MIDDLE EAST TECHNICAL UNIVERSITY

Navigating Student Journeys: Exploring the Impact of College Clubs

STAT365 Sampling and Survey Techniques

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ABSTRACT

The main goal of our project is to investigate the impact of clubs within METU (Middle East Technical University) on the member students. We conducted a survey with 255 students to analyze whether being active members in clubs has positive or negative effects on their social, academic, and future professional lives. The individuals considered in our research are students who are actively involved in clubs and have previously taken on active roles. Additionally, we asked the students if they had any thoughts about the influence of clubs on their social and academic lives, aiming to gather insights through the survey. All the data we obtained because of the survey is categorical data. Chi-Square test is used to indicate the significance of the relationship between two categorical variables. This test uses a frequency view of the observed data set that would be expected if there is a true association between two variables or, in the case of random outcomes. That's why we did most of our analysis using the Chi-square test.

1. Introduction

University communities not only come together to increase students' social interaction and for entertainment but also play a crucial role in their personal and professional development. This study aims to analyze in detail the positive and negative effects of community participation on students, highlighting the opportunities and obstacles offered by university communities. The survey questionnaire formulated for students at METU who are also community members. The project survey completed by 255 METU community members who are students during the spring semester of 2023-2024. The survey includes questions about how communities affect students' social lives, whether students gain experience, and their willingness to take on leadership roles within the club. Additionally, students participating in university communities asked to evaluate how these experiences impact them and how these effects will shape their future career and life paths. The analyses provide information on the types of

communities' students prefer to be part of the impact of the community on academic achievements, whether it contributes to personal development, and if the gained experiences are applicable in their professional lives.

1.1 Data Description

The survey gathered data from 255 participants, whom are students who were members of any college clubs at METU, and in the survey, there were16 questions. The data collected comprises responses to a set of structured questions that include question types which are multiple-choice, Likert scale (as a multiple-choice question type), and binary options. Also, the survey includes a diverse range of question types, notably demographic questions, and multiple-choice questions. The dataset is designed to offer a comprehensive reflection of participants' experiences and insights by incorporating both demographic and subjective question types. The dataset, available in CSV format, is structured to facilitate analyses that explore the diverse dimensions of student engagement with college clubs. The individual answers were kept completely private and exclusively for scholarly purposes; they were not disclosed to any parties.

1.2 Research Questions

1) Is GPA a factor for community members to include community involvement on their CV?
2) Does students' improving time management by participating to the community affect their academic success?
3) Does participation in university clubs positively impact students' communication and leadership skills, academic performance, and ability to balance social life and club commitments?
4) How does involvement in extracurricular clubs influence students' time management skills and academic performance?

5) Are successful students planning to include your college club activities on your resume or resume in the future?

1.3 Aim of the study

The aim of the project is to comprehensively examine the effects of community participation on the personal and academic development of METU students. The project aims to collect data on participants' academic standing, club memberships and duration of participation, while also exploring their motivations for joining a club and assessing perceived impacts on personal development, communication skills, time management, academic performance, and social life. Additionally, the project aims to investigate students' attitudes towards higher leadership positions in their clubs and whether they believe their club experiences will be valuable for their future careers or academic pursuits. The main goal of the project is to provide valuable information on the importance of extracurricular activities in the overall development of university students, focusing on METU's club environment.

2. Literature Review

Participation in university communities is not merely about having fun and socializing; it provides an environment where members can expand their networks and develop themselves in various ways. Chatham (2015) conducted a study aligning with my viewpoint, concluding that slightly less than half of the survey participants revealed that their primary motivation for engagement was professional development or resume enhancement. Interestingly, a minority of respondents highlighted the importance of meeting new people, although it is worth noting that some may have perceived this motivation as synonymous with socializing. These communities offer unique opportunities for students to enhance their collaboration and communication skills, reinforcing their leadership abilities through community projects and

activities. These experiences not only enrich students' practical skills but also provide them with a platform to build real-world connections and create professional networks, making university communities a crucial preparation platform for their careers (The College of St. Scholastica, 2017).

At METU (Middle East Technical University), there are over 100 clubs catering to different interests and passions. These clubs offer a wide range of options, from cultural and artistic groups to sports and academic communities. The diversity within these communities allows students to continue developing themselves by participating in groups aligned with their interests. Balancing participation in clubs, maintaining a social life, and dedicating time to academic pursuits, students continually refine their time management skills. This practice not only instills a strong sense of discipline but also develops the ability to effectively prioritize tasks and contribute meaningfully to the chosen community.

