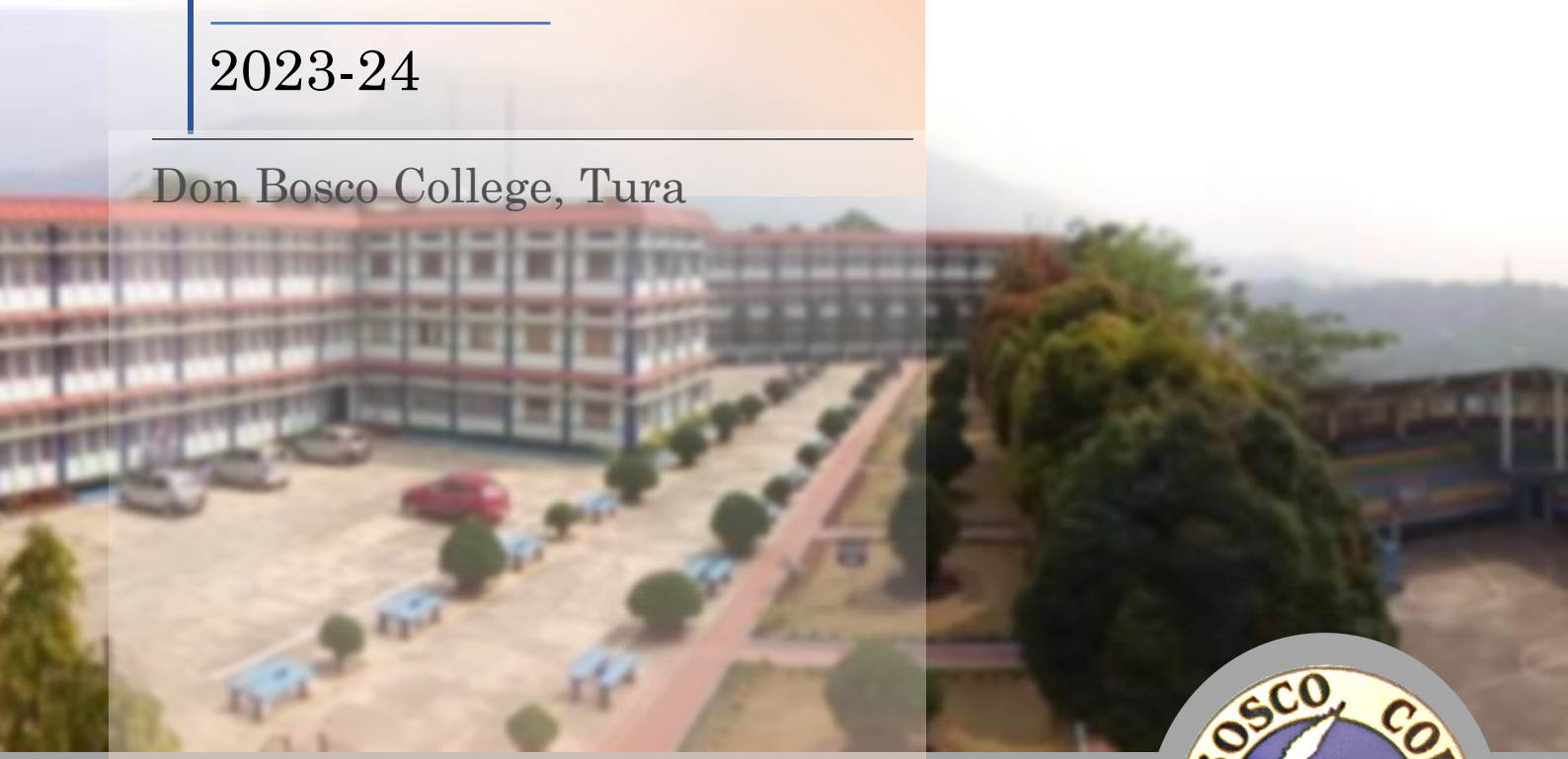
Report

on

Student Satisfaction Survey

2023-24

Don Bosco College, Tura



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Dr. Yubaraj Sharma,
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PREFACE

This report presents the findings of a **S**tudent **S**atisfaction **S**urvey (SSS) carried out for the academic session 2023-24 at Don Bosco College, Tura, an affiliated college under North-Eastern Hill University. The aim of the survey was to gather student feedback on various aspects of their academic experience and personal development in the college.

The SSS survey within the framework of the National Assessment and Accreditation Council (NAAC) guidelines employs a 5-point Likert-type scale, allowing students to rate their satisfaction on a graded scale from 0 (worst) to 4 (best) experience. NAAC uses a numeric score equal to the overall average/mean as the key indicator for SSS. Recognizing the limitations of relying solely on average satisfaction scores, we have extended our analysis to include use of statistical techniques for deeper understanding of the data. It is hoped that the extended analysis of the survey responses will provide actionable insights for the college administration to strengthen its academic and support services, enhance student engagement, and cultivate a more enriching learning environment at the institution. The SSS survey is a demonstration of our commitment to a sensitive environment where student voices are heard and valued.

Once again, I would like to extend my sincere gratitude to all participating students for their valuable feedback, to the administration including the IQAC and the departments for facilitating the SSS exercise. All stakeholders: students, faculty and administration of the college are deeply committed to its betterment and in fostering a vibrant academic environment; the annual exercise captured in this report is a small testament of that commitment.

Dr. Yubaraj Sharma

SSS coordinator,
Don Bosco College, Tura
Meghalaya

MESSAGE FROM THE PRINCIPAL

The Student Satisfaction Survey (SSS) is a cornerstone of Don Bosco College's commitment to academic excellence and continuous improvement. As mandated by the National Assessment and Accreditation Council (NAAC), the SSS is a vital tool for assessing student satisfaction levels and identifying areas for enhancement.

The insights gained from the SSS help the college identify areas where students may be facing challenges or have unmet needs, enabling the college to implement targeted interventions to enhance the overall learning experience. The SSS also helps the college maintain high standards of quality in teaching, learning, and research. By addressing issues raised by students, the college can continuously improve its academic offerings.

We would like to express our sincere thanks to Dr. Yubaraj Sharma, the SSS Coordinator, and Dr. Barbara S. Sangma, the IQAC Coordinator, for their invaluable contributions in leading this initiative. We also recognize the hard work and dedication of all IQAC Criteria Coordinators in ensuring smooth completion of the SSS process.

We urge all students to actively participate in the SSS. Your feedback is essential in shaping the future of Don Bosco College and ensuring that it remains a premier institution of higher learning. By sharing your thoughts and opinions, you contribute to creating a vibrant and supportive campus environment.

