KULLIYYAH OF INFORMATION AND COMMUNICATION TECHNOLOGY

DEPARTMENT OF INFORMATION SYSTEMS

CSCI 1304 – Probability and Statistics
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Section: 6

Team Name: Group 1
Lecturer's Name: Dr. Raini Hassan

Group Project Report:
The Effects of Social Anxiety Disorder on Academic Performance: A Statistical Study

Group Members

Member's Name	Matric No.
Sayed Rehana	1920178
Awfa Binti Azlin	2026420
Nurul Izzaty Binti Muhammad Aris	2022876
Nor Anis Fazlin Binti Mohamad Adib	2014954

Rabiatul Adawiyah Binti Mohammad Azmi	2013214

1.0 Abstract:

Social anxiety disorder is a serious issue that many people confront on a daily basis, and it is a major cause of concern among students. This is an issue that should be tackled more often. College and social anxiety aren't a good combination. Students entering college face a plethora of new hurdles, including expectations and activities, as well as more autonomous study than in previous education *(Crede & Niehorster, 2012)*.

The social atmosphere at college sets high demands on students. Making new friends, completing group projects, giving class presentations, and interacting with others daily might be

difficult. This is a concern that most students experience in college, particularly in their first years, and it ought to be addressed.

Research has shown that people with social anxiety do significantly less well than their peers in terms of education, employment, and social relationships *(Stein et al., 1999; Turner et al., 1986)*. Poor performance in specific class activities may have an impact on a student's GPA when it comes to the impact of social anxiety in the college setting. Furthermore, as a result of Covid, students' mental health is deteriorating. According to a national study conducted by the ADAA in 2011, more than 62 percent of students with mental health difficulties who dropped out of college did so because of such concerns.

Despite these findings, relatively little is known about the consequences of social anxiety on students in higher education. To address that, we ran a complementary survey on emotional well-being and learning among students studying at the IIUM.

In conclusion, we believe, rationally and plausibly, that students at IIUM, like other students in general, have battled with social anxiety, which has a negative influence on their overall academic performance, based on our own experiences as IIUM students. As a result, the data gathered will mostly be verifying our premise in this study.

2.0   Introduction:

This research was conducted primarily with the goal of examining the impact of social anxiety on student learning and well-being in the context of higher education. Owing to a lack of engagement in social and educational events, as well as a student's inability to ask questions or seek help from friends or lecturers due to social anxiety can result in poor academic performance and a deterioration in total grades.

We performed an online survey via Google Forms for the context of this research. Our core audience were mainly undergraduates. The survey was completed by 91 students at IIUM in total. The respondents were conveniently sampled.

In the survey, we asked students the most significant questions on social anxiety in the context of college life, and the answers to these questions determined whether or not they suffer from it. Queries regarding their age, gender, and kulliyyah, as well as questions about their degree of anxiety. Finally, the most crucial question was to have them assess how social anxiety affects or has affected their GPA in the past.

The data obtained is a combination of qualitative and quantitative data that is resultant as well as ungrouped. Pie charts were utilized to collect qualitative data, while a histogram was used to collect scale ratings.

The responses were kept basic (on a scale of one to ten) since we wanted the students to wrap up their own experience before we judged and finalized the results based on the other questions.

3.0 Statistical Methods

3.1 Data in use:

The data gathered is a combination of qualitative and quantitative data that is both resultant and ungrouped. Despite the fact that prior research and studies have been completed and are accessible on the issue, our current study focuses on the influence of social anxiety on the IIUM student community. To get fresh statistics, a second definitive survey of IIUM students under diverse kulliyyahs was necessary.

The data was obtained using an online survey that managed to receive 91 respondents. The key independent variable in this study that influences other factors is certainly Social Anxiety Disorder (SAD). Student well-being (mental health) and academic success, on the other hand, are independent variables. There are certain confounding variables that influence the impact of all other variables; they include: The severity of social anxiety (none, mild, moderate, severe, or excessive) as well as the medical therapy that is being prescribed or received. Pie charts were utilized to collect qualitative data, while a histogram was used to collect scale ratings.

First and foremost, indices of central tendency are used in this statistical research primarily to portray data values in a simple and succinct manner so that the mind can grasp the whole general facts quickly. The measure utilized in this study, for example, can be used to evaluate the intensity of social anxiety and its impact on a student's academic performance. For instance, the most commonly picked number (mode) defines the severity of the disorder, whereas the mean shows the most typical data value chosen by students. Similarly, dispersion and position measurements, as well as a few other statistical approaches, are used to determine the dissemination, congregation, and skewness of the data points acquired. These statistical procedures would be useful in establishing the study's key point and statistical outcomes.