Beyond focusing only on academic success, students can also prioritize their personal and social development. Balanced use of time provides students with a unique competitive advantage both in their university life and in their future career journeys. We can also say that it defends this idea when we look at student participation theory (Astin, 1984), which suggests that there is a direct relationship between students' capacity to achieve certain developmental goals and the investment of time and energy in activities designed to improve these results. This theoretical framework underlines the importance of active participation in extracurricular activities and emphasizes that the depth and breadth of participation plays an important role in shaping students' overall development.

Participation in communities also plays a critical role in enhancing social communication skills. University communities provide students with the chance to interact and collaborate with individuals from diverse backgrounds,

fostering a variety of perspectives and strengthening empathy skills. Additionally, communities offer practical opportunities for students to engage in interaction and communication. Tasks, projects, and activities within these communities enable individuals to develop leadership, teamwork, and effective communication skills. These experiences help students expand their social networks and understand different perspectives.

In conclusion, community participation not only strengthens social communication skills but also equips students with the ability to communicate effectively in a broader societal context.

3. Results and Findings

3.1 Exploratory Data Analysis

We have classified the communities in METU according to their types as career, sports, liberal, fine arts, and Ngo.

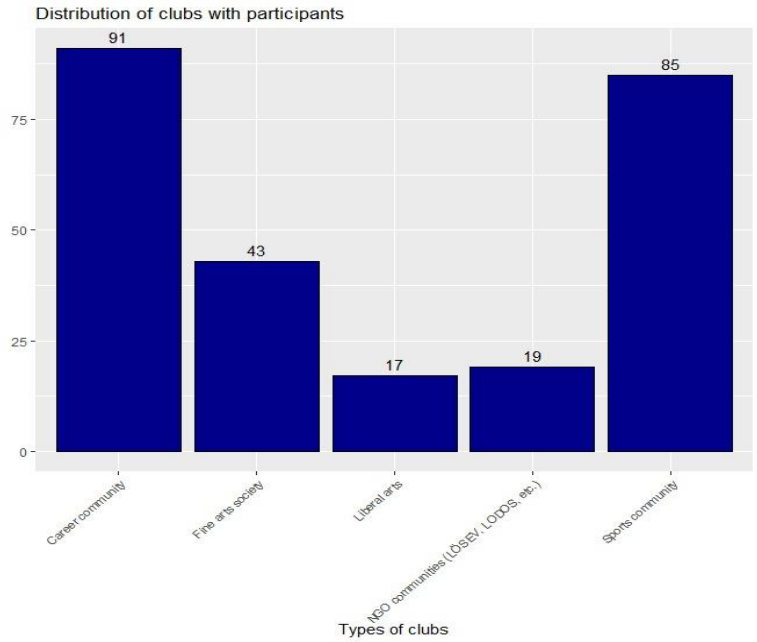

Figure 1 – Bar plot of communities

Out Of the 255 people who participated in the survey, 115 (45.1%) were engineering, 84 (34.5%) were science and literature, 22 (8.6%) were education,

22 (8.6%) were economics, and 8 (3.1%) are studying at the faculty of architecture.

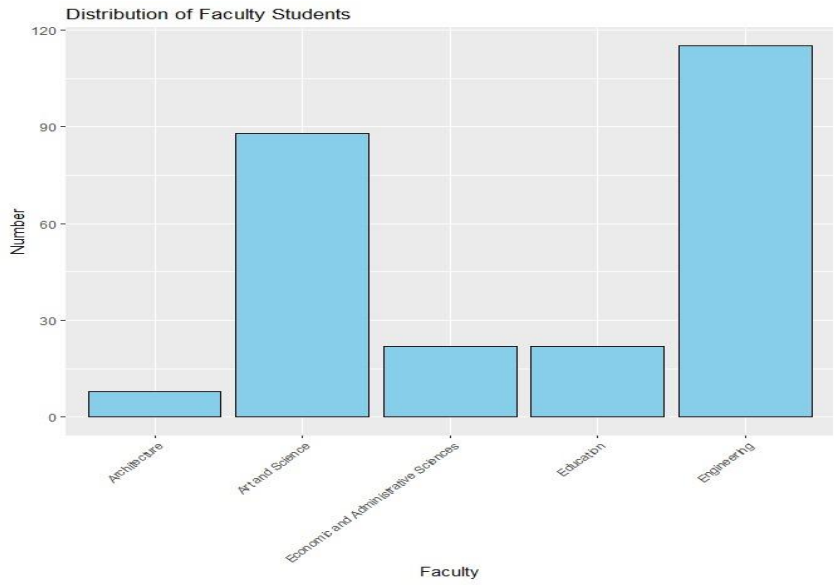

Figure 2- Bar plot of faculties

As seen in the *figure 2*, more than 50% of our survey consists of engineering and science and literature students.