Fr. Januarius S Sangma SDB

Principal,
Don Bosco College, Tura
Meghalaya

MESSAGE FROM THE IQAC COORDINATOR

A Student Satisfaction Survey (SSS) was conducted for the year 2023-'24 aimed at gathering student feedback on various aspects of their academic experience and personal development in the college. The Survey falls within the purview of Internal Quality Assurance Cell (IQAC) and this Cell is grateful to Dr. Yubaraj Sharma, Assistant Professor, Deportment of Physics and the Coordinator of Criterion 2 (AQAR) for having conducted the SSS and for carrying out a comprehensive and a truly commendable analysis.

Not disregarding the outcome, the Survey itself is a very healthy exercise as it looks at the teaching-learning process from the students' perspective. Generally, it is the teachers who always analyze the students' performance; however, SSS gives opportunities for students to express their feelings regarding the whole teaching-learning environment. While giving room for a small percentage of discount, the Survey can and is a pointer to the real academic situation in an institution. Therefore, the College can learn a lot from the analysis and plan and revise its general approach to teaching-learning process and produce better results.

"The final satisfaction score/key indicator – the overall measure of satisfaction was calculated to be 3.00. This value is marginally below our target level of 3.2." This being so, the IQAC of the College is committed to bringing the faculty into confidence and working out a solution that will show a long-term fruitful teaching-learning atmosphere which will ultimately bring about improvement in the learning process of everyone concerned.

Dr. Barbara S. Sangma

IQAC Coordinator,

Don Bosco College, Tura

Meghalaya

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INTRODUCTION

There are very few tools available for the measurement of quality of non-physical phenomena/subjective items; surveys are one of them. Thus, it is no surprise that to gauge the satisfaction level of the principal stakeholders of an educational institution – the students, a survey, aptly named the Student Satisfaction Survey (SSS) has been in practice for some time. SSS is a valuable tool for colleges and other educational institutions to systematically assess the efficacy of their educational services and identify areas for improvement. Moreover, SSS can also benefit students by giving them a voice in shaping their education and influencing the decisions that affect them. The student satisfaction survey has become a routine practice for assessing the feedback of students on various aspects of their interaction with the Higher Education Institution (HEI) he/she is enrolled in, ever since the National Assessment and Accreditation Council (NAAC) has mandated that such surveys be conducted both as a part of the Annual Quality Assurance Report (AQAR) as well as the Self Study Report (SSR) submitted for accreditation purposes. While NAAC has provided some guidelines for the SSS process to be conducted for SSR (to be undertaken by NAAC), but there appears to be no set guidelines for SSS for AQAR (to be undertaken by HEI) except that the HEIs are given some leeway for the design of their own questionnaire. We presume that the analysis of the SSS survey is to be done in a similar manner for consistency.

In their guideline[1] for student satisfaction survey (SSS), the National Assessment and Accreditation Council (NAAC) write the following

> ***"About questionnaire:***
>
> *The questionnaire will be based on the Likert type scale, that means the responses are scaled on a scale of 0 to 4, with the most positive response being rated as 4 and the most negative response being rated as 0. The score emerging out of the survey is part of the second criterion on Teaching—Learning and Evaluation, out of the seven NAAC criteria. The questionnaire consists of several facets of the*

[1] http://naac.gov.in/images/docs/apply_online/RAF-SSS-Guideline_29-1-2020.pdf.

> *teaching learning process. Questions vary from specific teaching skills of the teacher, to his overall approach to the educational process. Specific skills of the teacher like, subject knowledge, communication skills, class preparation, and use of ICT tools are part of the questionnaire. The overall approach of the teacher and institution with respect to providing the right environment, motivation, interpersonal relationships, feedback etc. forms the second major component of the questionnaire. Twenty of the twenty one questions are objective in nature, while one question is open ended to elicit observations and suggestions for improvements providing an opportunity to the student to give suggestions and criticisms in their own words. Analysis of the survey would be done using software which will aggregate the responses and generate the score. The score will range from a minimum of 0 to a maximum of 4 on a five point scale and would affect the overall score of second criteria on Teaching-Learning and evaluation. Responses to the open ended question would also be aggregated to find out the most common suggestion and criticisms emerging out of the survey."*

As is mentioned in the guideline, the SSS conducted by NAAC as a part of the accreditation process consists of 20 objective questions (multiple choice questions or MCQs) which are '*based on the Likert type scale*' and 1 open-ended question – a total of 21 questions in the questionnaire.

For conducting the analysis, NAAC states, in the same guideline, the following:

> ***"Analysis of objective questions:***
>
> *There are twenty objective questions and students will respond on a scale of 4 to 0, with the most positive response rated as 4 and most negative response rated as 0. The mean score for each question will be calculated and the overall mean will be arrived at. This figure will range from 4 to 0 and will give the mean satisfaction level of the students for the particular institute. This figure in the range of 4 to 0 will be the score of key indicator 'Student Satisfaction Survey' (2.7.1) which is part of criterion II on Teaching – Learning and Evaluation*
>
> ***Analysis of the open-ended question:***
>
> *The students are asked to give three observations/suggestions to improve the overall teaching-- learning experience in the institution. Analysis would be carried out by aggregating the most occurring suggestions in the student responses. This would provide an idea of*

> *the most general expectations, observations and suggestions from the students. This Information can be provided to peer team conducting onsite visit, to be used for validation as well as peer team report preparation."*

Thus, the analysis of the MCQ questionnaire consists of evaluating a score taken as the overall mean of the numeric ratings given by the students. This SSS score will be the key indicator for relevant metric (2.7.1) of the second criterion of the SSR. However, we could not find any details about the SSS to be conducted in fulfilment of AQAR requirements; the guidelines for AQAR[2] under metric 2.7.1 simply mention:

> *"Student Satisfaction Survey (SSS) on overall institutional performance (Institution may design its own questionnaire) (results and details need to be provided as a weblink)"*

Although, freedom is given to design our own questionnaire, but, we decided to use the questionnaire provided by NAAC[3] without any change, assuming that much forethought and expertise might have gone in the preparation of the same.

Details of the survey

The survey was conducted online via 'Google Form'. This method was chosen due to its familiarity, accessibility and ease. The survey was conducted between 15th December 2023 to 18th December 2023; the students were thus given a 4-day window in which to complete the survey. Other details of the survey like the number of participants etc. are given in the beginning of the next chapter.

Brief overview of the analysis carried out in the SSS report

The SSS score/key indicator may be beneficial for comparison, however, the rich feedback received through the survey will be underutilized if we restrict ourselves to just the score. Therefore, we have undertaken a few additional sets of analysis

[2] Page 29 of the manual available at http://naac.gov.in/images/aqar_online_20-21/3AQAR_Guideline_Affiliated_Constituent_UG_Colleges_26042022.pdf.

