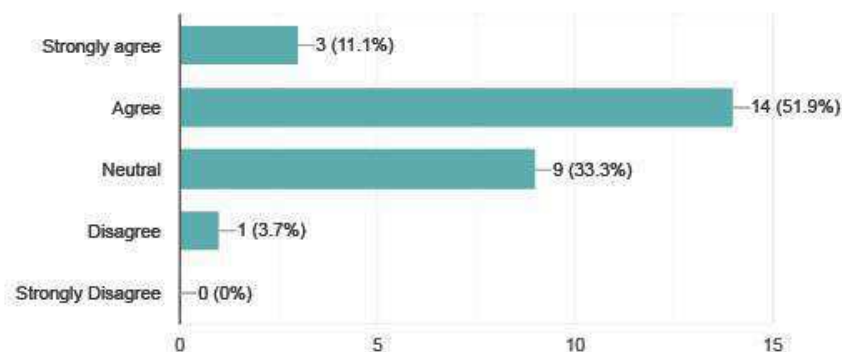
27 responses



### Financial Support: I am familiar with the financial support/s that NZSE offer

 Copy

27 responses



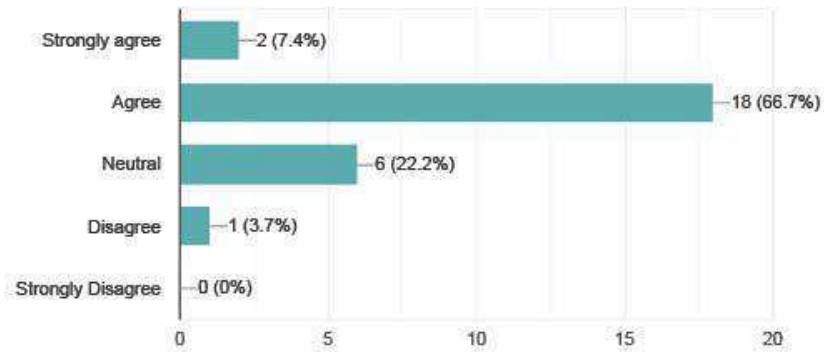
1/26/24, 6:34 PM

Student Hub: Guiding Students Towards Academic Achievement

Accessibility : I can easily seek academic support / provide feedback through the Learner Voice Committee (class representatives)

 Copy

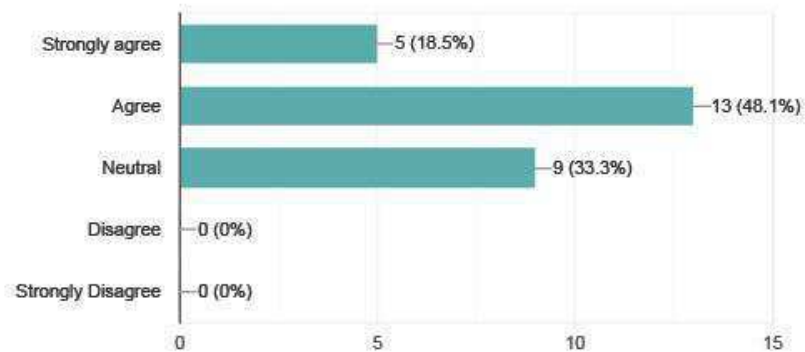
27 responses



Acculturation: I can easily share any aspect of my culture with someone else who have different culture to me and vice versa

 Copy

27 responses



**Suggestion (Optional)**



1/26/24, 6:34 PM

Student Hub: Guiding Students Towards Academic Achievement

Please suggest the specific support you require, not previously mentioned, to successfully attain your academic goal.

4 responses

n/a

y

N/A

na

***Thank you so much :)***

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Google Forms



```
In [1]: import pandas as pd  
import numpy as np  
import matplotlib.pyplot as plt  
import seaborn as sns
```

```
In [2]: raw_dataframe = pd.read_csv('_Questionnaire Responses - Raw Data.csv')
```

```
In [3]: raw_dataframe.head(100)
```

Out[3]:

I agree to participate in the research project and give consent to use my details. \n\nNo name and contact details will be collected in this survey for data privacy. Rest assured that all your responses will be kept confidential and you will not be identified.												
Timestamp		Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement: I comprehend the lessons/course program easily and am confident that I can proficiently apply the knowledge gained in my future workplace.	Well-being : A positive aspect of satisfying and meaningful existence by having a clear reason of what you want to do and how you want to achieve it.	Community Engagement: I practice communication, involvement, and collaboration with other people in and outside my school to affect a positive change at school and or at workplace.	Versatility I know how to use Can	
0	12/12/2023 19:19:04	No	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
1	12/12/2023 19:24:29	Yes	42 and above	Male	Asian	Yes	Domestic	No	Agree	Agree	Agree	Neutral
2	12/12/2023 19:29:54	Yes	42 and above	Male	European	Yes	Domestic	Yes	Strongly agree	Disagree	Neutral	Strongly agree
3	12/12/2023 19:54:16	Yes	32 - 36	Male	European	Yes	Domestic	Yes	Agree	Neutral	Neutral	Agree
4	12/13/2023 11:35:49	Yes	22 - 26	Male	Asian	No	International	No	Agree	Agree	Agree	Agree
5	12/13/2023 11:36:41	Yes	17 - 21	Male	Asian	Yes	International	No	Agree	Strongly agree	Strongly agree	Agree
6	12/13/2023 11:37:54	Yes	17 - 21	Male	Asian	Yes	International	No	Agree	Agree	Agree	Agree

7	12/13/2023 11:42:06	Yes	22 - 26	Male	Asian	No	International	No	Agree	Agree	Agree	Agree
8	12/13/2023 12:46:42	Yes	27 - 31	Male	Asian	No	International	No	Agree	Agree	Agree	Agree
9	1/15/2024 13:13:54	Yes	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Strongly agree	Strongly agree
10	1/15/2024 13:16:30	Yes	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Agree	Agree
11	1/15/2024 14:20:54	Yes	22 - 26	Male	Asian	Yes	International	Yes	Agree	Agree	Agree	Agree
12	1/15/2024 14:55:40	Yes	22 - 26	Male	Asian	Yes	International	No	Neutral	Neutral	Neutral	Neutral
13	1/15/2024 15:57:40	Yes	32 - 36	Male	Asian	Yes	Domestic	Yes	Agree	Neutral	Agree	Agree
14	1/15/2024 16:07:25	Yes	32 - 36	Female	Pacific peoples, Other ethnicity	Yes	Domestic	No	Agree	Neutral	Agree	Agree
15	1/15/2024 21:13:55	Yes	27 - 31	Male	Asian	Yes	Domestic	Yes	Strongly agree	Agree	Agree	Agree
16	1/16/2024 17:41:28	Yes	32 - 36	Female	Asian	Yes	Domestic	Yes	Neutral	Neutral	Agree	Strongly agree
17	1/17/2024 10:45:06	Yes	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
18	1/17/2024 14:47:59	Yes	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
19	1/17/2024 15:17:49	Yes	37 - 41	Female	Asian	Yes	Domestic	Yes	Strongly agree	Strongly agree	Agree	Agree
20	1/17/2024 17:33:59	Yes	17 - 21	Male	Asian	Yes	International	No	Agree	Agree	Agree	Neutral
21	1/17/2024 18:15:46	Yes	17 - 21	Male	Asian	Yes	Domestic	Yes	Agree	Agree	Agree	Agree
22	1/17/2024 22:08:19	Yes	22 - 26	Male	Asian	No	International	Yes	Agree	Agree	Agree	Agree
23	1/18/2024 13:34:43	Yes	22 - 26	Female	Asian	No	International	Yes	Agree	Agree	Neutral	Agree



<b>24</b>	1/18/2024 15:56:27	Yes	22 - 26	Female	Asian	Yes	Domestic	Yes	Strongly agree	Strongly agree	Agree	Strong agree
<b>25</b>	1/19/2024 12:42:54	Yes	27 - 31	Female	Asian	Yes	Domestic	Yes	Neutral	Agree	Neutral	Agree
<b>26</b>	1/19/2024 15:50:16	Yes	22 - 26	Male	Asian	No	International	Yes	Agree	Agree	Agree	Agree
<b>27</b>	1/19/2024 16:01:41	Yes	22 - 26	Female	Asian	No	International	Yes	Agree	Neutral	Agree	Agree
<b>28</b>	1/19/2024 16:05:07	Yes	27 - 31	Male	Asian	No	International	Yes	Agree	Neutral	Agree	Agree
<b>29</b>	1/19/2024 21:34:53	Yes	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Neutral	Agree

In [4]: raw\_dataframe.shape

Out[4]: (30, 19)

```
In [5]: raw_dataframe.isnull().sum()
```

```
Out[5]: Timestamp
0
I agree to participate in the research project and give consent to use my details. \n\nNo name and contact details will be collected in this survey for data privacy. Rest assured that all your responses will be kept confidential and you will not be identified.      0
Age
3
Gender
3
Ethnicity
3
Are you enrolled in a scholarship program?
3
Type of Student
3
Do you know the NZSE Student Hub Program?
3
Academic Achievement: I comprehend the lessons/course program easily and am confident that I can proficiently apply the knowledge gained in my future workplace.
3
Well-being : A positive aspect of satisfying and meaningful existence by having a clear reason of what you want to do and how you want to achieve it.
3
Community Engagement: I practice communication, involvement, and collaboration with other people in and outside my school to affect a positive change at school and or at workplace.
3
Versatility: I know how to use Canva
3
Mentoring: I receive a guidance on my course program
3
Learning Environment: I have a good learning environment / school facilities
3
Awareness: I am aware of the appropriate contacts in IT support to reach out to when facing technical issues with my laptop or device.
3
Financial Support: I am familiar with the financial support/s that NZSE offer
3
Accessibility : I can easily seek academic support / provide feedback through the Learner Voice Committee (class representatives)
3
Acculturation: I can easily share any aspect of my culture with someone else who have different culture to me and vi
```

ce versa

3

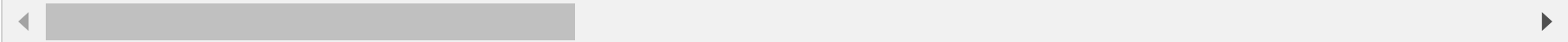
Please suggest the specific support you require, not previously mentioned, to successfully attain your academic goa

1.\n

28

dtype: int64

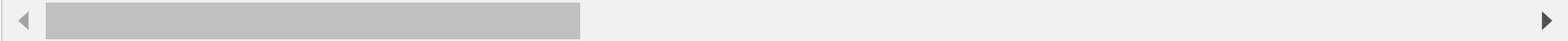
In [6]: `consent_response_df = raw_dataframe["I agree to participate in the research project and give consent to use my detail  
consent_response_df.head(100)`



Out[6]:

	I agree to participate in the research project and give consent to use my details. \n\nNo name and contact details will be collected in this survey for data privacy. Rest assured that all your responses will be kept confidential and you will not be identified.	count
0	Yes	29
1	No	1