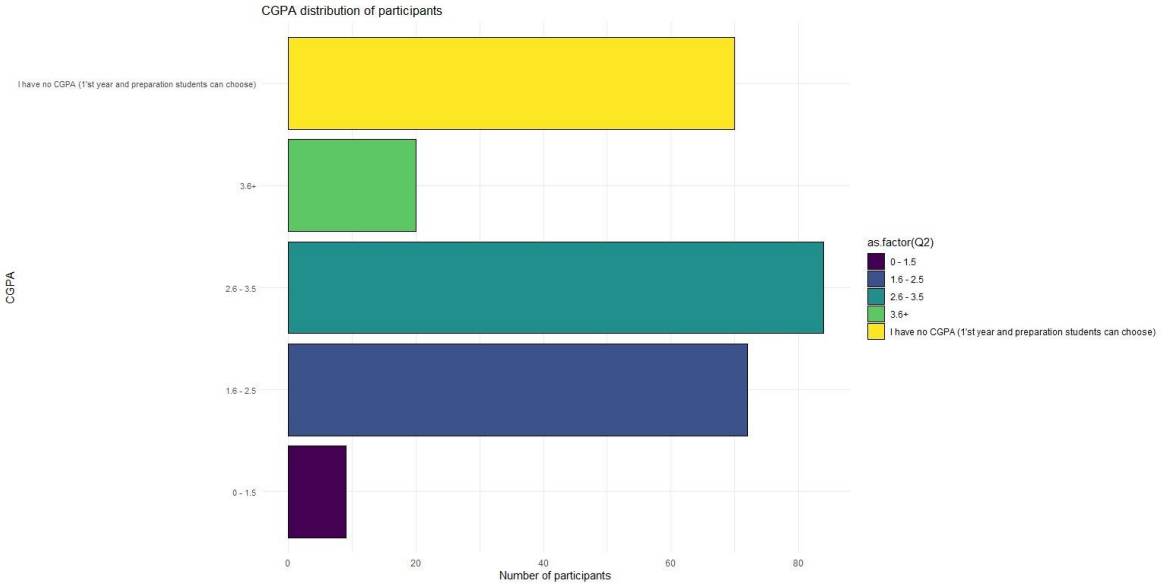

Figure 3 – Bar plot of CGPA

The figure 3 shows students' CGPA when they are active member of clubs. When we examine the plot, we see 84 people whose general average level is between

2.6 and 3.5 and 72 people whose general average level is between 1.6 and 2.5. Based on these data, it can be said that the general level of the participants is above the intermediate level.

Duration	Prepation Student	1st year	2nd year	3rd year	4th yea
0-4 Months	20	29	18	15	25
5-9 Months	2	7	5	6	6
9-12 Months	0	5	5	3	5
1+ year	0	24	34	42	26
Total	22	65	62	66	62

Table 1 – Duration and grades table

When we look at the table 1, we can see that the membership period of the upper classes is longer. We can interpret the 1st and 4th grades as the classes with the most community participation.

Departmant	Career	Fine arts	Liberal ar	NGO	Sport
Architecture	2	2	2	0	2
Art and Science	28	21	7	6	26
Economic and Administrative Sciences	11	2	4	2	3
Education	8	4	1	5	4
Engineering	42	14	3	6	50

Table 2- Frequency of preference of communities by departments

You can see in Table 2 which types of clubs students from different departments participate in. If we check the club selection of the departments, we can conclude that the selection of most departments was based on career and sports communities.

3.2 Confirmatory Data Analysis

One purpose of our project was to observe whether community participation would affect students' future career lives. "Do you plan to include your college club activities in your CV or resume in the future?" in our survey. We created the

mean table of the students who answered YES and NO to the question. When you look at the figure, you can see that most people say YES.