[3] Retrieved from http://naac.gov.in/docs/Apply%20now/SSS-Questinnaire_Students.pdf.

on the survey to extract patterns that may provide deeper insights into the opinion held by the students with regards to the college.

In addition to analysing the entire data set, we have also tried to group the data into different demographics and carry out analysis in order to understanding how these groups responded. For such analysis, the data was divided into groupings with the following demographic categories:

Demography	Groups within the demography
Gender	• Female
	• Male
Semester	• 2nd Semester
	• 4th Semester
	• 6th Semester
Shift	• Morning Shift
	• Day Shift

Analysis of the MCQ type questions

As is mentioned in the NAAC guidelines for SSS and the questions in the questionnaire, the MCQ type questions are based on 'Likert type scale'. The Likert scale, introduced by R. Likert in 1932 (Likert, 1932), is a psychometric scale commonly involved in research and used for gauging people's opinions and attitudes to a topic/subject matter. They have enjoyed enduring popularity probably due to their balance of simplicity and efficacy in capturing subjective assessments.

In his original work, Likert used a five-point scale i.e., respondents are to choose one option that best corresponds with how they feel about the statement or question from a spectrum of 5 options ranked according to quality/agreement from high (best) to low (worst) or vice-versa. Likert scales with fewer or more options than 5 have also been used in research (Matell & Jacoby, 1971; DeVellis, 2017). The option at the midpoint of a Likert scale is often a neutral item and there have been some debates for removing it (i.e., use even number of options) to encourage decisive responses. Aside from the number of options, debate has more strongly

raged about the appropriate statistical analysis of Likert data. This contention stems from the disagreement in the classification of Likert data as either ordinal or interval (Sullivan & Artino, 2013). Ordinal data implies a rank order between categories, but unspecified intervals between them, which is not amenable to parametric statistical analysis. Interval data possesses both order and specified intervals and therefore amenable to parametric statistics. In the present case, since numeric equivalent were specified along with the options in the questionnaire, we have justification for treating the Likert data as interval data. This has emboldened us to use One-Way ANOVA and standard deviation in our analysis.

The following are some statistics that were calculated for the analysis of the survey data in the present report. Most of the analysis were carried out using the 'pandas' library of Python programming language.

Frequency/Count: This is the total number of responses that a particular option of the MCQ type question received.

Percentage: This is the percentage share of a particular option of the MCQ type question received. This is calculated as follows:

$$\text{Percentage} = \frac{(total\ count\ of\ the\ particular\ option)}{Total\ number\ of\ responses} \times 100$$

One-Way ANOVA: The one-way 'analysis of variance' or ANOVA compares the means of two[4] or more independent groups to determine whether there is statistical evidence that the associated population means are significantly different. As a parametric test, one-way ANOVA assumes normally distributed populations within each group and equal variances across all group; the null hypothesis posits that the population means of all groups are equivalent, while the alternative hypothesis asserts that at least one group mean differs significantly from the others. In our analysis, we adopted the conventional significance level of 5% ($\alpha = 0.05$), which implies that we are willing to accept a 5% risk of rejecting the null hypothesis even when such a difference in means does not truly exist in the population (Howell, 2013).

[4] One-way ANOVA for two groups is equivalent to a *t*-test.

While we do recognize the importance of theoretical understanding, we have opted to forego presenting the theory/formula for ANOVA calculations to minimize inessential jargon and diversion; suffice it to say that the ANOVA was calculated in the present work using the 'scipy.stats' package of the Python programming language.

Cronbach's alpha of the survey: Cronbach's α (alpha) (Cronbach, 1951) is a widely used statistic employed in psychometrics and related fields to assess the internal consistency /reliability of a set of survey items or ratings. In simpler words, it tells us how reliable i.e., non-random are the responses of a questionnaire. Cronbach's α value ranges from 0 to 1 scale. Higher values of α (closer to 1) would imply that high degree of internal consistency i.e., if a respondent gives a positive response for one question, they are also likely to provide positive responses for the other questions and vice-versa. Cronbach's α can be calculated using the following formula (Bland & Altman, 1997).

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum s_i^2}{s_T^2}\right)$$

Where k is the number of items, s_i^2 is the variance of the i^{th} item and s_T^2 is the total score.[5]

The threshold value of Cronbach's α for acceptable internal consistency generally varies between 0.7 and 0.9 depending on the research context (Bland & Altman, 1997). Given the biases inherent in the present type of surveys, we have applied the stricter value of 0.9 as the threshold for acceptability.

Analysis of the open-ended question

As suggested in the guidelines issued by NAAC, we analysed the open-ended question of the SSS questionnaire by aggregating the most occurring suggestions in the student responses. For this a set of keywords based on the broad area of response were introduced and assigned to each open-type response. A frequency count of the keywords led us to the most pertinent issues raised by the students.

[5] see appendix for the Python code used for calculation of Cronbach's α.

We constructed a word cloud to visualize what words that were most common in the response of the students using the `wordcloud` python library maintained by Andreas Mueller[6].

For unsupervised analysis, we extracted key phrases from the students' open-ended responses using the popular Rapid Automatic Keyword Extraction (RAKE) algorithm via the `rake-nltk`[7] python library. For visualization, we again used a word-cloud. RAKE is a domain-agnostic algorithm that identifies key phrases within a text corpus by analysing both the frequency of individual words and their co-occurrences with other words in the text. This approach is particularly well-suited for analysing unstructured text data, such as the textual feedback received from customers or students, as it allows for the extraction of thematic content without imposing pre-defined categories.

[6] https://github.com/amueller/word_cloud.

[7] See https://pypi.org/project/rake-nltk/. NLTK stands for Natural Language Toolkit.

QUESTION-WISE ANALYSIS OF RESPONSE DATA

We start our analysis by first looking at the responses obtained for individual questions of the MCQ type in the questionnaire. To make it easier to compare, we have also expressed the count data in percentage. But first, we offer some critical demographic data from the survey in the section below.

Basic information about the survey

Total number of respondents: 331

Total number of Female respondents: 190

Total number of Male respondents: 141

Total number of 6th Semester respondents: 190

Total number of 4th Semester respondents: 89

Total number of 2nd Semester respondents: 52

Total number of Day shift respondents: 250

Total number of Morning shift respondents: 75

Total number of Evening shift respondents: 6

We see that the number of responses received from the various semester are comparable, but there is some disparity in the number of responses in terms of demographics segregated by gender and by shift.