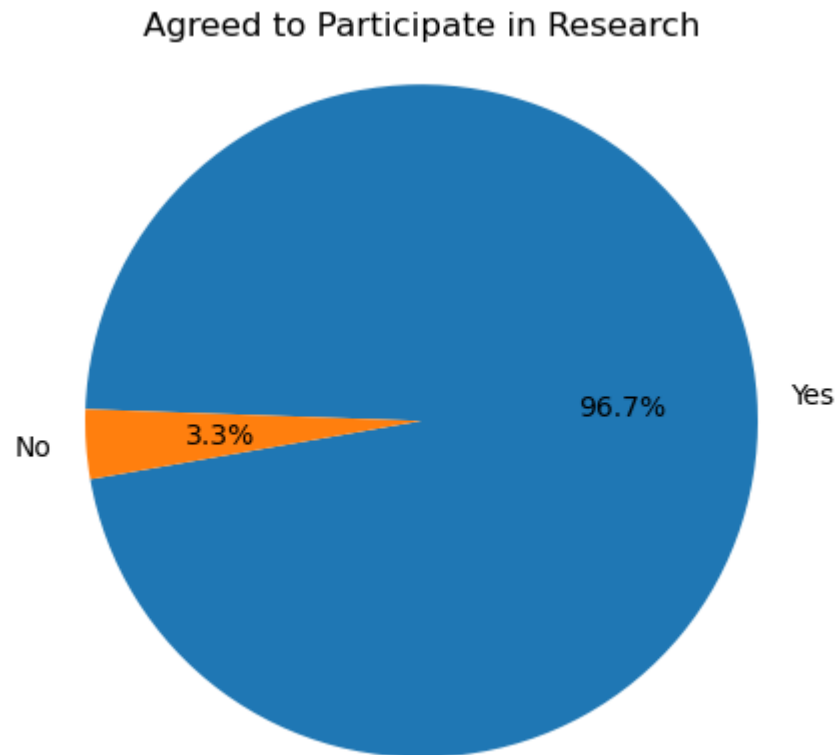
In [7]: `consent_response_df.rename(columns={'I agree to participate in the research project and give consent to use my detail  
consent_response_df.head(100)`



Out[7]:

	Consent	count
0	Yes	29
1	No	1

```
In [8]: # Pie chart
plt.pie(consent_response_df['count'], labels=consent_response_df['Consent'], autopct='%1.1f%%', startangle=190)
plt.axis('equal')
# Title
plt.title('Agreed to Participate in Research')
plt.show()
```



```
In [9]: # Due to technical error in google forms, 2 Yes responses were submitted without answering the survey.
# To correct the number of responses, I performed data cleaning to remove the unanswered surveys.
# The corrected total number of responds agreed to participate in the research is 26.
# The two yes responses with technical error and the one did not want to participate were removed.
cleaned_df = raw_dataframe.dropna(subset=['Age', 'Gender', 'Ethnicity', 'Are you enrolled in a scholarship program?', 'I agree to participate in the research project and give consent to use my details. \n\
cleaned_df = cleaned_df.drop(['I agree to participate in the research project and give consent to use my details. \n\

for column in cleaned_df.columns:
    if len(column.split(':')) > 1:
        new_column = column.split(":")[0].strip()
        cleaned_df.rename(columns={column: new_column}, inplace=True)

cleaned_df = cleaned_df.reset_index()
cleaned_df = cleaned_df.drop('index', axis=1)

cleaned_df.head(100)
```

Out[9]:

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awar
0	42 and above	Male	Asian	Yes	Domestic	No	Agree	Agree	Agree	Neutral	Agree	Agree	
1	42 and above	Male	European	Yes	Domestic	Yes	Strongly agree	Disagree	Neutral	Strongly agree	Strongly agree	Strongly agree	↑
2	32 - 36	Male	European	Yes	Domestic	Yes	Agree	Neutral	Neutral	Agree	Agree	Agree	S
3	22 - 26	Male	Asian	No	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
4	17 - 21	Male	Asian	Yes	International	No	Agree	Strongly agree	Strongly agree	Agree	Agree	Agree	
5	17 - 21	Male	Asian	Yes	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
6	22 - 26	Male	Asian	No	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
7	27 - 31	Male	Asian	No	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
8	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Strongly agree	Strongly agree	Agree	Agree	↑
9	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Agree	Agree	Strongly agree	Strongly agree	S
10	22 - 26	Male	Asian	Yes	International	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
11	22 - 26	Male	Asian	Yes	International	No	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	↑
12	32 - 36	Male	Asian	Yes	Domestic	Yes	Agree	Neutral	Agree	Agree	Agree	Agree	↑
13	32 - 36	Female	Pacific peoples, Other ethnicity	Yes	Domestic	No	Agree	Neutral	Agree	Agree	Agree	Agree	Di:

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awar
14	27 - 31	Male	Asian	Yes	Domestic	Yes	Strongly agree	Agree	Agree	Agree	Agree	Agree	
15	32 - 36	Female	Asian	Yes	Domestic	Yes	Neutral	Neutral	Agree	Strongly agree	Agree	Strongly agree	
16	37 - 41	Female	Asian	Yes	Domestic	Yes	Strongly agree	Strongly agree	Agree	Agree	Agree	Agree	↑
17	17 - 21	Male	Asian	Yes	International	No	Agree	Agree	Agree	Neutral	Neutral	Neutral	↑
18	17 - 21	Male	Asian	Yes	Domestic	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
19	22 - 26	Male	Asian	No	International	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
20	22 - 26	Female	Asian	No	International	Yes	Agree	Agree	Neutral	Agree	Agree	Agree	
21	22 - 26	Female	Asian	Yes	Domestic	Yes	Strongly agree	Strongly agree	Agree	Strongly agree	Agree	Agree	
22	27 - 31	Female	Asian	Yes	Domestic	Yes	Neutral	Agree	Neutral	Agree	Agree	Agree	Dis
23	22 - 26	Male	Asian	No	International	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
24	22 - 26	Female	Asian	No	International	Yes	Agree	Neutral	Agree	Agree	Agree	Agree	↑
25	27 - 31	Male	Asian	No	International	Yes	Agree	Neutral	Agree	Agree	Agree	Agree	↑
26	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Neutral	Agree	Agree	Strongly agree	S



```
In [10]: cleaned_df.shape
```

```
Out[10]: (27, 16)
```

```
In [11]: demographic_df = cleaned_df[['Age', 'Gender', 'Ethnicity', 'Are you enrolled in a scholarship program?', 'Type of Student']]
demographic_df.head(100)
```

Out[11]:

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student
0	42 and above	Male	Asian	Yes	Domestic
1	42 and above	Male	European	Yes	Domestic
2	32 - 36	Male	European	Yes	Domestic
3	22 - 26	Male	Asian	No	International
4	17 - 21	Male	Asian	Yes	International
5	17 - 21	Male	Asian	Yes	International
6	22 - 26	Male	Asian	No	International
7	27 - 31	Male	Asian	No	International
8	22 - 26	Female	Asian	Yes	Domestic
9	22 - 26	Female	Asian	Yes	Domestic
10	22 - 26	Male	Asian	Yes	International
11	22 - 26	Male	Asian	Yes	International
12	32 - 36	Male	Asian	Yes	Domestic
13	32 - 36	Female	Pacific peoples, Other ethnicity	Yes	Domestic
14	27 - 31	Male	Asian	Yes	Domestic
15	32 - 36	Female	Asian	Yes	Domestic
16	37 - 41	Female	Asian	Yes	Domestic
17	17 - 21	Male	Asian	Yes	International
18	17 - 21	Male	Asian	Yes	Domestic
19	22 - 26	Male	Asian	No	International
20	22 - 26	Female	Asian	No	International
21	22 - 26	Female	Asian	Yes	Domestic
22	27 - 31	Female	Asian	Yes	Domestic
23	22 - 26	Male	Asian	No	International
24	22 - 26	Female	Asian	No	International
25	27 - 31	Male	Asian	No	International

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student
26	22 - 26	Female	Asian	Yes	Domestic

In [12]: `demographic_df.isnull().sum()`

Out[12]:

Age	0
Gender	0
Ethnicity	0
Are you enrolled in a scholarship program?	0
Type of Student	0
dtype: int64	

In [13]: `demographic_df.shape`

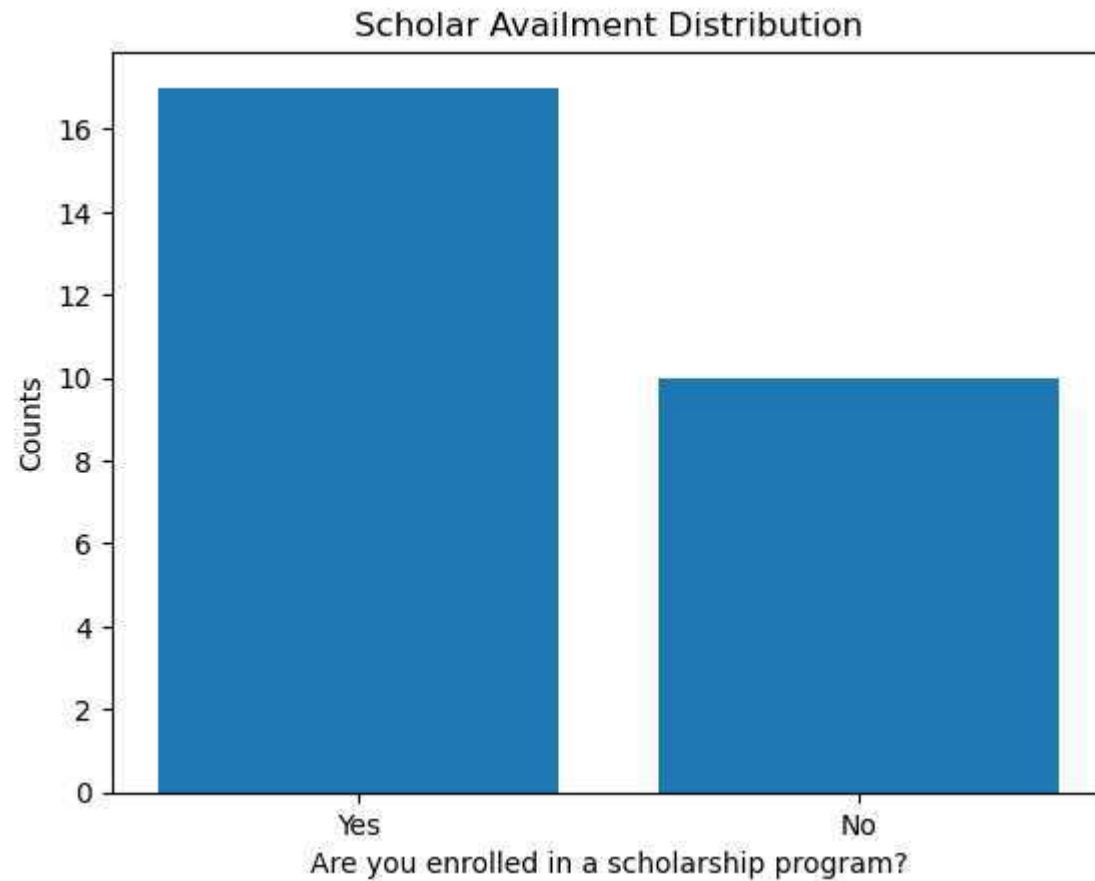
Out[13]: (27, 5)

In [54]: `enrolled_distribution_df = demographic_df['Are you enrolled in a scholarship program?'].value_counts().reset_index()  
enrolled_distribution_df.head(100)`

Out[54]:

	Are you enrolled in a scholarship program?	count
0	Yes	19
1	No	8

```
In [56]: # Plotting the bar chart
plt.bar(enrolled_distribution_df['Are you enrolled in a scholarship program?'], gender_distribution_df['count'])
plt.xlabel('Are you enrolled in a scholarship program?')
plt.ylabel('Counts')
plt.title('Scholar Availment Distribution')
plt.show()
```



```
In [14]: age_distribution_df = demographic_df['Age'].value_counts().reset_index()  
age_distribution_df.head(100)
```

```
Out[14]:
```

	Age	count
0	22 - 26	12
1	32 - 36	4
2	17 - 21	4
3	27 - 31	4
4	42 and above	2
5	37 - 41	1