5

3.2 Participant Characteristics:

The majority of respondents (51%) were Male and 49% female. Most belonged to the kulliyyah of ICT (32.4%) followed by Laws (31.1%), IRKHS (13.5%) and the remaining others. Over 66.2% of the sample was aged between 21-25 with the remaining 26% aged below 20 and 8% aged amid 26-30. All of the students were undergraduates studying in their initial years.

4.0 Preliminary Analysis

→ Obtained Data:

On a scale of 1-10, rate how social anxiety influences or has influenced your GPA in the past.
74 responses
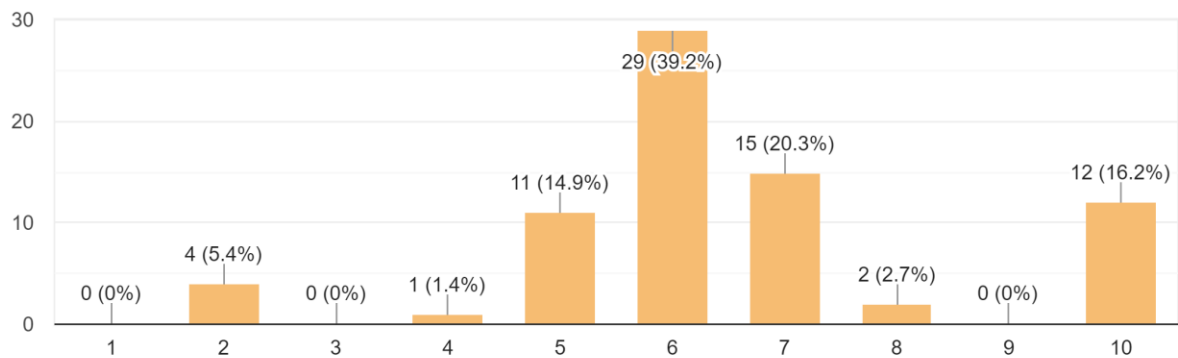
Main acquired data – Google Forms   1

4.1 Dataset

Class Limits (x_i)	Class Boundaries	Frequency (f_i)	$x_i f_i$	Cumulative Frequency
1	0.5 – 1.5	0	0	0
2	1.5 – 2.5	4	8	4
3	2.5 – 3.5	1	3	5
4	3.5 – 4.5	3	12	8
5	4.5 – 5.5	14	70	22
6	5.5 – 6.5	34	204	56
7	6.5 – 7.5	19	133	75
8	7.5 – 8.5	2	16	77
9	8.5 – 9.5	0	0	77
10	9.5 – 10.5	14	140	91
Total		$\sum f_i = 91$	$\sum x_i f_i = 586$	$\sum CF = 415$

Table 1: Ungrouped FD 2

4.2 Mean:

$$Mean(\overline{x}) = \frac{\sum x_i f_i}{\sum f_i} = \frac{586}{91} = \boxed{6.44}$$

4.3 Median:

Method 1: By Formula

- **Arranged Data (Ascending):**

  2, 2, 2, 2, 3, 4, 4, 4, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, <mark>6, 6,</mark> 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 8, 8, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10

  - $n = $ *number of observations*

  - $\textbf{\textit{Median}} = [(\frac{n}{2})^{th} \, obs. + ((\frac{n}{2} + 1))^{th} \, obs.]/2$

  - Here, $n = 91$

  - $\frac{n}{2} = \frac{91}{2} = 45.5$

  - Using the median formula:

$$\therefore Median = (37^{th} obs. + 38^{th} obs.)/2$$

$$= \frac{6 + 6}{2} = \boxed{6}$$

Method 2: Position Locator

$$\frac{n}{2} = \frac{91}{2} = 45.5$$

Class Limits (x_i)	Class Boundaries	Frequency (f_i)	$x_i f_i$	Cumulative Frequency
1	0.5 – 1.5	0	0	0
2	1.5 – 2.5	4	8	4
3	2.5 – 3.5	0	0	4
4	3.5 – 4.5	1	4	5
5	4.5 – 5.5	11	55	16
6	5.5 – 6.5	29	174	45
7	6.5 – 7.5	15	105	60
8	7.5 – 8.5	2	16	62
9	8.5 – 9.5	0	0	62
10	9.5 – 10.5	12	120	74
Total		$\sum f_i = 74$	$\sum x_i f_i = 482$	$\sum CF = 332$

The class

Median by position locator 1

containing the 45th position in the cumulative frequency is after 16 before 60.

Therefore, the Median is 6

4.4 Mode:

The value that corresponds to the highest frequency is 6.