In the next section, we look at the number of responses received for each option of the individual MCQ type questions, presented in tabular form. Questions and their corresponding analyses are arranged in the order that they appear in the questionnaire.
Alongside the frequency of responses, we have provided percentage values (rounded to the first decimal) to facilitate comparisons. For additional insights, bar-graphs showing the data segregated by gender, semester and shift are also plotted for individual questions.

Q1. How much of the syllabus was covered in the class?

Table 1: *Count and percentage values of the response for question-1 of the questionnaire.*

Options	0 - Below 30%	1 - 30 to 54%	2 - 55 to 69%	3 - 70 to 84%	4 - 85 to 100%
No. of responses	5	22	28	107	169
Percentage of responses	1.5 %	6.6 %	8.5 %	32.3 %	51.1 %

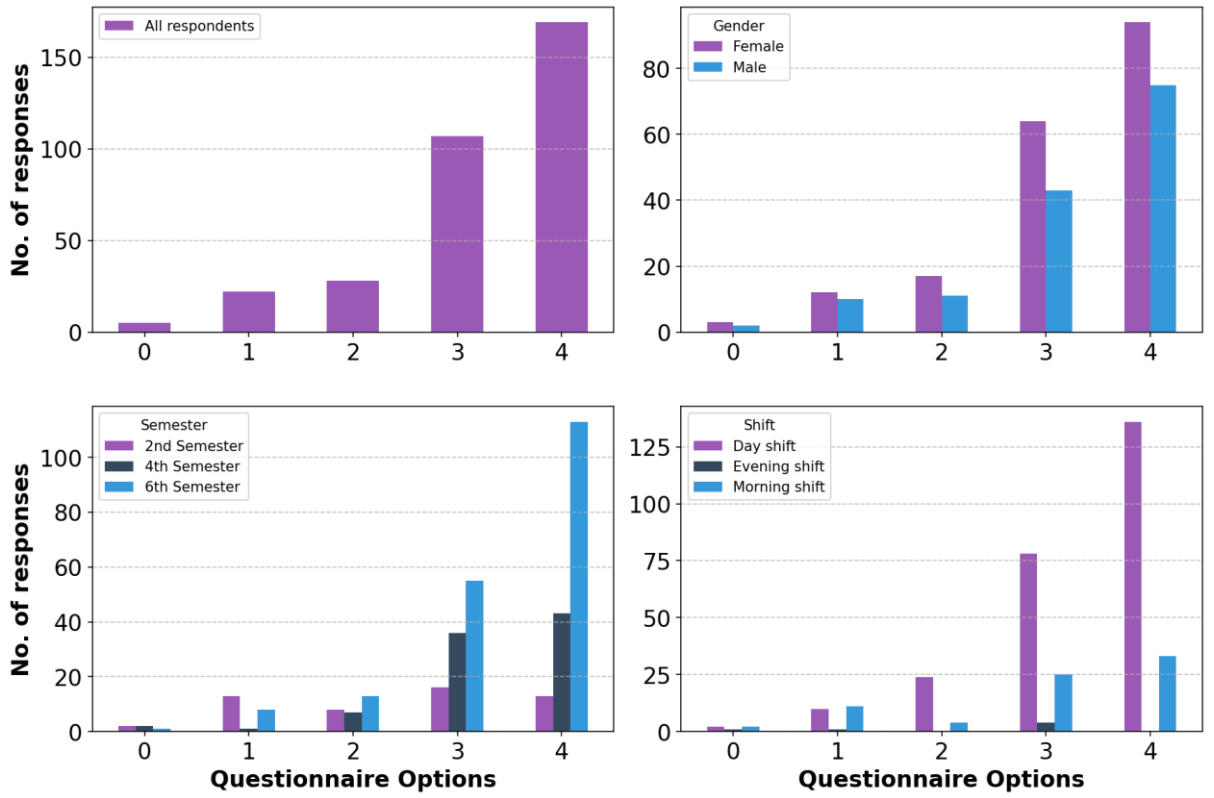


Figure 1: *Bar charts of the percentage of response obtained for various options for question-1 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q2. How well did the teachers prepare for the classes?

Table 2: *Count and percentage values of the response for question-2 of the questionnaire.*

Options	0 – Won't teach at all	1 – Indifferently	2 – Poorly	3 – Satisfactorily	4 – Thoroughly
No. of responses	4	3	15	183	126
Percentage of responses	1.2 %	0.9 %	4.5 %	55.3 %	38.1 %

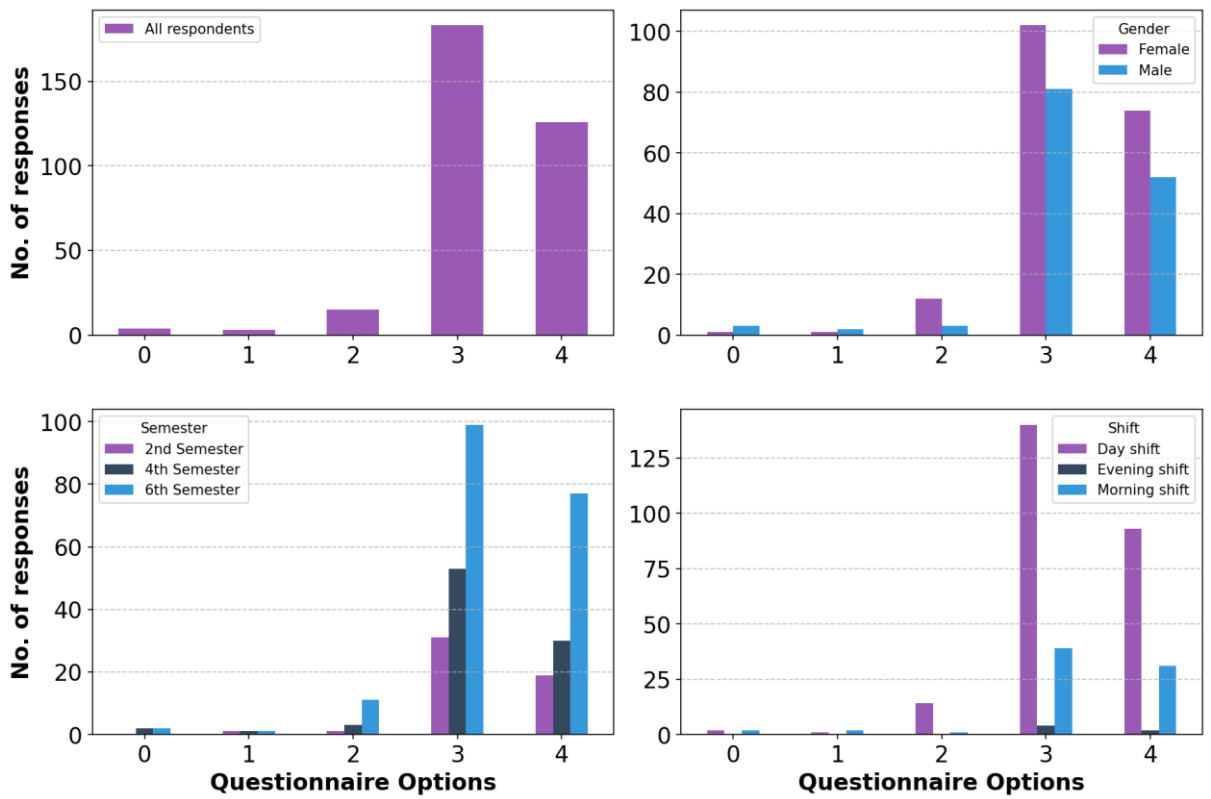


Figure 2: *Bar charts of the percentage of response obtained for various options for question-2 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q3. How well were the teachers able to communicate?