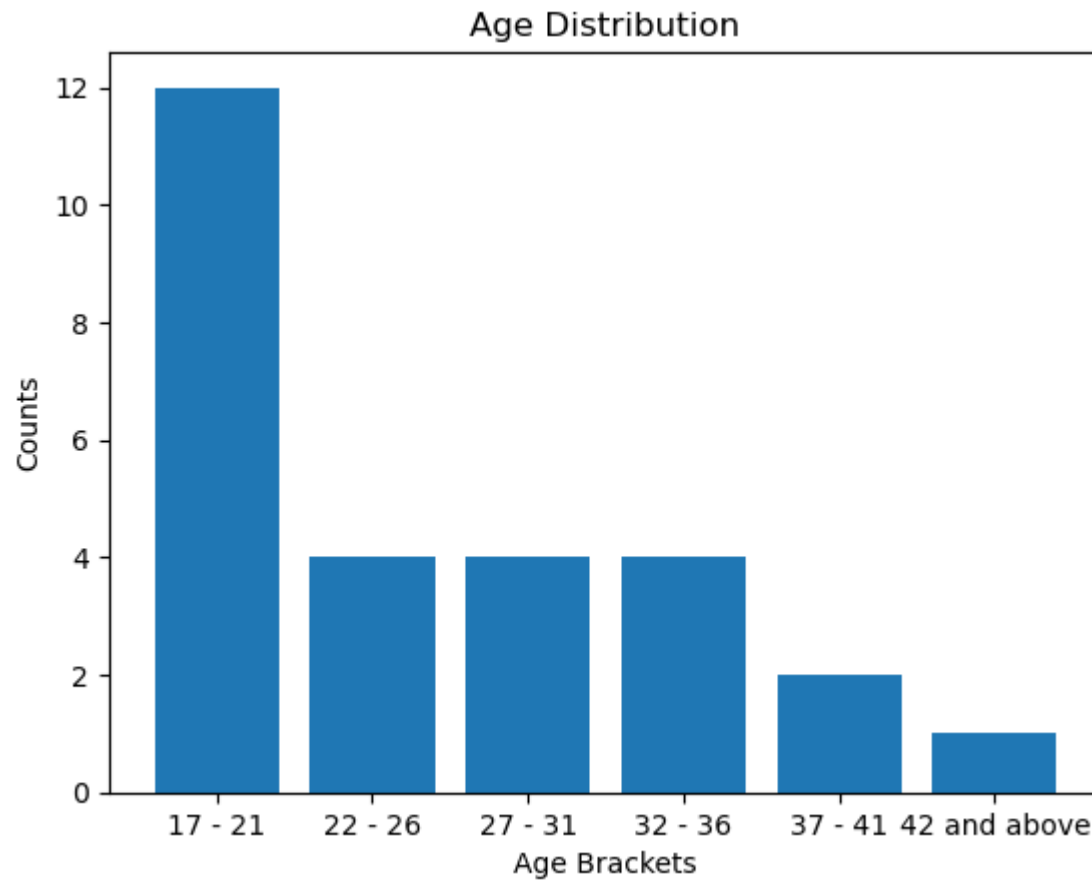
```
In [15]: age_distribution_df.shape
```

```
Out[15]: (6, 2)
```

```
In [16]: #Sort age bracket using lower bound in ascending order
def sort_age_distribution(value):
    # Extract the lower bound of the range and convert it to an integer
    if len(value.split('-')) > 1:
        return int(value.split('-')[0])
    elif len(value.split('and')) > 1:
        return int(value.split('and')[0])
    return value

sorted_age_bracket = sorted(age_distribution_df['Age'], key=sort_age_distribution)

# Plotting the bar chart
plt.bar(sorted_age_bracket, age_distribution_df['count'])
plt.xlabel('Age Brackets')
plt.ylabel('Counts')
plt.title('Age Distribution')
plt.show()
```



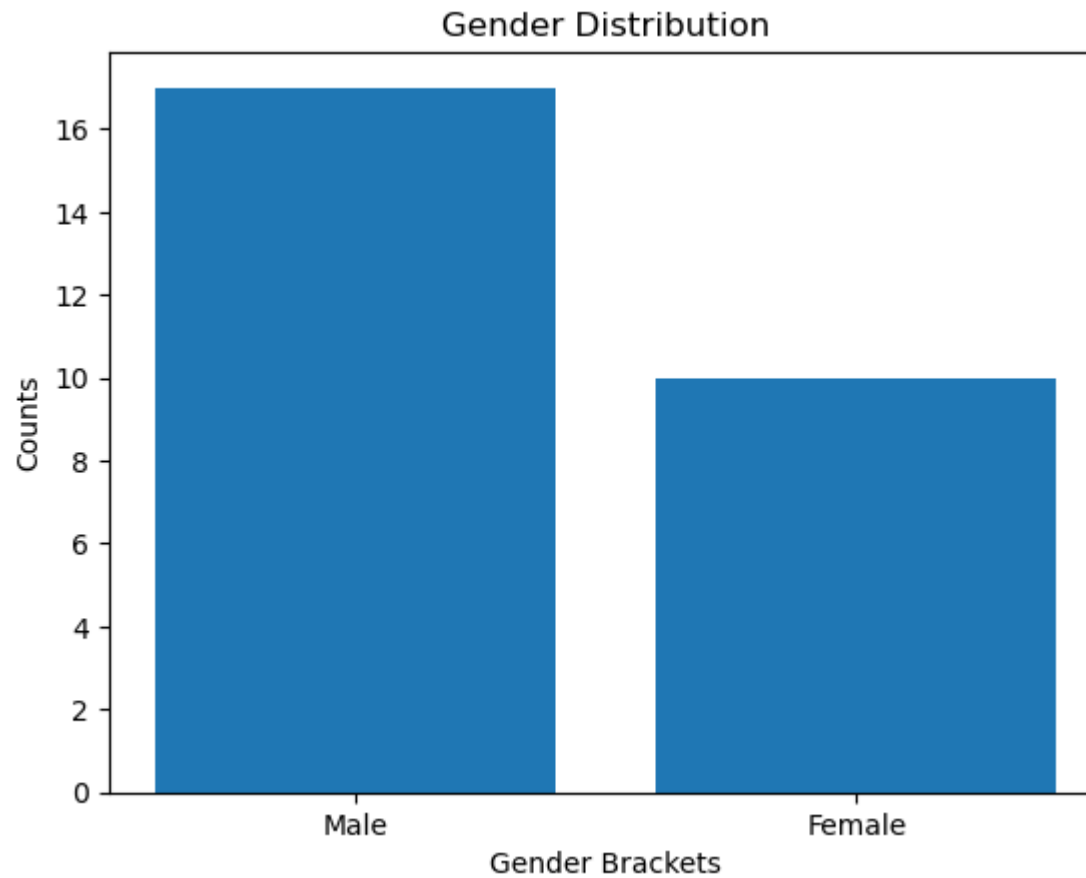
```
In [17]: gender_distribution_df = demographic_df['Gender'].value_counts().reset_index()
gender_distribution_df.head(100)
```

```
Out[17]:
```

	Gender	count
0	Male	17
1	Female	10



```
In [18]: # Plotting the bar chart
plt.bar(gender_distribution_df['Gender'], gender_distribution_df['count'])
plt.xlabel('Gender Brackets')
plt.ylabel('Counts')
plt.title('Gender Distribution')
plt.show()
```

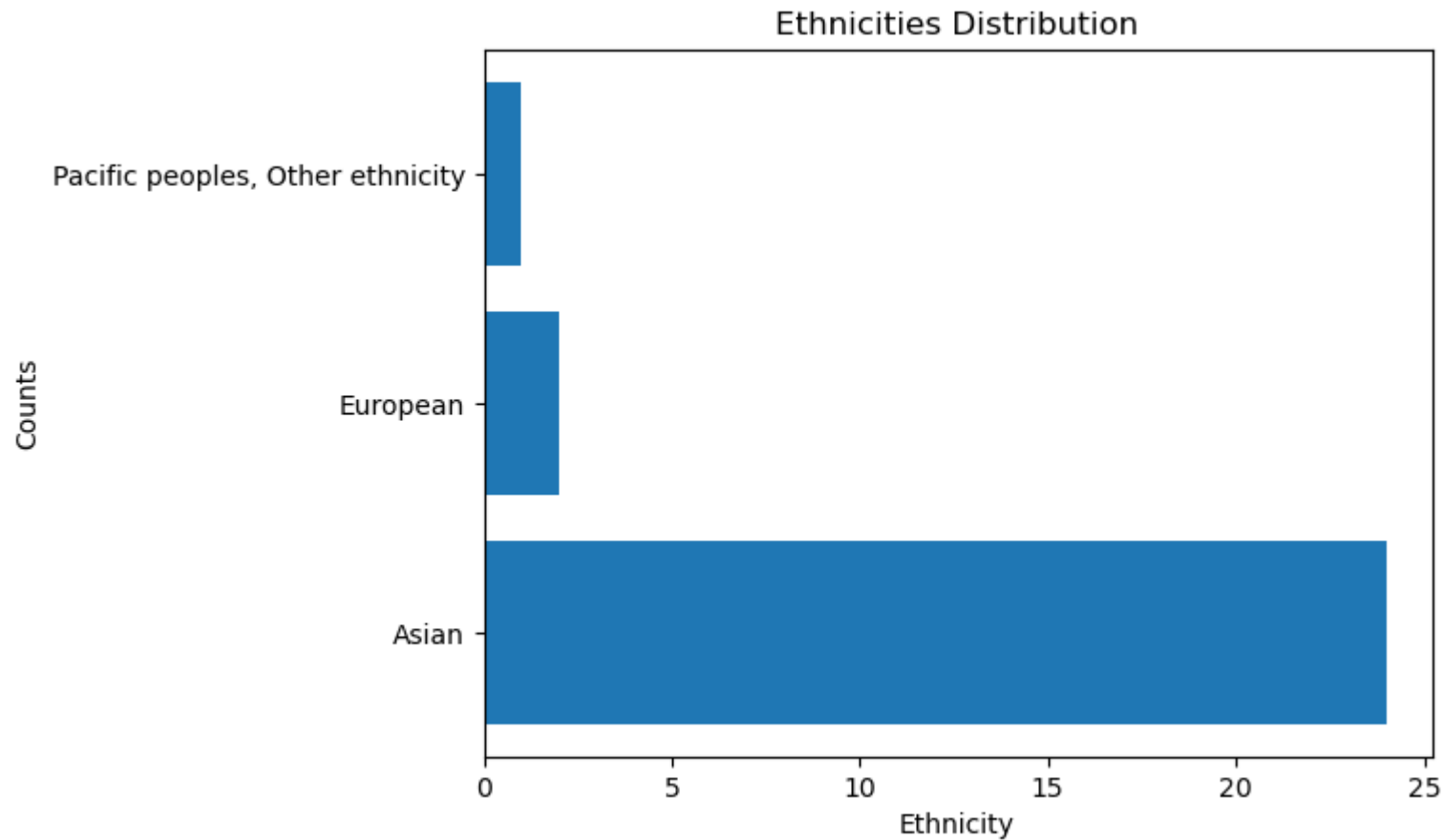


```
In [19]: ethnicity_distribution_df = demographic_df['Ethnicity'].value_counts().reset_index()
ethnicity_distribution_df.head(100)
```

Out[19]:

	Ethnicity	count
0	Asian	24
1	European	2
2	Pacific peoples, Other ethnicity	1

```
In [20]: # Plotting the bar chart
plt.barh(ethnicity_distribution_df['Ethnicity'], ethnicity_distribution_df['count'])
plt.xlabel('Ethnicity')
plt.ylabel('Counts')
plt.title('Ethnicities Distribution')
plt.show()
```