Hence,

$$Mode = 6 - unimodal$$

4.5 Midrange:

$$MR, Midrange = \frac{Lowest + Highest}{2}$$

$$= \frac{1+10}{2} = \frac{11}{2} = 5.5$$

4.6 Variance:

$Formula$:

$$s^2 = \frac{\sum fx^2 - (\sum fx)^2 /n}{n-1}$$

Where,

$$s^2 = Sample\ variance$$

$$x = Class\ value$$

$$f = Frequency$$

$$n = No. of\ observations$$

x	f	fx	$f(x)^2$
1	0	0	0
2	4	8	16
3	1	3	9
4	3	12	48
5	14	70	350
6	34	204	1224
7	19	133	931
8	2	16	32
9	0	0	0
10	14	140	1400
Total	$\sum f = 91$	$\sum fx = 586$	$\sum fx^2 = 4010$

Table 2: Variance Distribution 2

$$s^2 = \frac{4010 - \frac{586^2}{91}}{90} =$$

$$\boxed{s^2 = 3.7}$$

4.7 Standard Deviation:

$$s = \sqrt{s^2}$$

$$s = \sqrt{3.7} = 1.92$$

$$\boxed{s = 1.92}$$

4.8 Chebyshev's Theorem:

We have a left-skewed distribution of data with a mean of 6.4 and a standard deviation of 1.92. The expected proportion of observations to be find within 1.6 standard deviations (symbolized by k) from the mean would be:

$$1 - \frac{1}{k^2}$$

$$= 1 - \frac{1}{(1.92)^2}$$

$$= 1 - \frac{1}{3.68} = 0.728260$$

- Multiplying by 100 to get the percentage:

$$0.728260 \times 100 = \boxed{72.83\%}$$

Hence, the estimated percentage of values in the proposed distribution within 1.92 standard deviations is 72.83% or at least 72.83% of observations fall between -1.92 and 1.92 standard deviations from the mean.

That is:

$$Mean \pm 1.92\ standard\ deviations$$

$$6.4 - 1.92 = 4.5$$
$$6.4 + 1.92 = 8.3$$

Or between 4.5 and 8.3

$$Let\ k = 2$$

$$1 - \frac{1}{2^2}$$

$$= 1 - \frac{1}{2^2}$$

$$= 1 - \frac{1}{16} = 0.9375 = 93.75\%$$

That is:

$$\bar{X} \pm 2s$$

$$6.4 - 2(1.92) = 2.56$$
$$6.4 + 2(1.92) = 10.24$$

As a result, at least 93.75% of data values lie between 2.56 and 10.24 standard deviations from the mean.

Likewise, at least 88.88% of data values fall within 3 standard deviations from the mean or between 0.64 and 11.86:

$$\bar{X} \pm 3s$$

$$6.4 - 3(1.92) = 0.64$$
$$6.4 + 3(1.92) = 11.86$$

4.9 Regression Analysis:

Let us suppose observations (classes) as the independent/predictor variable (x) and the frequencies as dependent/criterion variable (y):

x	y
1	0
2	4
3	1
4	3
5	14
6	34
7	19
8	2

9	0
10	14

Table 3: Regression Analysis 2

For the sake of evaluation, we have the following table:

x	y	xy	x^2	y^2
1	0	0	1	0
2	4	8	4	16
3	1	3	9	1
4	3	12	16	9
5	14	70	25	196
6	34	204	36	1156
7	19	133	49	361
8	2	16	64	4
9	0	0	81	0
10	14	140	100	196
$\sum x = 55$	$\sum y = 91$	$\sum xy = 586$	$\sum x^2 = 385$	$\sum y^2 = 1939$

Table 4: Regression Analysis 2 2

- Evaluating a and b:
-

$$a = \frac{(\sum y)(\sum x^2) - (\sum x)(\sum xy)}{n(\sum x^2) - (\sum x)^2}$$

$$= \frac{(91)(385) - (55)(586)}{10(385) - (55)^2}$$

$$= \frac{17}{5} = 3.4$$

$$b = \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2}$$

$$= \frac{10(586) - (55)(91)}{10(385) - (55)^2}$$

$$= 1\frac{2}{55} = \mathbf{1.03}$$

Thus,

$a = 3.4$

$b = 1.03$

- Inserting the values within the equation:

$\grave{y} = a + bx$

$\boxed{\grave{y} = 3.4 + 1.03x}$

The above acquired regression equation can be used to predict future data outcomes. In other words, it can be a prediction function.