Table 3: *Count and percentage values of the response for question-3 of the questionnaire.*

Options	0– Very poor communication	1– Generally ineffective	2 – Just satisfactorily	3 – Sometimes effective	4 – Always effective
No. of responses	5	7	59	90	170
Percentage of responses	1.5 %	2.1 %	17.8 %	27.2 %	51.4 %

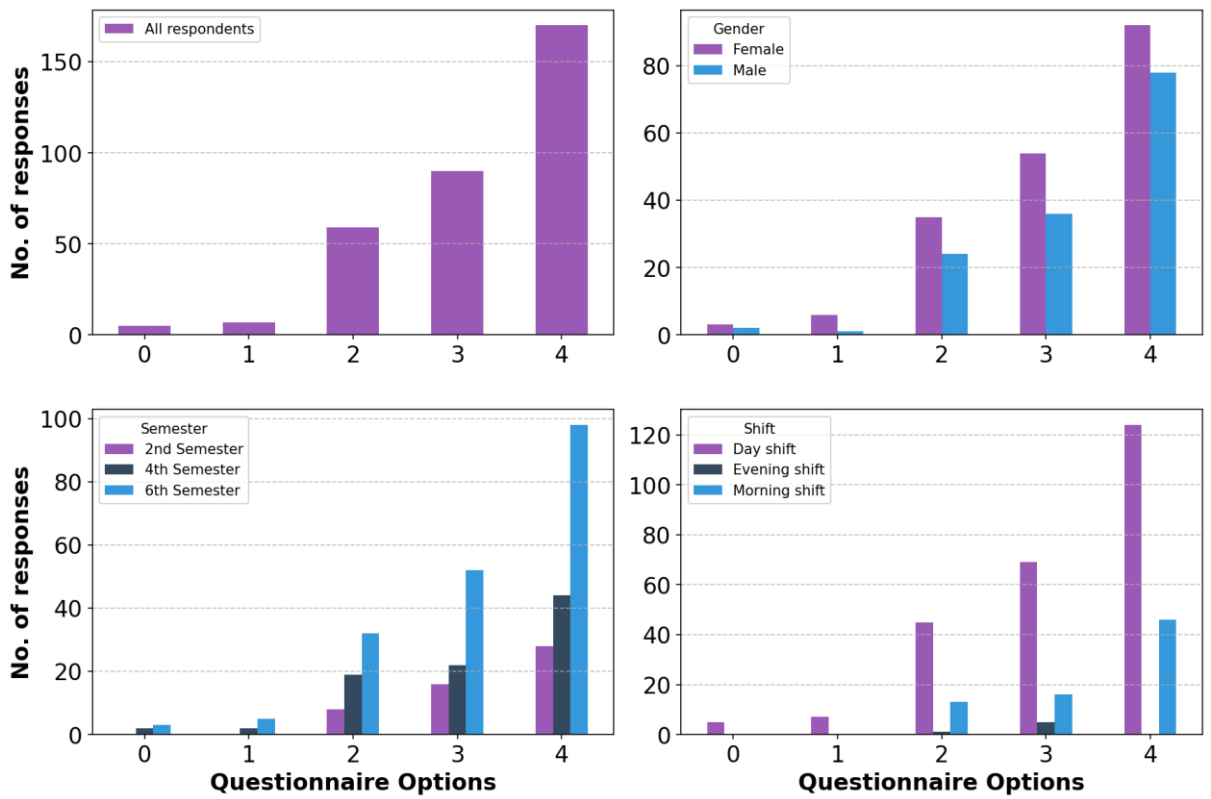


Figure 3: *Bar charts of the percentage of response obtained for various options for question-3 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q4. The teacher's approach to teaching can best be described as

Table 4: *Count and percentage values of the response for question-4 of the questionnaire.*

Options	0 – Poor	1 – Fair	2 – Good	3 – Very good	4– Excellent
No. of responses	5	18	74	150	84
Percentage of responses	1.5 %	5.4 %	22.4 %	45.3 %	25.4 %