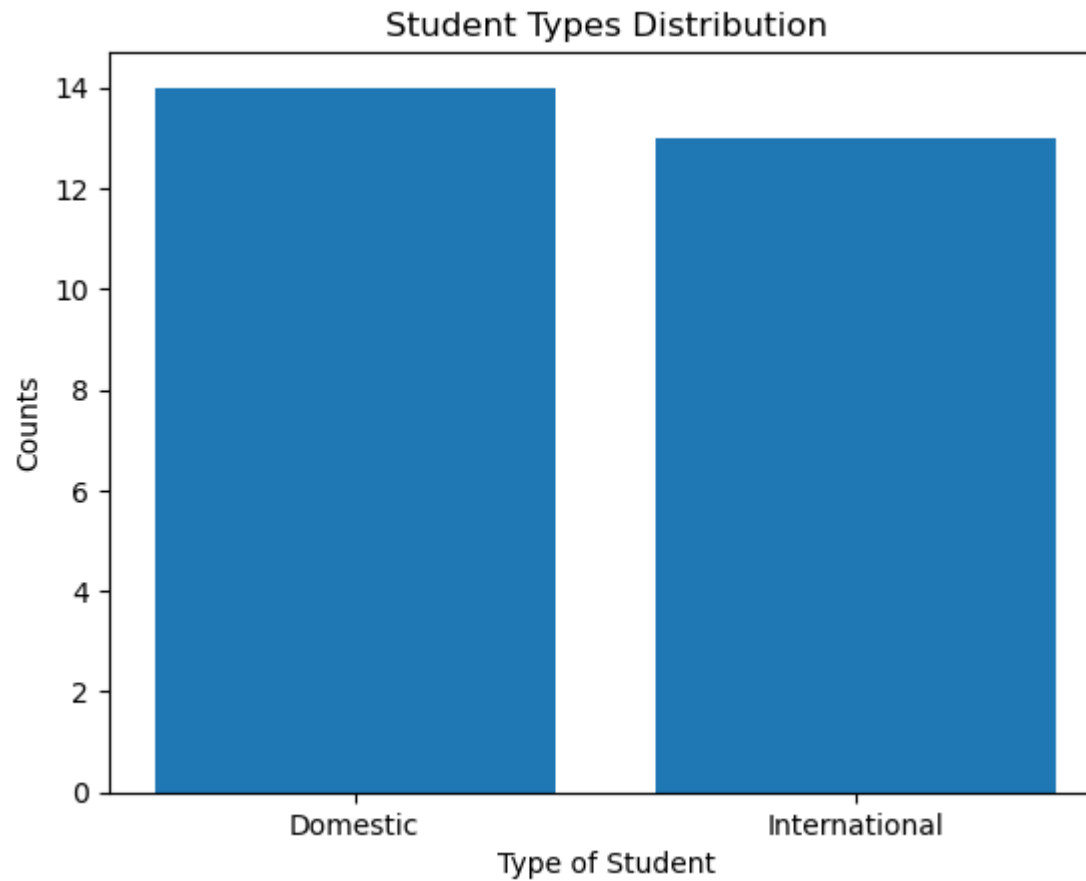


```
In [21]: typeofstudent_distribution_df = demographic_df['Type of Student'].value_counts().reset_index()
typeofstudent_distribution_df.head(100)
```

```
Out[21]:
```

	Type of Student	count
0	Domestic	14
1	International	13

```
In [22]: # Plotting the bar chart
plt.bar(typeofstudent_distribution_df['Type of Student'], typeofstudent_distribution_df['count'])
plt.xlabel('Type of Student')
plt.ylabel('Counts')
plt.title('Student Types Distribution')
plt.show()
```



```
In [23]: cleaned_df.head(100)
```

Out[23]:

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awar
0	42 and above	Male	Asian	Yes	Domestic	No	Agree	Agree	Agree	Neutral	Agree	Agree	
1	42 and above	Male	European	Yes	Domestic	Yes	Strongly agree	Disagree	Neutral	Strongly agree	Strongly agree	Strongly agree	↑
2	32 - 36	Male	European	Yes	Domestic	Yes	Agree	Neutral	Neutral	Agree	Agree	Agree	S
3	22 - 26	Male	Asian	No	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
4	17 - 21	Male	Asian	Yes	International	No	Agree	Strongly agree	Strongly agree	Agree	Agree	Agree	
5	17 - 21	Male	Asian	Yes	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
6	22 - 26	Male	Asian	No	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
7	27 - 31	Male	Asian	No	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
8	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Strongly agree	Strongly agree	Agree	Agree	↑
9	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Agree	Agree	Strongly agree	Strongly agree	S
10	22 - 26	Male	Asian	Yes	International	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
11	22 - 26	Male	Asian	Yes	International	No	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	↑
12	32 - 36	Male	Asian	Yes	Domestic	Yes	Agree	Neutral	Agree	Agree	Agree	Agree	↑
13	32 - 36	Female	Pacific peoples, Other ethnicity	Yes	Domestic	No	Agree	Neutral	Agree	Agree	Agree	Agree	Di:

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awar
14	27 - 31	Male	Asian	Yes	Domestic	Yes	Strongly agree	Agree	Agree	Agree	Agree	Agree	
15	32 - 36	Female	Asian	Yes	Domestic	Yes	Neutral	Neutral	Agree	Strongly agree	Agree	Strongly agree	
16	37 - 41	Female	Asian	Yes	Domestic	Yes	Strongly agree	Strongly agree	Agree	Agree	Agree	Agree	↑
17	17 - 21	Male	Asian	Yes	International	No	Agree	Agree	Agree	Neutral	Neutral	Neutral	↑
18	17 - 21	Male	Asian	Yes	Domestic	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
19	22 - 26	Male	Asian	No	International	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
20	22 - 26	Female	Asian	No	International	Yes	Agree	Agree	Neutral	Agree	Agree	Agree	
21	22 - 26	Female	Asian	Yes	Domestic	Yes	Strongly agree	Strongly agree	Agree	Strongly agree	Agree	Agree	
22	27 - 31	Female	Asian	Yes	Domestic	Yes	Neutral	Agree	Neutral	Agree	Agree	Agree	Dis
23	22 - 26	Male	Asian	No	International	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
24	22 - 26	Female	Asian	No	International	Yes	Agree	Neutral	Agree	Agree	Agree	Agree	↑
25	27 - 31	Male	Asian	No	International	Yes	Agree	Neutral	Agree	Agree	Agree	Agree	↑
26	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Neutral	Agree	Agree	Strongly agree	S



```
In [24]: encoded_df = cleaned_df.head(100)  
encoded_df
```

Out[24]:

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awar
0	42 and above	Male	Asian	Yes	Domestic	No	Agree	Agree	Agree	Neutral	Agree	Agree	
1	42 and above	Male	European	Yes	Domestic	Yes	Strongly agree	Disagree	Neutral	Strongly agree	Strongly agree	Strongly agree	↑
2	32 - 36	Male	European	Yes	Domestic	Yes	Agree	Neutral	Neutral	Agree	Agree	Agree	S
3	22 - 26	Male	Asian	No	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
4	17 - 21	Male	Asian	Yes	International	No	Agree	Strongly agree	Strongly agree	Agree	Agree	Agree	
5	17 - 21	Male	Asian	Yes	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
6	22 - 26	Male	Asian	No	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
7	27 - 31	Male	Asian	No	International	No	Agree	Agree	Agree	Agree	Agree	Agree	
8	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Strongly agree	Strongly agree	Agree	Agree	↑
9	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Agree	Agree	Strongly agree	Strongly agree	S
10	22 - 26	Male	Asian	Yes	International	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
11	22 - 26	Male	Asian	Yes	International	No	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	↑
12	32 - 36	Male	Asian	Yes	Domestic	Yes	Agree	Neutral	Agree	Agree	Agree	Agree	↑
13	32 - 36	Female	Pacific peoples, Other ethnicity	Yes	Domestic	No	Agree	Neutral	Agree	Agree	Agree	Agree	Di:

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awar
14	27 - 31	Male	Asian	Yes	Domestic	Yes	Strongly agree	Agree	Agree	Agree	Agree	Agree	
15	32 - 36	Female	Asian	Yes	Domestic	Yes	Neutral	Neutral	Agree	Strongly agree	Agree	Strongly agree	
16	37 - 41	Female	Asian	Yes	Domestic	Yes	Strongly agree	Strongly agree	Agree	Agree	Agree	Agree	↑
17	17 - 21	Male	Asian	Yes	International	No	Agree	Agree	Agree	Neutral	Neutral	Neutral	↑
18	17 - 21	Male	Asian	Yes	Domestic	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
19	22 - 26	Male	Asian	No	International	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
20	22 - 26	Female	Asian	No	International	Yes	Agree	Agree	Neutral	Agree	Agree	Agree	
21	22 - 26	Female	Asian	Yes	Domestic	Yes	Strongly agree	Strongly agree	Agree	Strongly agree	Agree	Agree	
22	27 - 31	Female	Asian	Yes	Domestic	Yes	Neutral	Agree	Neutral	Agree	Agree	Agree	Dis
23	22 - 26	Male	Asian	No	International	Yes	Agree	Agree	Agree	Agree	Agree	Agree	↑
24	22 - 26	Female	Asian	No	International	Yes	Agree	Neutral	Agree	Agree	Agree	Agree	↑
25	27 - 31	Male	Asian	No	International	Yes	Agree	Neutral	Agree	Agree	Agree	Agree	↑
26	22 - 26	Female	Asian	Yes	Domestic	Yes	Agree	Strongly agree	Neutral	Agree	Agree	Strongly agree	S

```
In [25]: # Transform Yes = 1, No = 0 for I agree to participate in the research project and give consent to use my details.
# No name and contact details will be collected in this survey for data privacy.
# Rest assured that all your responses will be kept confidential and you will not be identified.
yes_no_map = {'Yes': 1, 'No' : 0}
yes_no_columns = [
    'Are you enrolled in a scholarship program?',
    'Do you know the NZSE Student Hub Program?'
]
for column in yes_no_columns:
    encoded_df[column] = encoded_df[column].map(yes_no_map)

# Transform Male = 1, Female = 0 for Gender
male_female_map = {'Male': 1, 'Female' : 0}
encoded_df['Gender'] = encoded_df['Gender'].map(male_female_map)

# Transform Domestic = 0, International = 1 for Type of Student
type_of_student_map = {'International': 1, 'Domestic' : 0}
encoded_df['Type of Student'] = encoded_df['Type of Student'].map(type_of_student_map)

sorted_age_bracket = sorted(age_distribution_df['Age'], key=sort_age_distribution)
age_map = {}
index = 1
for age in sorted_age_bracket:
    age_map[age] = index
    index+=1

encoded_df['Age'] = encoded_df['Age'].map(age_map)

encoded_df.head(100)
```

Out[25]:

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awareness
0	6	1	Asian	1	0	0	Agree	Agree	Agree	Neutral	Agree	Agree	Agree
1	6	1	European	1	0	1	Strongly agree	Disagree	Neutral	Strongly agree	Strongly agree	Strongly agree	Neutra
2	4	1	European	1	0	1	Agree	Neutral	Neutral	Agree	Agree	Agree	Strongly agree
3	2	1	Asian	0	1	0	Agree	Agree	Agree	Agree	Agree	Agree	Agree
4	1	1	Asian	1	1	0	Agree	Strongly agree	Strongly agree	Agree	Agree	Agree	Agree
5	1	1	Asian	1	1	0	Agree	Agree	Agree	Agree	Agree	Agree	Agree
6	2	1	Asian	0	1	0	Agree	Agree	Agree	Agree	Agree	Agree	Agree
7	3	1	Asian	0	1	0	Agree	Agree	Agree	Agree	Agree	Agree	Agree
8	2	0	Asian	1	0	1	Agree	Strongly agree	Strongly agree	Strongly agree	Agree	Agree	Neutra
9	2	0	Asian	1	0	1	Agree	Strongly agree	Agree	Agree	Strongly agree	Strongly agree	Strongly agree
10	2	1	Asian	1	1	1	Agree	Agree	Agree	Agree	Agree	Agree	Neutra
11	2	1	Asian	1	1	0	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutra
12	4	1	Asian	1	0	1	Agree	Neutral	Agree	Agree	Agree	Agree	Neutra
13	4	0	Pacific peoples, Other ethnicity	1	0	0	Agree	Neutral	Agree	Agree	Agree	Agree	Disagree
14	3	1	Asian	1	0	1	Strongly agree	Agree	Agree	Agree	Agree	Agree	Agree
15	4	0	Asian	1	0	1	Neutral	Neutral	Agree	Strongly agree	Agree	Strongly agree	Agree
16	5	0	Asian	1	0	1	Strongly agree	Strongly agree	Agree	Agree	Agree	Agree	Neutra