4.10 Pearson's Coefficient of Skewness:

Formula #1:

$$S_{k_{p_1}} = \frac{\bar{M} - M_o}{\partial}$$

Where,

$S_k = Skewness$ $\bar{M} = Mean$ $M_o = Mode$ $\partial = Standard\ Deviation$

$$S_{k_{p_1}} = \frac{\bar{M} - M_o}{\partial} = \frac{6.4-6}{1.92} = \frac{0.4}{1.92} = \boxed{0.2}$$

Skewness > 0

Therefore, we have a slight positively-skewed curve.

Formula #2:

$$S_{k_{p_2}} = \frac{\overline{3(\bar{M} - M_d)}}{\partial}$$

Where, $M_d = median$

$$S_{k_{p_2}} = \frac{3(6.4-6)}{1.92} = \boxed{0.6}$$

Again, the obtained value indicates the positive-skewness of the data curve.

4.11 Box-Plot:

Five number Summary:

Minimum: 2

First Quartile (Q1): 6

Median: 6

First Quartile (Q3): 7

Maximum: 10

Median

6   7

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•                    ┌──────────┐                    •
1   2                Q1         Q3                   10
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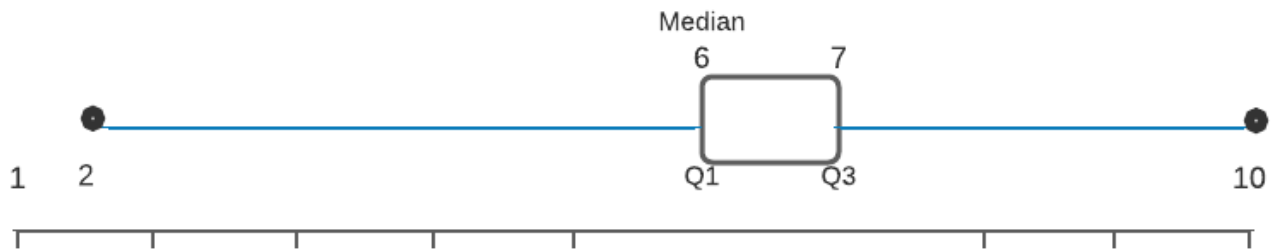

Box and whisker plot 1

As can be observed, the median lies to the left of the box's center, indicating that the distribution is positively skewed once again.

5.0 Final Analysis and Results:

Based on the proposed research, we may draw a number of conclusions mirroring the obtained responses of the survey data before arriving at the primary conclusion and outcomes. The acquired results considering the data and overall analysis can be summarized as follows:

- The majority of respondents **(51%)** were Male and **49%** female.
- Most belonged to the kulliyyah of **ICT (32.4%)** followed by **Laws (31.1%)**, **IRKHS (13.5%)** and the remaining others.
- Over **66.2%** of the sample was aged between **21-25** with the remaining **26%** aged **below 20** and **8%** aged amid **26-30**.
- All of the students were **undergraduates** studying in their initial years.

We know that Social Anxiety Disorder impairs a large number of students in higher education, not only in terms of wellness but also in terms of academic performance. However, this study was to determine the intensity of this influence, not only the influence itself.

According to the scale used by the respondents to rate the influence of social anxiety on their Grade Point Average (GPA), it can be concluded that:

Based on the Pearson's coefficient of skewness as well as the box and whisker plot approaches, the data distribution exhibits a slight positively skewed curve.

The average or most common value of the distribution, calculated using the arithmetic mean, is 6.4, indicating that most students believe social anxiety has a significantly larger impact on their academic performance than the overall middle value of 5, implying that it affects students slightly more than the norm.

The most often chosen number, with a frequency of 34 on the scale, was again 6, indicating the mode, implying that students are more deeply affected by social anxiety's detrimental influence on their academic performance than the usual.

Considering the measures of dispersion, the calculated variance value of 3.7 suggests that the data is less dispersed and that the data points tend to be relatively near to the mean and to each other. Similarly, the 1.92 standard deviation demonstrates that the majority of the data is clustered around the mean. according to Chebyshev's theorem, at least 72.83% of observations lie between -1.92 and 1.92 standard deviations from the mean. Similarly, 93.75% of data values are between 2.56 and 10.24 standard deviations from the mean, and 88.88% of data values are between 0.64 and 11.86 standard deviations from the mean.

Finally, using regression analysis, an equation was formed that may be utilized to forecast future data outcomes by entering values into it. To put it another way, it has the potential to be a prediction function.

To summarize and get to the key matter of this analysis, we can say that the majority of students at IIUM, primarily undergraduates in their first years, consider social anxiety to be a major factor in poor academic performance or lower GPA marks, not only in our own kulliyyah (BIT) but in a variety of other programs.