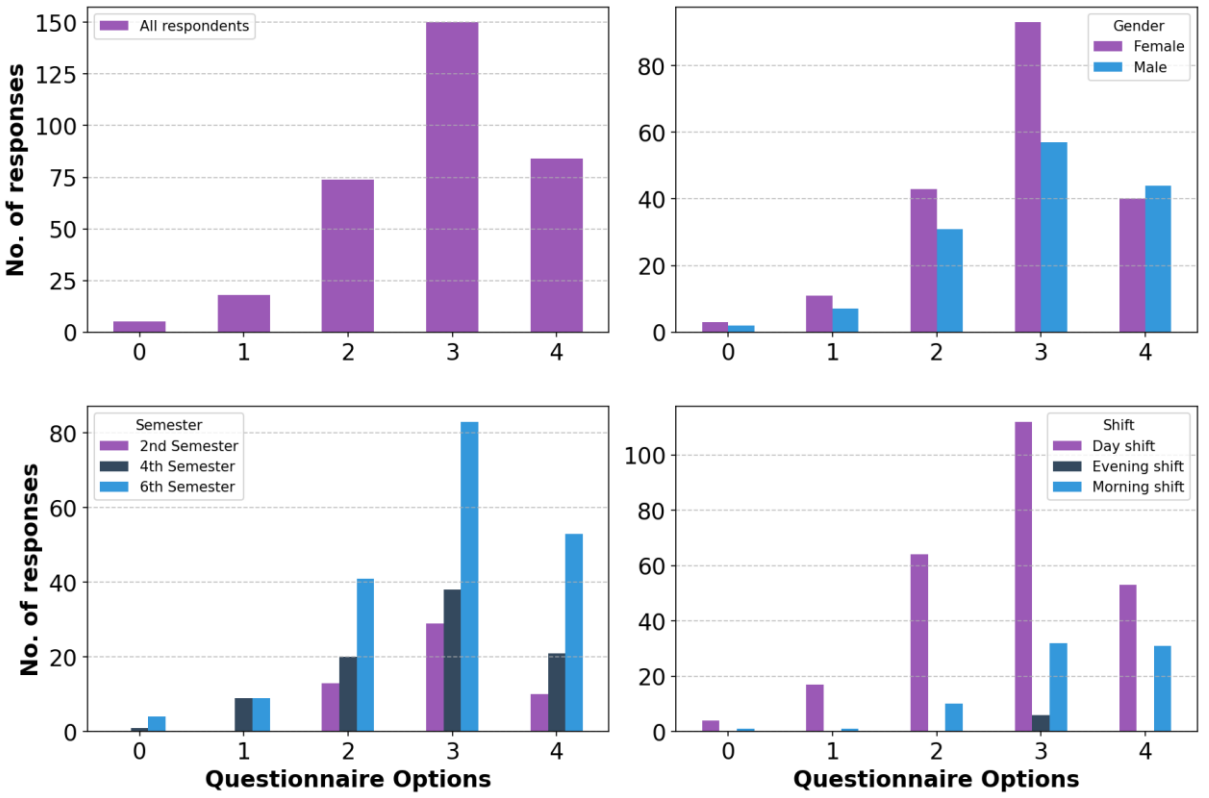


Figure 4: *Bar charts of the percentage of response obtained for various options for question-4 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q5. Fairness of the internal evaluation process by the teachers.

Table 5: *Count and percentage values of the response for question-5 of the questionnaire.*

Options	0– Unfair	1 – Usually unfair	2 – Sometimes unfair	3 – Usually fair	4 – Always fair
No. of responses	4	3	55	136	133
Percentage of responses	1.2 %	0.9 %	16.6 %	41.1 %	40.2 %

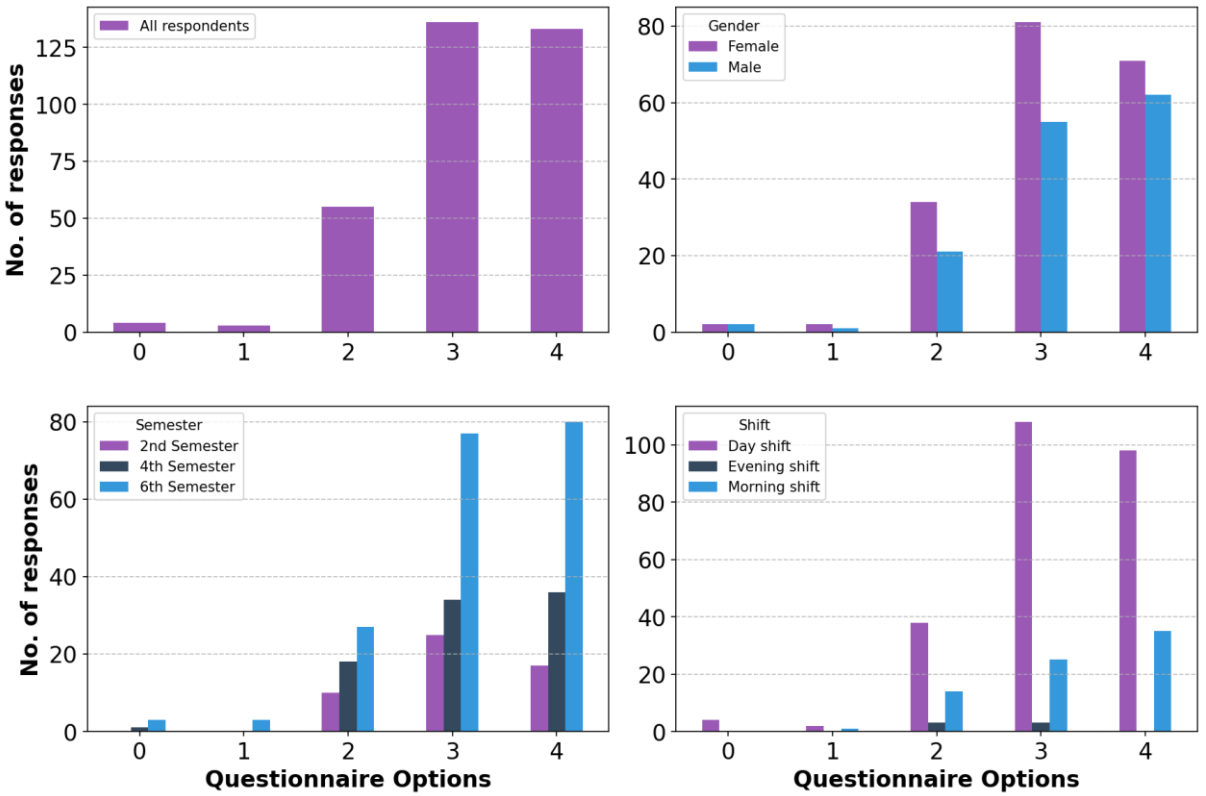


Figure 5: *Bar charts of the percentage of response obtained for various options for question-5 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q6. Was your performance in assignments discussed with you?

Table 6: *Count and percentage values of the response for question-6 of the questionnaire.*

Options	0– Never	1 – Rarely	2 – Occasionally/Sometimes	3 – Usually	4 – Every time
No. of responses	17	15	106	94	99
Percentage of responses	5.1 %	4.5 %	32.0 %	28.4 %	29.9 %