Q16	N	Mean	SD	95% CI
YES	210	0.8236	0.382	0.7764 ; 0.8706
NO	45	0.1764	0.38	0.1294 ; 0.2236

Figure 4 – Means

The high rate of YES, we received, we applied the Chi Square test to see whether the CGPA were a factor in the choices of people with low CGPA. We looked at Odds Ratio: Approximately 1.0. This means that people with a CGPA of less than 3 are willing to add their experience to their CV, neither with nor without the knowledge. In other words, there is no significant impact on separating the CGPA's CV section system for this group.

We applied the Chi-square test to observe the relationship between the duration of membership in the community and the success of the students. If we were to interpret the Chi-square table (in Appendix B) we obtained because of our test:

Chi-Square Value = 49.2654, Chi-Square value indicates whether there is a connection between two variables. The higher this value, the greater the difference between observed and expected frequencies. A high Chi-Square value suggests a significant relationship between two variables. P-Value =1.879564180858221e-0 The P value evaluates whether the observed data is due to a randomly occurring situation. This very small p value (e-06) indicates a statistically significant relationship between the two variables. The P value is usually compared to the established significance level (alpha) (for example, alpha = 0.05). In this case, since the p value is very small, the null hypothesis is rejected, and it is accepted that there is a significant relationship between the two variables.

Spearman correlation matrix is generally used to examine the relationship between two variables and to evaluate whether this relationship is monotonic.

Spearman correlation is a measure that expresses the relationship between variables, but unlike Pearson correlation, it is only capable of capturing non-linear (monotonic) relationships. With this method we chose for our Likert Scale type questions in our survey, Q7"Does club involvement play role in enhancing your communication and leadership skills?", Q10"Does club involvement influenced your academic performance?", and Q11"How would you rate university clubs as impacting your ability to "Balance your social life and club participation?" We analyzed whether there was a relationship between the questions. As a result of our analysis:

Spearman Correlation Matrix (figure in Appendix B):

(Q7-Q10): -0.22 is a negative value. This indicates a weak negative correlation between Q7 and Q10.

(Q7-Q11): -0.07 is a negative value. This indicates a very weak negative correlation between Q7 and Q11.

(Q10-Q7): -0.22 is a negative value. This indicates a weak negative correlation between Q10 and Q7.

(Q10-Q11): -0.34 is a negative value. This indicates a moderate negative correlation between Q10 and Q11.

(Q11-Q7): -0.07 is a negative value. This indicates a very weak negative correlation between Q11 and Q7.

(Q11-Q10): -0.34 is a negative value. This indicates a moderate negative correlation between Q11 and Q10.

As a result, highlighted that good time management of METU students does not directly lead to academic success. At the same time, we concluded that it does not have any effect on the development of communication skills, which we highlight as personal development.

In the 9th question of our survey, we factorized the NO, MAYBE and YES questions according to the Likert scale and applied the Kruskall Wallis test to observe whether there was a difference between them and the 10th question.

A significant median difference between groups refers to a situation determined by a statistical test result. Non-parametric tests, such as the Kruskal-Wallis test, check whether the median, a measure of central tendency, is equal between groups. If the p value as a result of the Kruskal-Wallis test is less than a certain level of significance (usually 0.05), then it is said that there is a statistically significant difference in median values between the groups.

In our analysis, since the p-value is less than 0.05, you concluded that there is a significant difference in median values between the groups. This means that the differences observed in our data for 'Q9' and 'Q10' are unlikely to have occurred by chance, and there is a statistically significant difference in their median values.

3.3 Modeling

We included the CGPA data we collected in our survey in the successful category of people with a score above 2.5. To test whether successful students will add the experiences they gained in the community to their CVs in their professional lives in the future, we established a logistic regression model to examine whether there is a relationship between them and the data we obtained in the sixteenth question of our survey.

While establishing the logistic regression model, we performed the analysis after converting the yes and no answers into binary 1-0. We examined the p value of our model output to observe whether there was a significant relationship between them as a result of our model. Since the p values examined were greater than the test value of 0.05, no significant relationship was found for each factor. We did not observe a significant relationship because of the analysis. After our analysis and factoring for each CGPA range, we concluded that whether or not the achievements gained in the community are added to the CV or not is not a significant connection with academic success.

Odds ratio: Approximately 1.0. This indicates that students with a CGPA less than 3 are neither inclined nor disinclined to include community experiences on their CVs. In other words, for this group, CGPA does not appear to have a significant impact on adding community experience to the CV.