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awareness
<b>17</b>	1	1	Asian	1	1	0	Agree	Agree	Agree	Neutral	Neutral	Neutral	Neutral
<b>18</b>	1	1	Asian	1	0	1	Agree	Agree	Agree	Agree	Agree	Agree	Neutral
<b>19</b>	2	1	Asian	0	1	1	Agree	Agree	Agree	Agree	Agree	Agree	Neutral
<b>20</b>	2	0	Asian	0	1	1	Agree	Agree	Neutral	Agree	Agree	Agree	Agree
<b>21</b>	2	0	Asian	1	0	1	Strongly agree	Strongly agree	Agree	Strongly agree	Agree	Agree	Agree
<b>22</b>	3	0	Asian	1	0	1	Neutral	Agree	Neutral	Agree	Agree	Agree	Disagree
<b>23</b>	2	1	Asian	0	1	1	Agree	Agree	Agree	Agree	Agree	Agree	Neutral
<b>24</b>	2	0	Asian	0	1	1	Agree	Neutral	Agree	Agree	Agree	Agree	Neutral
<b>25</b>	3	1	Asian	0	1	1	Agree	Neutral	Agree	Agree	Agree	Agree	Neutral
<b>26</b>	2	0	Asian	1	0	1	Agree	Strongly agree	Neutral	Agree	Agree	Strongly agree	Strongly agree Agree

```
In [26]: encoded_df = pd.get_dummies(encoded_df, columns=['Ethnicity'])
encoded_df.replace({True : 1, False: 0}, inplace=True)
encoded_df.head(100)
```

Out[26]:

	Age	Gender	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awareness	Financial Support
0	6	1	1	0	0	Agree	Agree	Agree	Neutral	Agree	Agree	Agree	Neutral
1	6	1	1	0	1	Strongly agree	Disagree	Neutral	Strongly agree	Strongly agree	Strongly agree	Neutral	Agree
2	4	1	1	0	1	Agree	Neutral	Neutral	Agree	Agree	Agree	Strongly agree	Agree
3	2	1	0	1	0	Agree	Agree	Agree	Agree	Agree	Agree	Agree	Agree
4	1	1	1	1	0	Agree	Strongly agree	Strongly agree	Agree	Agree	Agree	Agree	Neutral
5	1	1	1	1	0	Agree	Agree	Agree	Agree	Agree	Agree	Agree	Agree
6	2	1	0	1	0	Agree	Agree	Agree	Agree	Agree	Agree	Agree	Agree
7	3	1	0	1	0	Agree	Agree	Agree	Agree	Agree	Agree	Agree	Agree
8	2	0	1	0	1	Agree	Strongly agree	Strongly agree	Strongly agree	Agree	Agree	Neutral	Neutral
9	2	0	1	0	1	Agree	Strongly agree	Agree	Agree	Strongly agree	Strongly agree	Strongly agree	Strongly agree
10	2	1	1	1	1	Agree	Agree	Agree	Agree	Agree	Agree	Neutral	Agree
11	2	1	1	1	0	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
12	4	1	1	0	1	Agree	Neutral	Agree	Agree	Agree	Agree	Neutral	Agree
13	4	0	1	0	0	Agree	Neutral	Agree	Agree	Agree	Agree	Disagree	Disagree
14	3	1	1	0	1	Strongly agree	Agree	Agree	Agree	Agree	Agree	Agree	Agree
15	4	0	1	0	1	Neutral	Neutral	Agree	Strongly agree	Agree	Strongly agree	Agree	Agree
16	5	0	1	0	1	Strongly agree	Strongly agree	Agree	Agree	Agree	Agree	Neutral	Agree
17	1	1	1	1	0	Agree	Agree	Agree	Neutral	Neutral	Neutral	Neutral	Neutral



	Age	Gender	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awareness	Financial Support
18	1	1	1	0	1	Agree	Agree	Agree	Agree	Agree	Agree	Neutral	Neutral
19	2	1	0	1	1	Agree	Agree	Agree	Agree	Agree	Agree	Neutral	Neutral
20	2	0	0	1	1	Agree	Agree	Neutral	Agree	Agree	Agree	Agree	Neutral
21	2	0	1	0	1	Strongly agree	Strongly agree	Agree	Strongly agree	Agree	Agree	Agree	Strongly agree
22	3	0	1	0	1	Neutral	Agree	Neutral	Agree	Agree	Agree	Disagree	Agree
23	2	1	0	1	1	Agree	Agree	Agree	Agree	Agree	Agree	Neutral	Agree
24	2	0	0	1	1	Agree	Neutral	Agree	Agree	Agree	Agree	Neutral	Neutral
25	3	1	0	1	1	Agree	Neutral	Agree	Agree	Agree	Agree	Neutral	Agree
26	2	0	1	0	1	Agree	Strongly agree	Neutral	Agree	Agree	Strongly agree	Strongly agree, Agree	Strongly agree

In [27]: *# Mapping for Likert scale labels*

```
likert_mapping = {
    "Strongly Disagree": 1,
    "Disagree": 2,
    "Neutral": 3,
    "Agree": 4,
    "Strongly agree": 5,
    "Strongly agree, Agree": 5,
}
```

*# Apply mapping to Likert scale columns*

```
likert_columns = [col for col in encoded_df.columns]
encoded_df[likert_columns] = encoded_df[likert_columns].applymap(lambda x: likert_mapping.get(x, x))
```

In [28]: encoded\_df

Out[28]:

	Age	Gender	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awareness	Financial Support
0	6	1	1	0	0	4	4	4	3	4	4	4	3
1	6	1	1	0	1	5	2	3	5	5	5	3	4
2	4	1	1	0	1	4	3	3	4	4	4	5	4
3	2	1	0	1	0	4	4	4	4	4	4	4	4
4	1	1	1	1	0	4	5	5	4	4	4	4	3
5	1	1	1	1	0	4	4	4	4	4	4	4	4
6	2	1	0	1	0	4	4	4	4	4	4	4	4
7	3	1	0	1	0	4	4	4	4	4	4	4	4
8	2	0	1	0	1	4	5	5	5	4	4	3	3
9	2	0	1	0	1	4	5	4	4	5	5	5	5
10	2	1	1	1	1	4	4	4	4	4	4	3	4
11	2	1	1	1	0	3	3	3	3	3	3	3	3
12	4	1	1	0	1	4	3	4	4	4	4	3	4
13	4	0	1	0	0	4	3	4	4	4	4	2	2
14	3	1	1	0	1	5	4	4	4	4	4	4	4
15	4	0	1	0	1	3	3	4	5	4	5	4	4
16	5	0	1	0	1	5	5	4	4	4	4	3	4
17	1	1	1	1	0	4	4	4	3	3	3	3	3
18	1	1	1	0	1	4	4	4	4	4	4	3	3
19	2	1	0	1	1	4	4	4	4	4	4	3	3
20	2	0	0	1	1	4	4	3	4	4	4	4	3
21	2	0	1	0	1	5	5	4	5	4	4	4	5
22	3	0	1	0	1	3	4	3	4	4	4	2	4

	Age	Gender	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awareness	Financial Support
<b>23</b>	2	1	0	1	1	4	4	4	4	4	4	3	4
<b>24</b>	2	0	0	1	1	4	3	4	4	4	4	3	3
<b>25</b>	3	1	0	1	1	4	3	4	4	4	4	3	4
<b>26</b>	2	0	1	0	1	4	5	3	4	4	5	5	5

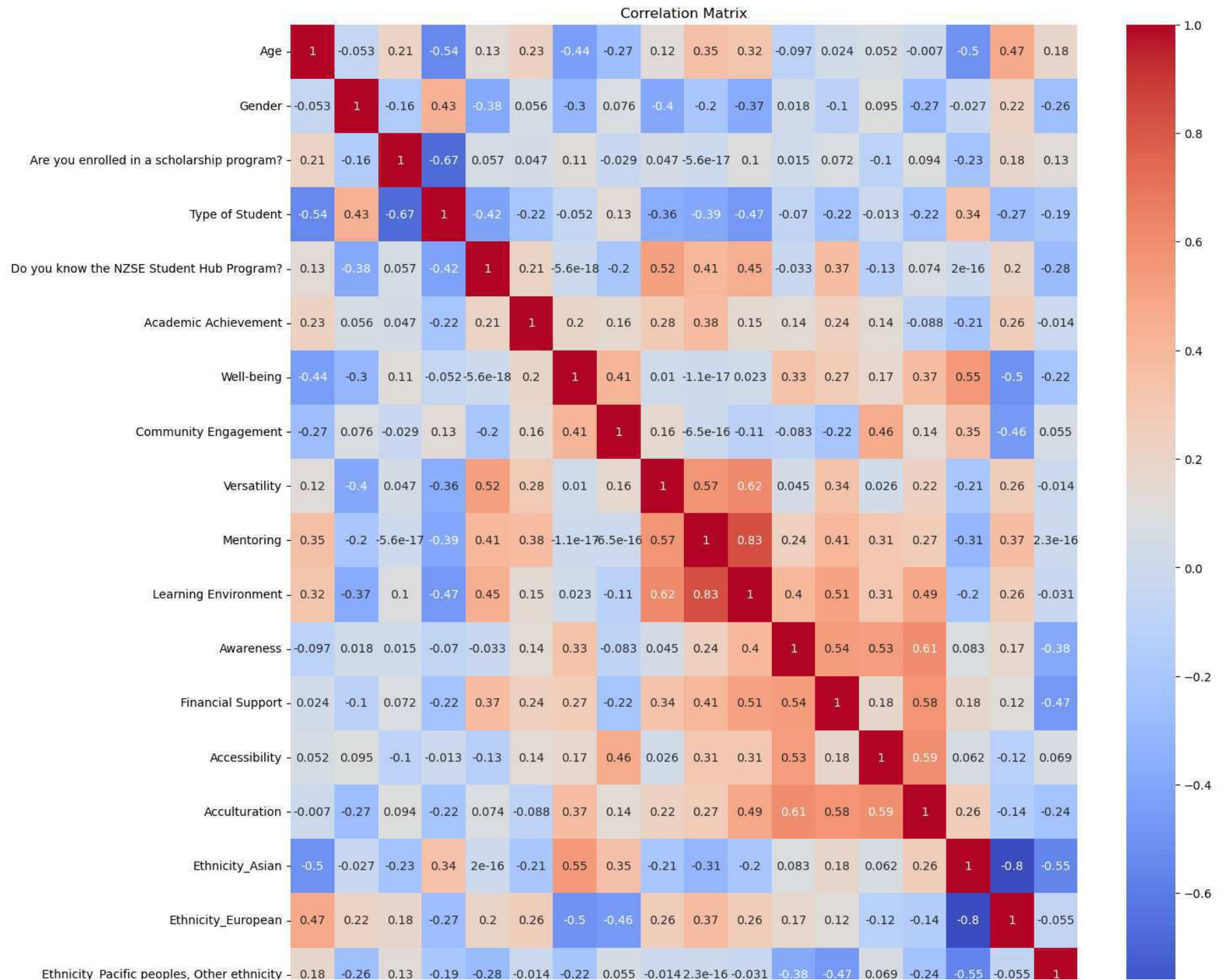
```
In [29]: # Calculate correlation matrix
correlation_matrix = encoded_df.corr()

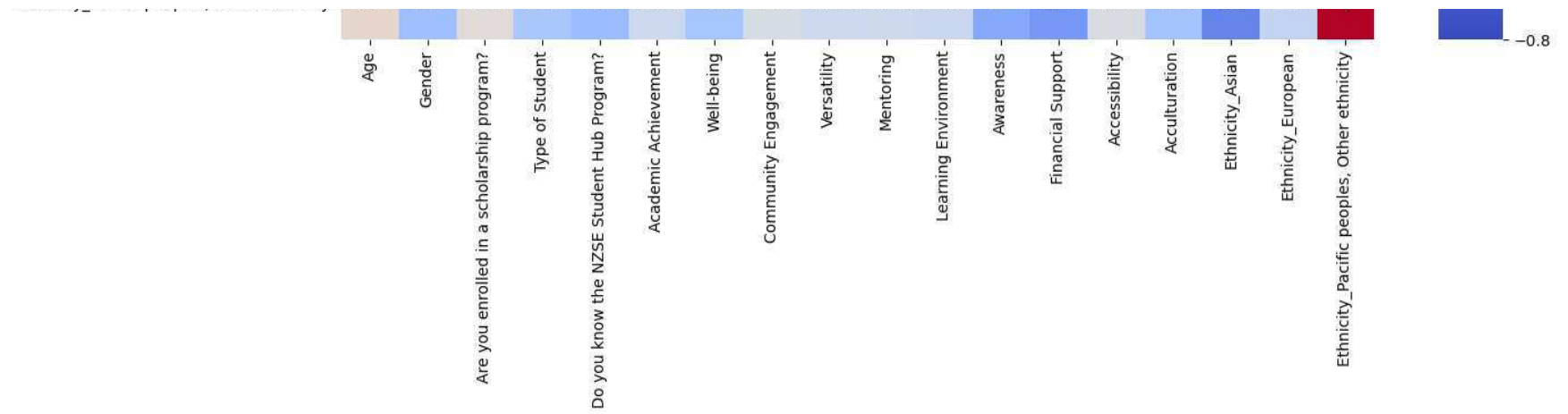
# Set up the matplotlib figure
plt.figure(figsize=(15, 15))

# Draw the heatmap with the mask and correct aspect ratio
sns.heatmap(correlation_matrix, annot=True, cmap="coolwarm")

# Show the plot
plt.title("Correlation Matrix")
plt.show()
```