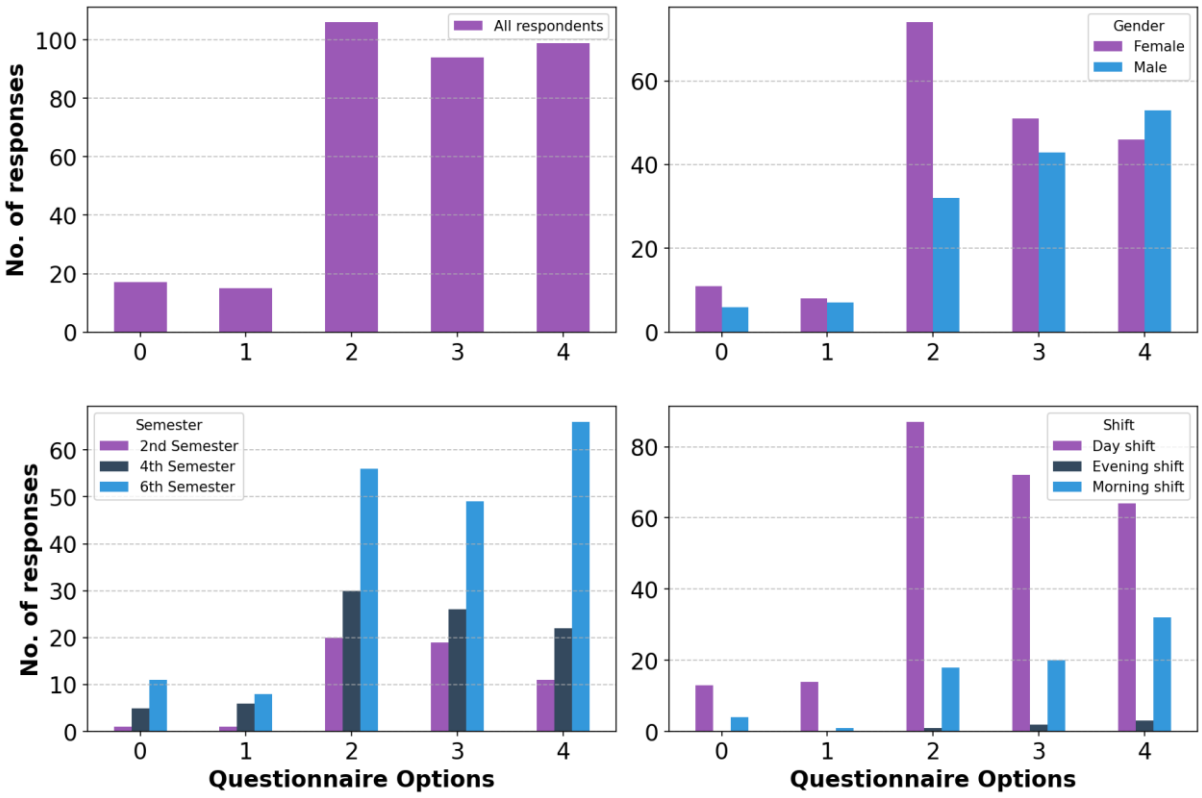


Figure 6: *Bar charts of the percentage of response obtained for various options for question-6 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q7. The institute takes active interest in promoting internship, student exchange, field visit opportunities for students.

Table 7: *Count and percentage values of the response for question-7 of the questionnaire.*

Options	0– Never	1 – Rarely	2 – Sometimes	3 – Often	4 – Regularly
No. of responses	40	31	93	80	87
Percentage of responses	12.1 %	9.4 %	28.1 %	24.2 %	26.3 %

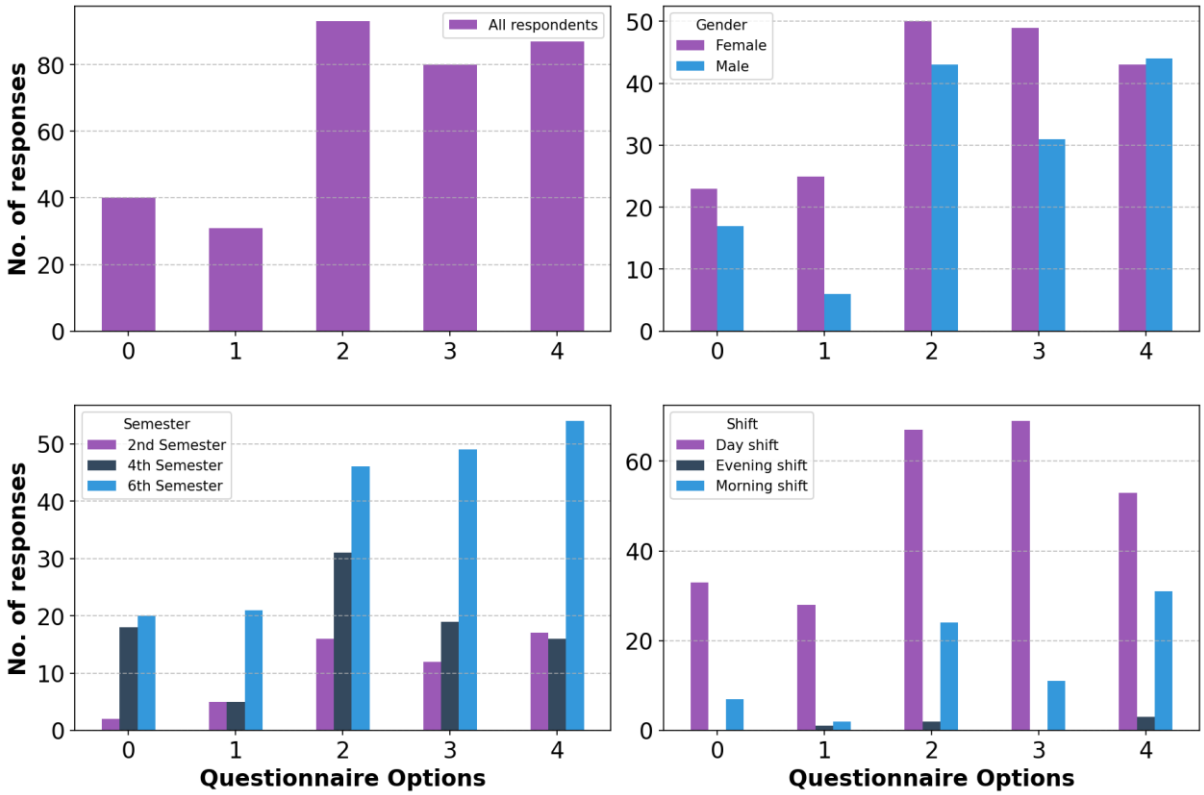


Figure 7: *Bar charts of the percentage of response obtained for various options for question-7 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q8. The teaching and mentoring process in your institution facilitates you in cognitive, social and emotional growth.