6.0 Conclusion and Recommendations:

To begin, we'd like to remark that the respondents in our study were asked to rank their academic performance in correlation with social anxiety on a scale. This was due to the fact that, when other components of the circumstance are evaluated, there are many factors that might affect a student's academic performance, and social anxiety is not the only one. As a result, we are unable to incorporate all of them in order to make conclusions because this study is solely focused on social anxiety.

As previously indicated, our main study demonstrates that IIUM students, as representations of the wider student population, have experienced and are experiencing a significant degree of social anxiety, particularly during their undergraduate years. This is understandable since, following the relaxed and stress-free atmosphere of school, students are suddenly exposed, or should we say, required, to make new acquaintances, complete group projects, give class presentations, and interact with people on a regular basis.

Most of us have dealt with social anxiety at some point in our lives, not just in college but in all aspects of our social lives. I'll provide a few instances to demonstrate how bad it may be: When you receive a phone call, you become anxious, when someone knocks on the door, you become agitated, you become nervous when the teacher asks a question in class, when the cashier asks for your card or money, you start to sweat, when the server asks for your order, you become nervous, your lips tremble when you speak to people who aren't relatives or close pals, it gives you the shivers to go to the doctor.

Social anxiety is a nightmare, which is why this research was carried out in order to draw attention to this important issue, which, sadly, does not receive the attention it deserves. You may believe that people with social anxiety should be left alone and not stressed out, but this is not the case. Instead, they should be encouraged to practice more, compile more social interactions, compile and present only the topics that they are passionate about, and meditate/exercise regularly. These are just a few of our recommendations to cope with social anxiety in the context of higher education.

This is merely a brief study among IIUM students to raise awareness of this issue. We'd want to see students conduct additional research on this issue with a larger audience, considering more particular characteristics, and more specific viewpoints as well as outcomes.
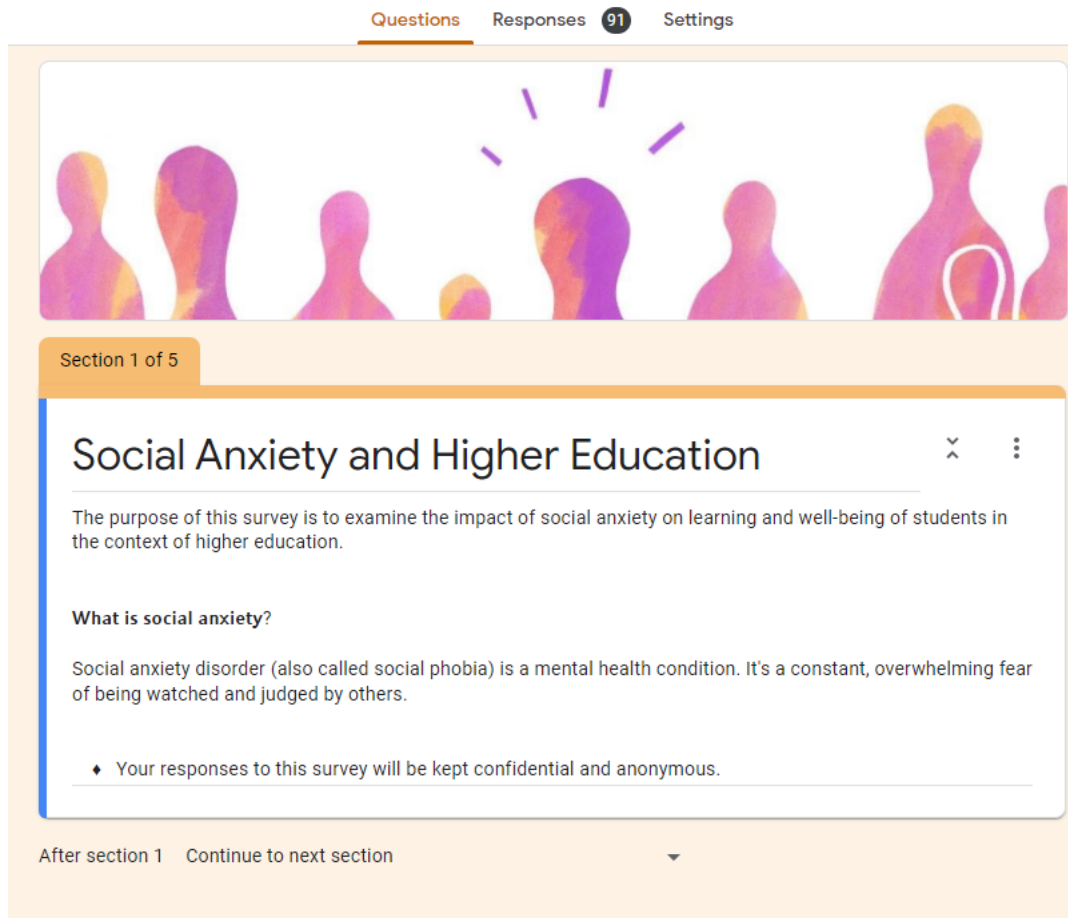
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7.0 References