4. Conclusion

The analyzes and modeling we made using the data we received from our face-to-face survey are Chi-square test, Logistic Regression, Kruskal-Wallis's test, and Spearman Correlation matrix test. Our purpose in conducting the analysis was to observe the positive results of METU communities on active members in many aspects, as the main purpose of our project.

As a result of our analysis, we thought that those with low averages would add community activities to their CVs to make themselves stand out, while students with high averages would prepare a CV that highlights their academic achievements. However, because of the analysis, we observed that students with low averages did not include community interactions in their CVs and exhibited a neutral attitude. Moreover, unlike these students, we observed that students with high averages preferred to include community interactions in their CVs.

This showed us that communities have a positive impact on students regarding their future. We analyzed that their social, academic, and personal development have no connection with each other, but have a significant and significant impact on themselves. While conducting our analysis, we considered whether being in the community for a long time had a negative impact on students' academic success, and after our tests and analysis, we observed that students with long-term membership had higher averages and were successful in time management.

In the frequency table we prepared about which communities' faculty-based students tend to join, we saw that the majority of science, literature and engineering students who participated in our survey preferred career and sports

communities. We associated this situation with what successful students add to their CVs.

References

Astin, A. W. (1984). *Student involvement: A developmental theory for higher education*. https://www.middlesex.mass.edu/ace/downloads/astininv.pdf

Chatham, M. (2015). *Prepared by Matt Chatham Research Analyst Center for Student Involvement* (p. 73). https://www.eou.edu/governance/files/2015/05/Report-Student-Involvement-Survey-2015.pdf

The College of St. Scholastica. (2017, July 10). *The importance of community participation: Why college clubs & organizations matter*. The College of St. Scholastica. https://www.css.edu/about/blog/the-importance-of-community-participation-why-college-clubs-organizations-matter/#:~:text=It%20helps%20you%20become%20more%20collaborative&text=Participation%20in%20them%20encourages%20teamwork

Appendix A: Survey Questionnaires

The following are the survey questions utilized in this study:

1) *What motivated you to join the club?
    a) Interest in the club's activities and mission
    b) Desire to meet new people and make friends
    c) Recommendation from friends or peers
    d) Opportunities for personal and professional development
    e) Previous positive experiences with similar clubs or organizations
    f) Seeking a creative outlet or hobby

2) In your opinion, does club involvement play role in enhancing your communication and leadership skills?
    a_ 1 Strongly Dİsagree
    b_ 2 Disagree
    c_ 3 Neutral
    d_ 4 Agree
    e_ 5 Strongly agree

3) Do you feel that being part of a college club has positively impacted your personal growth and self-confidence?

A_ YES B_MAYBE C_NO

4) Do you think your involvement in the club has positively affected your time management skills?

A_YES B_MAYBE C_NO

5) * In your opinion, does club involvement influenced your academic performance?
    a_ Strongly Dİsagree
    b_ Disagree
    c_ Neutral
    d_ Agree
    e_ Strongly agree

6) How would you rate university clubs as impacting your ability to balance your social life and club participation?
    a_ 1 (effect negatively)
    b_ 2
    c_ 3 (not effect)
    d_ 4
    e_ 5 (effect positively)

7) * Would you consider taking on a higher leadership position within the college club in the future?

A_YES C_NO

If yes answer the question below.

8) How important are the following reasons for your willingness to consider a higher leadership position within the club?

a) Professional development opportunities
b) Personal growth and challenge
c) Desire to make a positive impact on the club and its members
d) Influence on club decisions and direction
e) Opportunities to develop leadership skills
f) Networking opportunities

If no answer the question below.

13)How important are the following reasons for your lack of interest in considering a higher leadership position within the club?

a) Lack of time due to academic commitments
b) Limited interest in leadership roles
c) Concerns about the additional workload and stress
d) Satisfied with current level of involvement in the club
e) Lack of confidence in leadership abilities
f) Desire to focus on personal activities outside of the club
g) I haven't been involved in the college club long enough to assess networking impact

14)How has your involvement in the college club influenced your ability to work in a team or collaborate effectively?

a) Improved significantly
b) Improved moderately
c) Improved slightly
d) No significant impact
e) Not sure/Not noticed
f) N/A (I haven't been involved long enough)

15)*Do you believe that the leadership or membership experience gained within the college club will be valuable in your future career or academic pursuits?