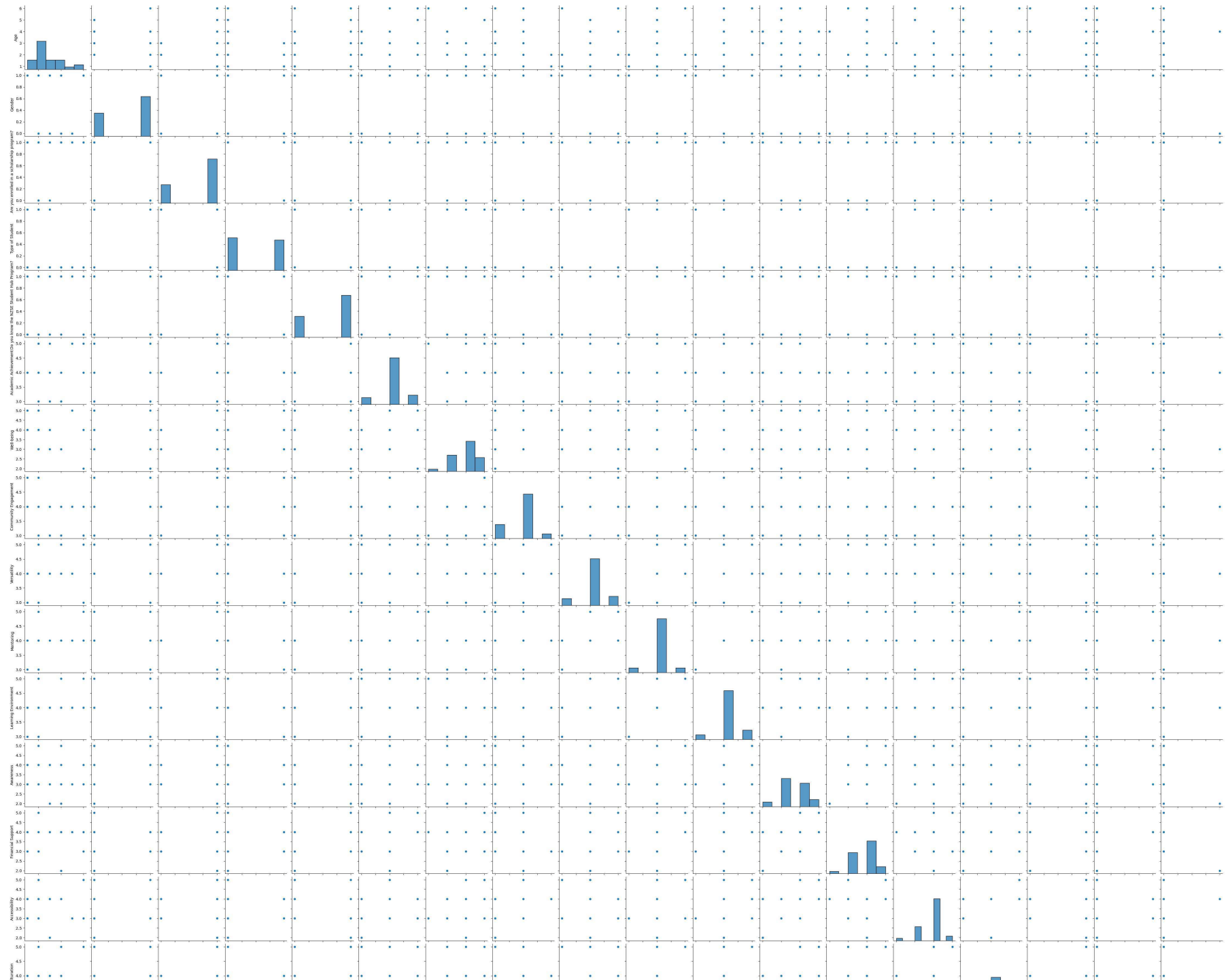


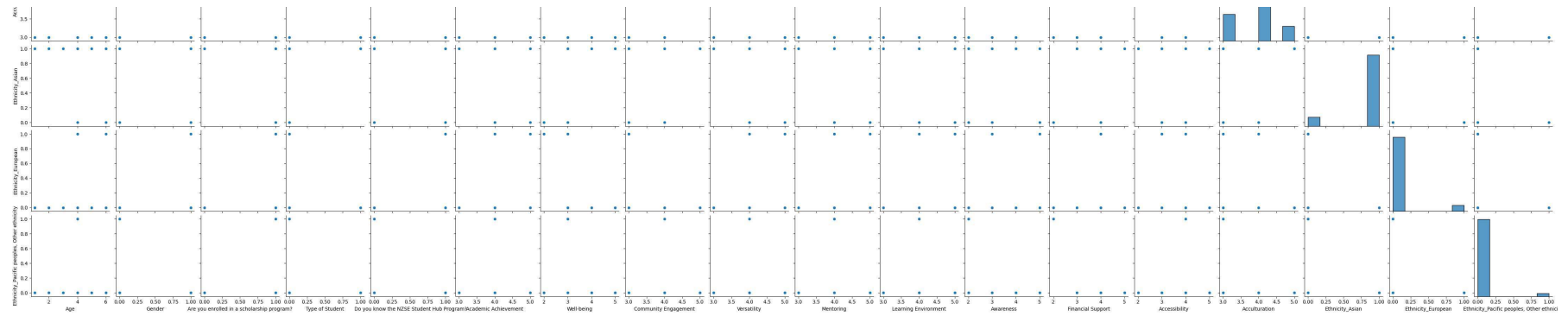


```
In [30]: sns.pairplot(encoded_df)  
plt.show()
```