1. Mistler, B. J., Director, Reetz, D. R., Krylowicz, B., & Barr, V. (2013). *The AUCCCD Annual Survey and Report Overview*. Retrieved from http://files.cmcglobal.com/Monograph_2012_AUCCCD_Public.pdf

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3. Arjanggi, R., & Kusumaningsih, L. P. S. (2016). The Correlation between Social Anxiety and Academic Adjustment among Freshmen. *Procedia - Social and Behavioral Sciences*, *219*, 104–107. Retrieved from https://www.sciencedirect.com/science/article/pii/S1877042816300519

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8.0 Appendix

Online Survey questionnaires:

Online survey questionnaires 1

Do you feel hesitant to participate in a conversation or dispute with strangers?

91 responses

- Yes
- No
- Maybe

22% No
23.1% Maybe
54.9% Yes
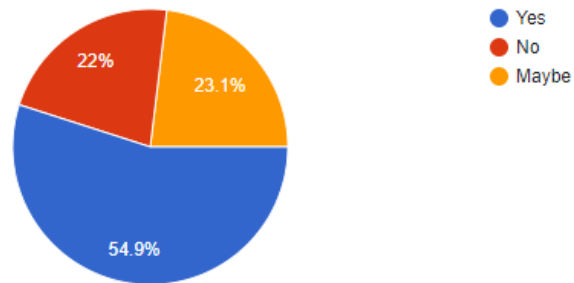
Do you have trouble forming new friendships or relationships?

91 responses

- Yes
- No
- Maybe

25.3% No
24.2% Maybe
50.5% Yes
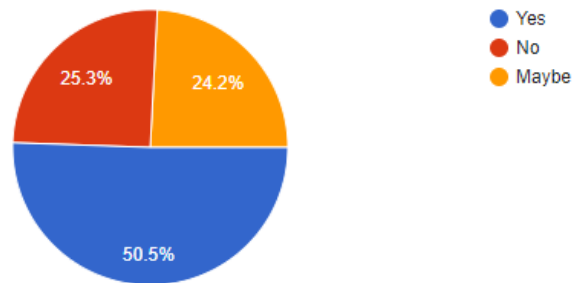
Do you lack confidence in your general ability to do things?

91 responses

- Yes
- No
- Maybe

19.8% No
28.6% Maybe
51.6% Yes
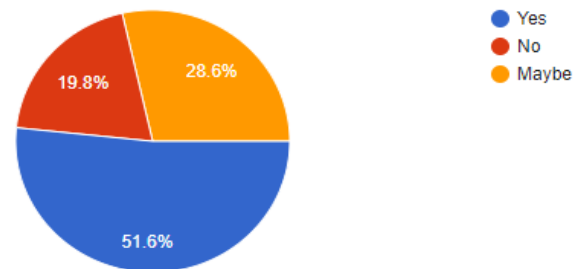
Do you resist raising your hand during a class time even if you know the answer to a question?

91 responses

- Yes
- No
- Maybe

25.3% No
19.8% Maybe
54.9% Yes

22
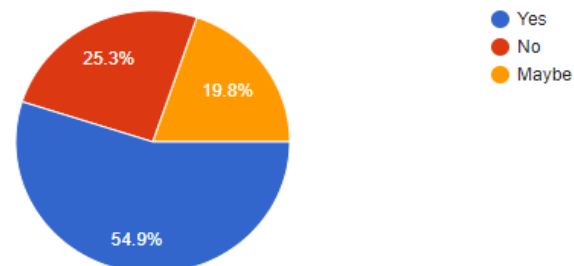
Part B

Missing out on learning opportunities by avoiding interaction physically or psychologically

91 responses

- Frequently
- Occasionally
- Never

42.9%
15.4%
41.8%
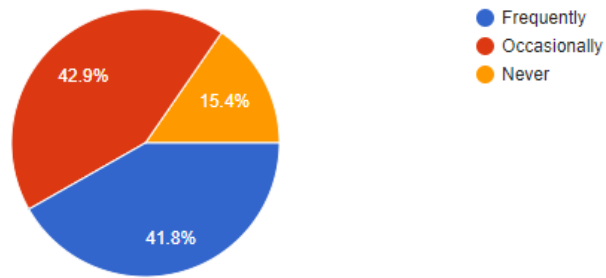
Avoiding asking teachers or friends for help