A_ YES B_NO

16)*Do you plan to include your college club activities in your CV or resume in the future?

A_ YES B_NO

Appendix B: Analysis Tables

For research question 2:

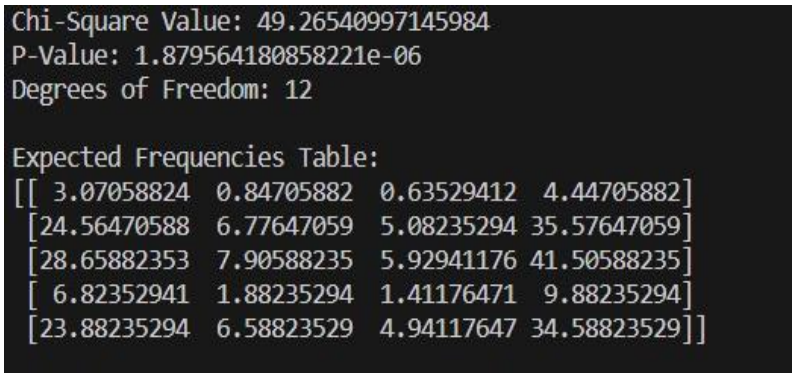

Figure 5 – Chi-Square test

For research question 3:

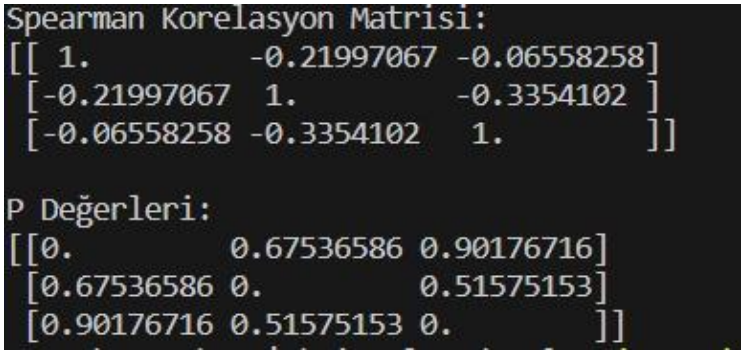

Figure 6 – Spearman Correlation Matrix test between Q7,Q10, and Q11

For research question 4:

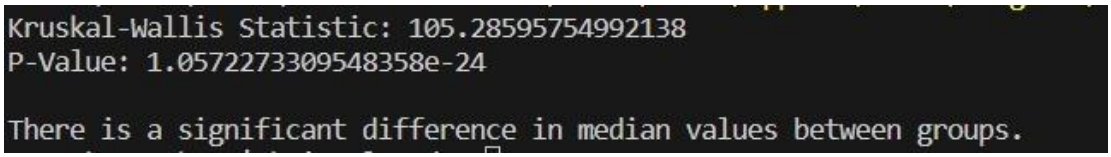

Figure 7 – Kruskal-Wallis test between Q9 and Q10

For Research question 5:

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Deviance Residuals:
    Min       1Q   Median       3Q      Max
-2.1591   0.4523   0.6410   0.7161   0.7161

Coefficients:
                                                                    Estimate
(Intercept)                                                          1.25276
Q21.6 - 2.5                                                          0.97571
Q22.6 - 3.5                                                         -0.02281
Q23.6+                                                               0.13353
Q2I have no CGPA (1'st year and preparation students can choose)     0.22534
                                                                    Std. Error
(Intercept)                                                            0.80178
Q21.6 - 2.5                                                            0.89502
Q22.6 - 3.5                                                            0.84313
Q23.6+                                                                 0.97742
Q2I have no CGPA (1'st year and preparation students can choose)       0.85868
                                                                    z value
(Intercept)                                                           1.562
Q21.6 - 2.5                                                           1.090
Q22.6 - 3.5                                                          -0.027
Q23.6+                                                                0.137
Q2I have no CGPA (1'st year and preparation students can choose)      0.262
                                                                    Pr(>|z|)
(Intercept)                                                            0.118
Q21.6 - 2.5                                                            0.276
Q22.6 - 3.5                                                            0.978
Q23.6+                                                                 0.891
Q2I have no CGPA (1'st year and preparation students can choose)        0.793

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 237.66  on 254  degrees of freedom
Residual deviance: 232.49  on 250  degrees of freedom
AIC: 242.49

Number of Fisher Scoring iterations: 4
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Figure 8 – Logistic regression model between Q2 and Q16