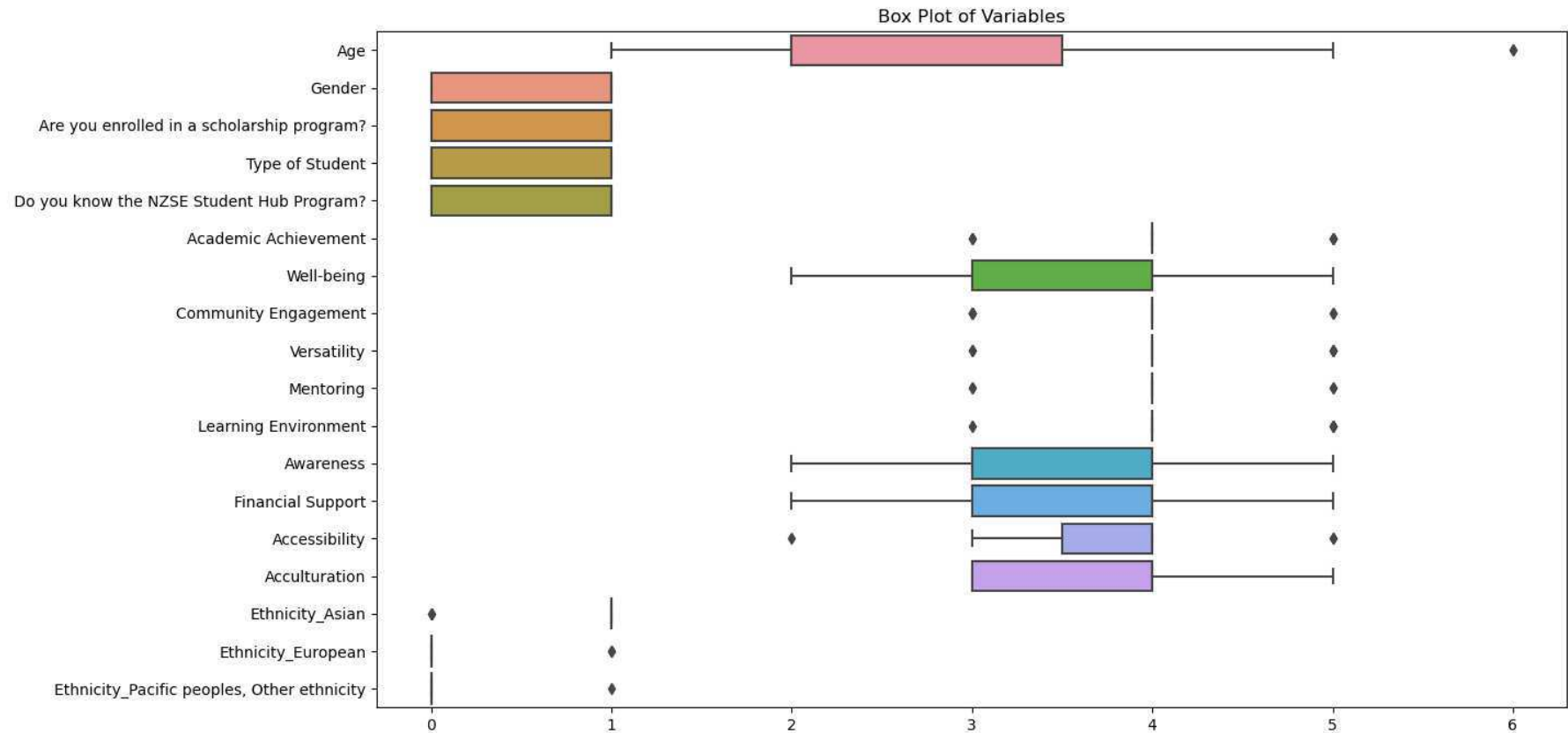
```
C:\Users\torri\anaconda3\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning: The figure layout has changed to tight  
self._figure.tight_layout(*args, **kwargs)
```







```
In [31]: plt.figure(figsize=(14, 8))  
sns.boxplot(data=encoded_df, orient="h")  
plt.title("Box Plot of Variables")  
plt.show()
```



```
In [32]: # Correlation matrix
correlation_matrix = encoded_df.corr()

# Correlations with 'Academic Performance'
academic_achievement_correlations = correlation_matrix['Academic Achievement'].sort_values(ascending=False)

# Display the correlations
print("Correlations with Academic Achievement:")
print(academic_achievement_correlations)

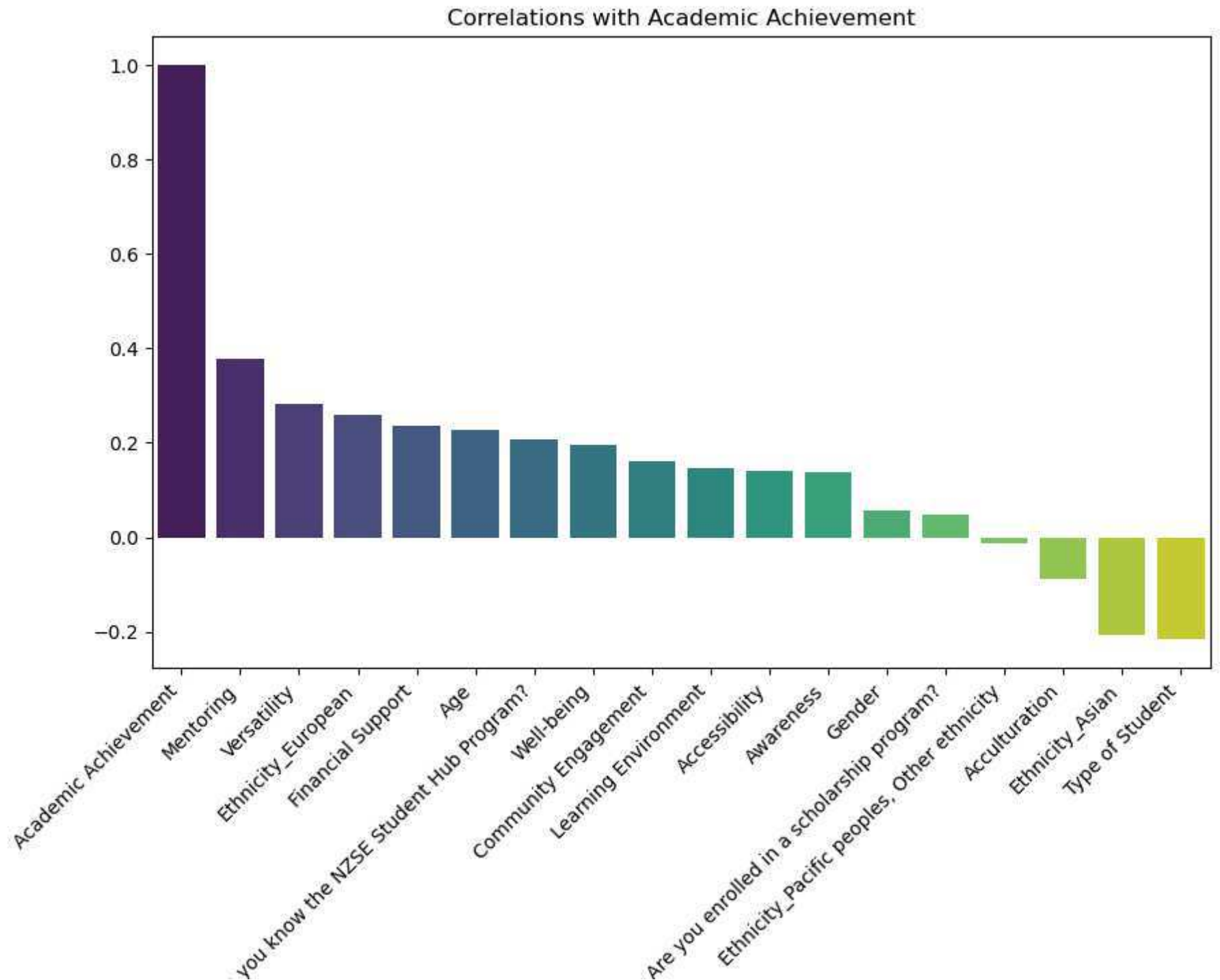
# Plot the correlations
plt.figure(figsize=(10, 6))
sns.barplot(x=academic_achievement_correlations.index, y=academic_achievement_correlations.values, palette="viridis")
plt.xticks(rotation=45, ha="right")
plt.title("Correlations with Academic Achievement")
plt.show()
```

Correlations with Academic Achievement:

Academic Achievement	1.000000
Mentoring	0.378968
Versatility	0.281915
Ethnicity_European	0.257855
Financial Support	0.235716
Age	0.226594
Do you know the NZSE Student Hub Program?	0.206284
Well-being	0.195970
Community Engagement	0.159870
Learning Environment	0.145055
Accessibility	0.141820
Awareness	0.137218
Gender	0.055937
Are you enrolled in a scholarship program?	0.047325
Ethnicity_Pacific peoples, Other ethnicity	-0.014303
Acculturation	-0.088165
Ethnicity_Asian	-0.206284
Type of Student	-0.216245

Name: Academic Achievement, dtype: float64







```
In [33]: # Basic statistics for numerical variables
numerical_summary = encoded_df.describe()
print("Numerical Summary:")
print(numerical_summary)

# Frequency counts for categorical variables
categorical_summary = cleaned_df.describe(include='O')
print("\nCategorical Summary:")
print(categorical_summary)

# Unique values for each categorical variable
print("\nUnique Values for Categorical Variables:")
for column in cleaned_df.select_dtypes(include='O').columns:
    unique_values = cleaned_df[column].unique()
    print(f"{column}: {unique_values}")
```

Numerical Summary:

	Age	Gender	Are you enrolled in a scholarship program? \
count	27.000000	27.000000	27.000000
mean	2.703704	0.629630	0.703704
std	1.409168	0.492103	0.465322
min	1.000000	0.000000	0.000000
25%	2.000000	0.000000	0.000000
50%	2.000000	1.000000	1.000000
75%	3.500000	1.000000	1.000000
max	6.000000	1.000000	1.000000

	Type of Student	Do you know the NZSE Student Hub Program? \
count	27.000000	27.000000
mean	0.481481	0.666667
std	0.509175	0.480384
min	0.000000	0.000000
25%	0.000000	0.000000
50%	0.000000	1.000000
75%	1.000000	1.000000
max	1.000000	1.000000

```
In [34]: import scipy.stats
from scipy.stats import pearsonr

# Correlation between Age and Academic Achievement
correlation_age = encoded_df['Age']
correlation_academic_achievement = encoded_df['Academic Achievement']

# Calculate Pearson correlation coefficient and p-value
correlation_coefficient, p_value = scipy.stats.pearsonr(correlation_age, correlation_academic_achievement)

# Print the results
print("Pearson correlation coefficient:", correlation_coefficient)
print("P-value:", p_value)

# Interpretation
alpha = 0.05
print("\nSignificance level (alpha):", alpha)
print("Conclusion:")

sns.regplot(x= correlation_age, y= correlation_academic_achievement, ci=None, line_kws={"color": "red"})

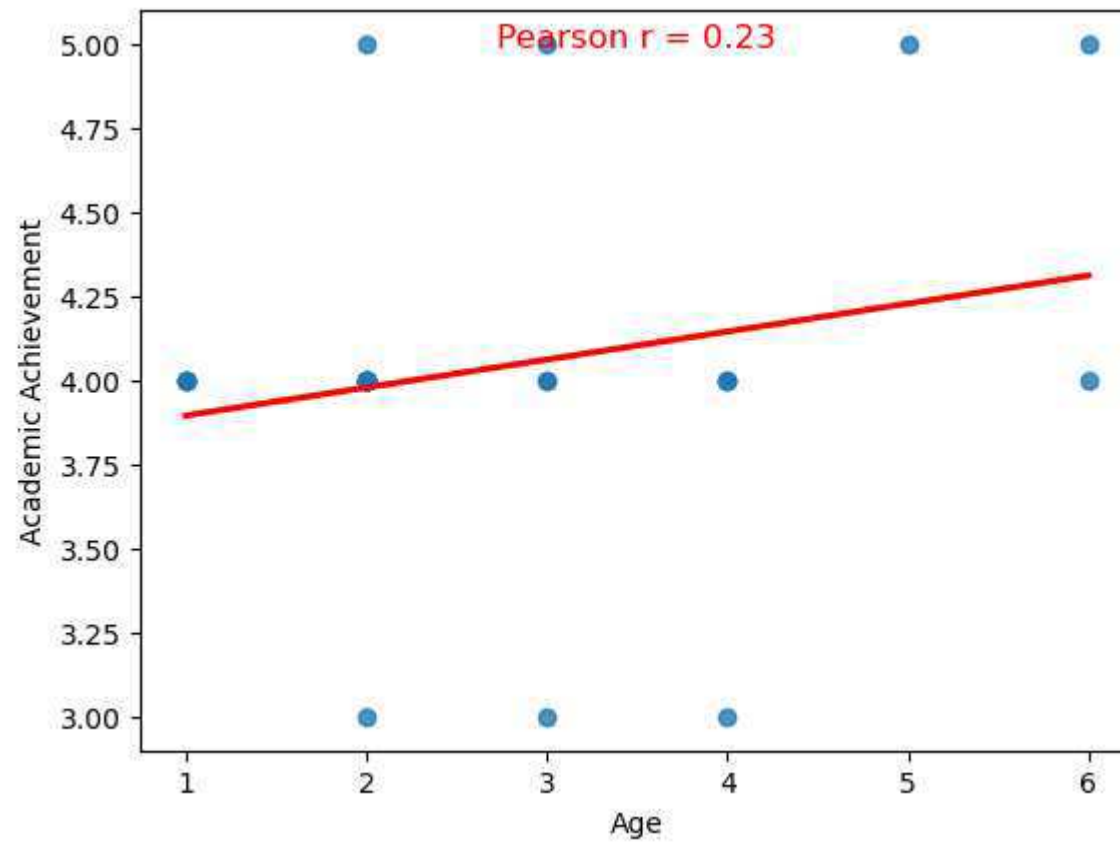
plt.annotate(f'Pearson r = {correlation_coefficient:.2f}',
             xy=(0.5, 0.95), xycoords='axes fraction',
             ha='center', fontsize=12, color='red')
plt.show()
```

Pearson correlation coefficient: 0.22659362003524924

P-value: 0.2557214823236032

Significance level (alpha): 0.05

Conclusion:



```
In [35]: from scipy.stats import chi2_contingency

# Contingency table for the chi-square test
contingency_table = pd.crosstab(encoded_df['Gender'], encoded_df['Academic Achievement'])

# Performing the chi-square test
chi2, p, _, _ = chi2_contingency(contingency_table)

# Displaying the results
print("Chi-square value:", chi2)
print("P-value:", p)

# Interpretation
alpha = 0.05
print("\nSignificance level (alpha):", alpha)
```

Chi-square value: 1.8423529411764703

P-value: 0.39805047083742867

Significance level (alpha): 0.05

```
In [36]: import pandas as pd
from scipy.stats import f_oneway

encoded_cleaned_df = cleaned_df.head(100)

# Mapping for Likert scale labels
likert_mapping = {
    "Strongly Disagree": 1,
    "Disagree": 2,
    "Neutral": 3,
    "Agree": 4,
    "Strongly agree": 5,
    "Strongly agree, Agree": 5,
}

# Apply mapping to Likert scale columns
likert_columns = [col for col in encoded_cleaned_df.columns]
encoded_cleaned_df[likert_columns] = encoded_cleaned_df[likert_columns].applymap(lambda x: likert_mapping.get(x, x))
encoded_cleaned_df
```