91 responses
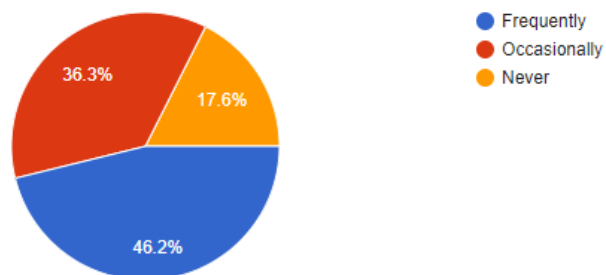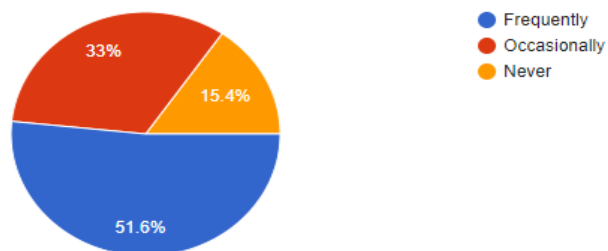
- Frequently
- Occasionally
- Never

36.3%
17.6%
46.2%

Not studying due to feeling emotionally distressed

91 responses

- Frequently
- Occasionally
- Never

33%
15.4%
51.6%

Intense rehearsal and preparation for presentations or seminars

91 responses

- Frequently
- Occasionally
- Never

40.7%
8.8%
50.5%

23

Online survey questionnaires 2 1

Not studying due to feeling emotionally distressed

91 responses

Frequently — 51.6%
Occasionally — 33%
Never — 15.4%

Intense rehearsal and preparation for presentations or seminars

91 responses

Frequently — 50.5%
Occasionally — 40.7%
Never — 8.8%
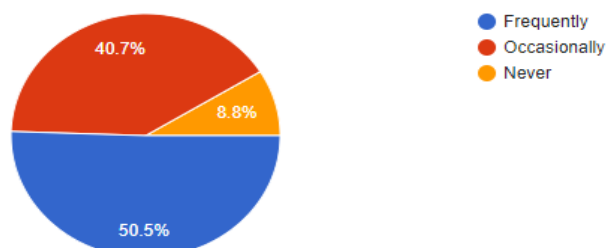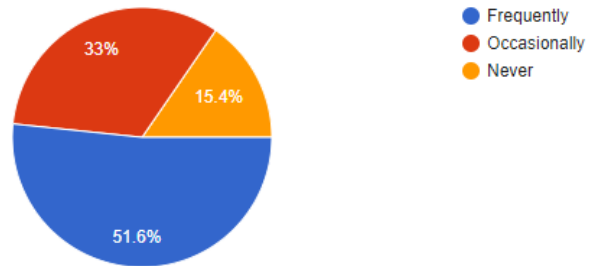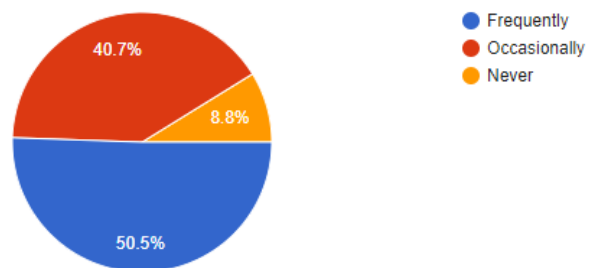
Being easily hurt by what other people say

91 responses

Frequently — 42.9%
Occasionally — 40.7%
Never — 16.5%
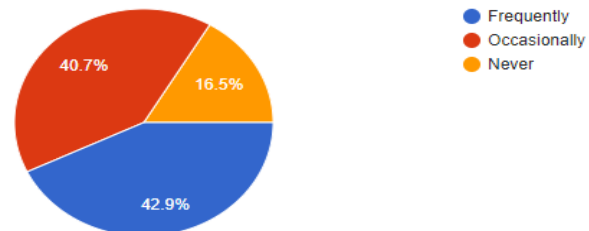
Feeling lonely

91 responses

Frequently — 52.7%
Occasionally — 34.1%
Never — 13.2%

24
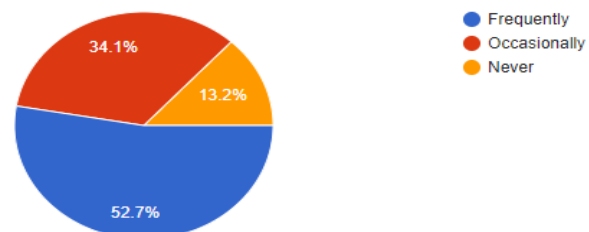
Part C

In which of the following age groups do you belong?

91 responses

- 18-20
- 21-25
- 26-30
- 31 and above

56%
37.4%
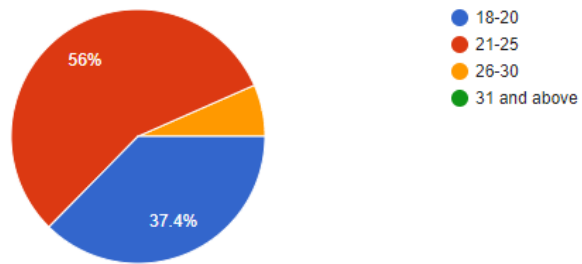
What gender do you identify as?

91 responses

- Male
- Female
- Other

53.8%
46.2%
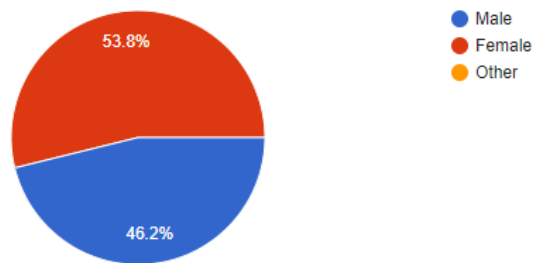
Select your kulliyyah/program

91 responses

- ALLIED HEALTH SCIENCES
- ARCHITECHTURE
- BRIDGING PROGRAMME
- CELPAD
- COCU
- DENTISTRY
- EDUCATION
- ENGIN

▲ 1/3 ▼

27.5%
11%
27.5%
9.9%
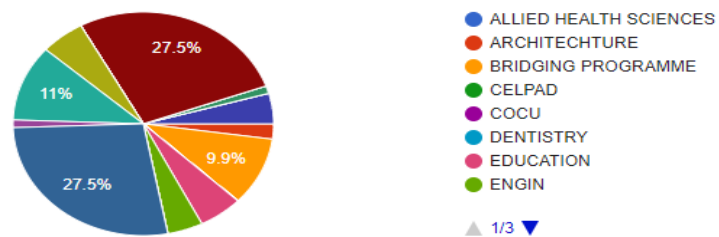
Education Type:

91 responses

- Undergraduate
- Postgraduate

95.6%

Online survey questionnaires 3

25
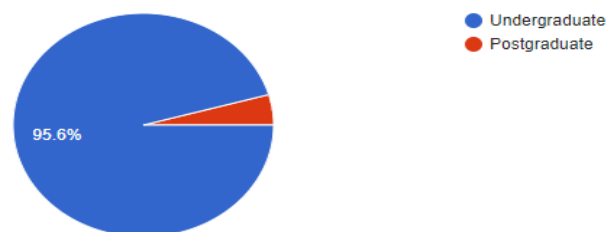
On a scale of 1-10, rate how social anxiety influences or has influenced your GPA in the past.

91 responses
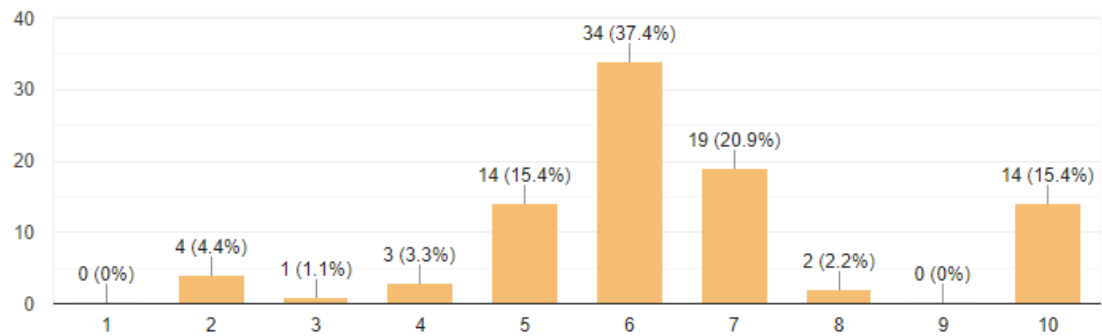
Online survey questionnaires 4

Bad Sample Answer

Part A

You may have social anxiety (social phobia) contingent upon these questions.

Do you feel hesitant to participate in a conversation or dispute with strangers? *

○ Yes
○ No
◉ Maybe

Peculiar, confusing

Do you have trouble forming new friendships or relationships? *

○ Yes
○ No
◉ Maybe

Figure 7: Bad sample answer 1

Good Sample Answer

Figure 8: Good sample answer 1

The complete survey summary can be seen here:

https://1drv.ms/b/s!AhY3Eeyg9MHKgbc6gWkOOeVc0_4hig?e=sUGtzJ