Out[36]:

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awaren
0	42 and above	Male	Asian	Yes	Domestic	No	4	4	4	3	4	4	
1	42 and above	Male	European	Yes	Domestic	Yes	5	2	3	5	5	5	
2	32 - 36	Male	European	Yes	Domestic	Yes	4	3	3	4	4	4	
3	22 - 26	Male	Asian	No	International	No	4	4	4	4	4	4	
4	17 - 21	Male	Asian	Yes	International	No	4	5	5	4	4	4	
5	17 - 21	Male	Asian	Yes	International	No	4	4	4	4	4	4	
6	22 - 26	Male	Asian	No	International	No	4	4	4	4	4	4	
7	27 - 31	Male	Asian	No	International	No	4	4	4	4	4	4	
8	22 - 26	Female	Asian	Yes	Domestic	Yes	4	5	5	5	4	4	
9	22 - 26	Female	Asian	Yes	Domestic	Yes	4	5	4	4	5	5	
10	22 - 26	Male	Asian	Yes	International	Yes	4	4	4	4	4	4	
11	22 - 26	Male	Asian	Yes	International	No	3	3	3	3	3	3	
12	32 - 36	Male	Asian	Yes	Domestic	Yes	4	3	4	4	4	4	
13	32 - 36	Female	Pacific peoples, Other ethnicity	Yes	Domestic	No	4	3	4	4	4	4	

	Age	Gender	Ethnicity	Are you enrolled in a scholarship program?	Type of Student	Do you know the NZSE Student Hub Program?	Academic Achievement	Well- being	Community Engagement	Versatility	Mentoring	Learning Environment	Awaren
<b>14</b>	27 - 31	Male	Asian	Yes	Domestic	Yes	5	4	4	4	4	4	
<b>15</b>	32 - 36	Female	Asian	Yes	Domestic	Yes	3	3	4	5	4	5	
<b>16</b>	37 - 41	Female	Asian	Yes	Domestic	Yes	5	5	4	4	4	4	
<b>17</b>	17 - 21	Male	Asian	Yes	International	No	4	4	4	3	3	3	
<b>18</b>	17 - 21	Male	Asian	Yes	Domestic	Yes	4	4	4	4	4	4	
<b>19</b>	22 - 26	Male	Asian	No	International	Yes	4	4	4	4	4	4	
<b>20</b>	22 - 26	Female	Asian	No	International	Yes	4	4	3	4	4	4	
<b>21</b>	22 - 26	Female	Asian	Yes	Domestic	Yes	5	5	4	5	4	4	
<b>22</b>	27 - 31	Female	Asian	Yes	Domestic	Yes	3	4	3	4	4	4	
<b>23</b>	22 - 26	Male	Asian	No	International	Yes	4	4	4	4	4	4	
<b>24</b>	22 - 26	Female	Asian	No	International	Yes	4	3	4	4	4	4	
<b>25</b>	27 - 31	Male	Asian	No	International	Yes	4	3	4	4	4	4	
<b>26</b>	22 - 26	Female	Asian	Yes	Domestic	Yes	4	5	3	4	4	5	

```
In [37]: # Gender Group
gender_group = encoded_cleaned_df.groupby('Gender')
malegroup = gender_group.get_group('Male')['Academic Achievement']
femalegroup = gender_group.get_group('Female')['Academic Achievement']

anova_result = f_oneway(malegroup, femalegroup)
# Displaying the results
print("ANOVA F-statistic:", anova_result.statistic)
print("P-value:", anova_result.pvalue)

# Interpretation
alpha = 0.05
print("\nSignificance level (alpha):", alpha)
```

ANOVA F-statistic: 0.07846829880728187

P-value: 0.7816888094266332

Significance level (alpha): 0.05



```
In [38]: # Type of Student Group
type_of_student_group = encoded_cleaned_df.groupby('Type of Student')
international_group = type_of_student_group.get_group('International')['Academic Achievement']
domestic_group = type_of_student_group.get_group('Domestic')['Academic Achievement']

anova_result = f_oneway(international_group, domestic_group)
# Displaying the results
print("ANOVA F-statistic:", anova_result.statistic)
print("P-value:", anova_result.pvalue)

# Interpretation
alpha = 0.05
print("\nSignificance level (alpha):", alpha)
```

ANOVA F-statistic: 1.226391954868776

P-value: 0.27865160486196044

Significance level (alpha): 0.05

```
In [39]: # Do you know the NZSE Student Hub Program?
doyouknow_group = encoded_cleaned_df.groupby(' Do you know the NZSE Student Hub Program?')
yes_group = doyouknow_group.get_group('Yes')['Academic Achievement']
no_group = doyouknow_group.get_group('No')['Academic Achievement']

anova_result = f_oneway(yes_group, no_group)
# Displaying the results
print("ANOVA F-statistic:", anova_result.statistic)
print("P-value:", anova_result.pvalue)

# Interpretation
alpha = 0.05
print("\nSignificance level (alpha):", alpha)
```

ANOVA F-statistic: 1.111111111111112

P-value: 0.301921999207163

Significance level (alpha): 0.05

```
In [40]: # Are you enrolled in a scholarship program?
areyouenrolled_group = encoded_cleaned_df.groupby('Are you enrolled in a scholarship program?')
yes_group = areyouenrolled_group.get_group('Yes')['Academic Achievement']
no_group = areyouenrolled_group.get_group('No')['Academic Achievement']

anova_result = f_oneway(yes_group, no_group)
# Displaying the results
print("ANOVA F-statistic:", anova_result.statistic)
print("P-value:", anova_result.pvalue)

# Interpretation
alpha = 0.05
print("\nSignificance level (alpha):", alpha)
```

ANOVA F-statistic: 0.05611672278338946

P-value: 0.8146727421463881

Significance level (alpha): 0.05

```
In [41]: # Ethnicity
ethnicity_group = encoded_cleaned_df.groupby('Ethnicity')
asian_group = ethnicity_group.get_group('Asian')['Academic Achievement']
european_group = ethnicity_group.get_group('European')['Academic Achievement']
others_group = ethnicity_group.get_group('Pacific peoples, Other ethnicity')['Academic Achievement']

anova_result = f_oneway(asian_group, european_group, others_group)
# Displaying the results
print("ANOVA F-statistic:", anova_result.statistic)
print("P-value:", anova_result.pvalue)

# Interpretation
alpha = 0.05
print("\nSignificance level (alpha):", alpha)
```

ANOVA F-statistic: 0.8547008547008548

P-value: 0.4379567844606816

Significance level (alpha): 0.05

```
In [42]: from scipy.stats import ttest_ind

def showAnovaResult(group1, group2):
    g1 = encoded_df[group1]
    g2 = encoded_df[group2]

    ttest_result = ttest_ind(
        g1, g2
    )

    # Displaying the results
    print("t-test stat:", ttest_result.statistic)
    print("P-value:", ttest_result.pvalue)

    # Interpretation
    alpha = 0.05
    print("\nSignificance level (alpha):", alpha)
```

```
In [43]: # using t-test for 'Academic Achievement' and 'Well-being'
showAnovaResult('Academic Achievement', 'Well-being')
```

t-test stat: 0.8074884627998473  
P-value: 0.42306351331369296

Significance level (alpha): 0.05

```
In [44]: # using t-test for 'Academic Achievement', 'Community Engagement'
showAnovaResult('Academic Achievement', 'Community Engagement')
```

t-test stat: 1.294317477266984  
P-value: 0.201274422324206

Significance level (alpha): 0.05

```
In [45]: # using t-test for 'Academic Achievement', 'Versatility'
showAnovaResult('Academic Achievement', 'Versatility')
```

t-test stat: 0.0

P-value: 1.0

Significance level (alpha): 0.05

```
In [46]: # using t-test for 'Academic Achievement', 'Mentoring'
showAnovaResult('Academic Achievement', 'Mentoring')
```

t-test stat: 0.2963744891819109

P-value: 0.7681246064655833

Significance level (alpha): 0.05

```
In [47]: # using t-test for 'Academic Achievement', 'Learning Environment'
showAnovaResult('Academic Achievement', 'Learning Environment')
```

t-test stat: -0.2741249873151313

P-value: 0.7850746094134309

Significance level (alpha): 0.05

```
In [48]: # using t-test for 'Academic Achievement', 'Awareness'
showAnovaResult('Academic Achievement', 'Awareness')
```

t-test stat: 2.821790211904493

P-value: 0.0067486114044990565

Significance level (alpha): 0.05

```
In [49]: # using t-test for 'Academic Achievement', 'Financial Support'  
showAnovaResult('Academic Achievement', 'Financial Support')
```

t-test stat: 1.9462193566431985

P-value: 0.05704118523391546

Significance level (alpha): 0.05

```
In [50]: # using t-test for 'Academic Achievement', 'Accessibility'  
showAnovaResult('Academic Achievement', 'Accessibility')
```

t-test stat: 1.6359922335498112

P-value: 0.10788050574404798

Significance level (alpha): 0.05

```
In [51]: # using t-test for 'Academic Achievement', 'Acculturation'  
showAnovaResult('Academic Achievement', 'Acculturation')
```

t-test stat: 1.0871146130092204

P-value: 0.2819996628100451

Significance level (alpha): 0.05

```
In [52]: # using f_oneway to check all Likerts responses
aa = encoded_df['Academic Achievement']
wb = encoded_df['Well-being']
ce = encoded_df['Community Engagement']
v = encoded_df['Versatility']
m = encoded_df['Mentoring']
le = encoded_df['Learning Environment']
aw = encoded_df['Awareness']
fs = encoded_df['Financial Support']
ac = encoded_df['Accessibility']
acu = encoded_df['Acculturation']

anova_result = f_oneway(
    aa,wb,ce,v,m,le,aw,fs,ac,acu
)
# Displaying the results
print("ANOVA F-statistic:", anova_result.statistic)
print("P-value:", anova_result.pvalue)

# Interpretation
alpha = 0.05
print("\nSignificance level (alpha):", alpha)
```

ANOVA F-statistic: 2.0960656529085195

P-value: 0.030252113821610905

Significance level (alpha): 0.05



```
In [53]: # Sample Likert scale data for three groups
aa = encoded_df['Academic Achievement']
wb = encoded_df['Well-being']
ce = encoded_df['Community Engagement']
v = encoded_df['Versatility']
m = encoded_df['Mentoring']
le = encoded_df['Learning Environment']
aw = encoded_df['Awareness']
fs = encoded_df['Financial Support']
ac = encoded_df['Accessibility']
acu = encoded_df['Acculturation']

# Perform one-way ANOVA test
anova_result = f_oneway(
    aa,wb,ce,v,m,le,aw,fs,ac,acu
)

plt.figure(figsize=(20, 6))
# Plot boxplots for each group
plt.boxplot([aa,wb,ce,v,m,le,aw,fs,ac,acu], labels=[
    'Academic Achievement',
    'Well-being',
    'Community Engagement',
    'Versatility',
    'Mentoring',
    'Learning Environment',
    'Awareness',
    'Financial Support',
    'Accessibility',
    'Acculturation'
], widths=0.1)
plt.title('One-way ANOVA Results')
plt.ylabel('Likert Scale Values')
plt.xlabel('Groups')

# Display the p-value on the plot
plt.text(2, np.max([np.max(aa), np.max(wb), np.max(ce), np.max(v), np.max(m), np.max(le), np.max(aw), np.max(fs), np.max(ac), np.max(acu)]),
    f'P-value: {p_value:.4f}', ha='center', va='bottom', color='black', fontweight='bold')

# Show the plot
```



```
plt.show()
```