Table 8: *Count and percentage values of the response for question-8 of the questionnaire.*

Options	0 – Not at all	1 – Marginally	2 – Moderately	3 – Very well	4 – Significantly
No. of responses	12	15	79	170	55
Percentage of responses	3.6 %	4.5 %	23.9 %	51.4 %	16.6 %

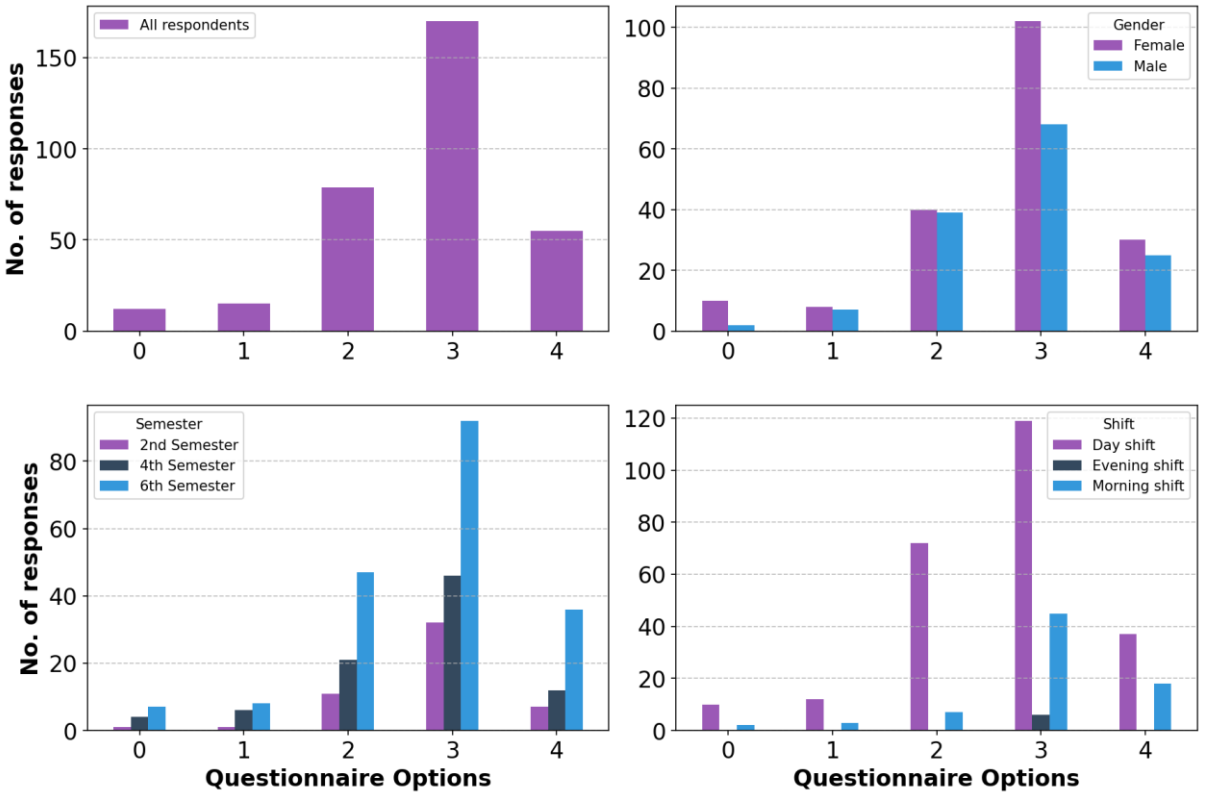


Figure 8: *Bar charts of the percentage of response obtained for various options for question-8 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q9. The institution provides multiple opportunities to learn and grow.

Table 9: *Count and percentage values of the response for question-9 of the questionnaire.*

Options	0– Strongly disagree	1 – Disagree	2 – Neutral	3 – Agree	4 – Strongly agree
No. of responses	4	5	44	163	115
Percentage of responses	1.2 %	1.5 %	13.3 %	49.2 %	34.7 %

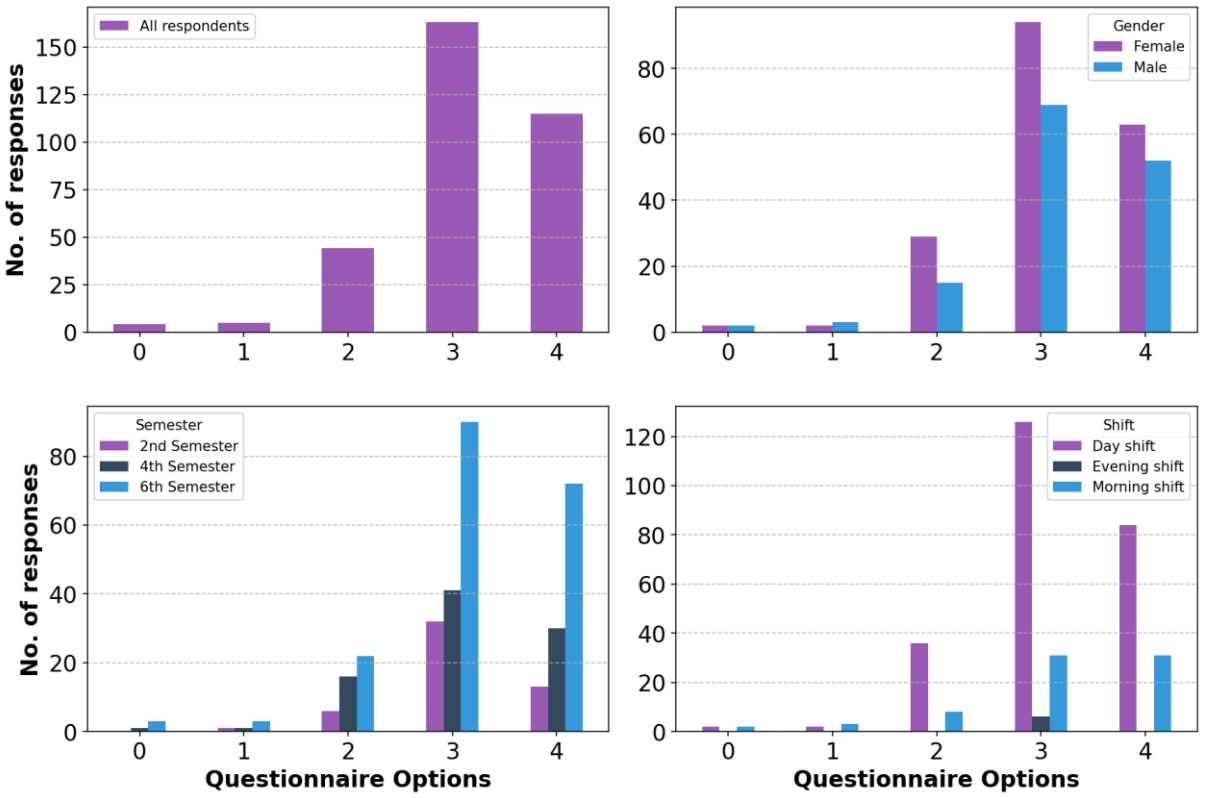


Figure 9: *Bar charts of the percentage of response obtained for various options for question-9 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q10. Teachers inform you about your expected competencies, course outcomes and programme outcomes.

Table 10: *Count and percentage values of the response for question-10 of the questionnaire.*

Options	0 – Never	1 – Rarely	2 – Occasionally/Sometimes	3 – Usually	4 – Every time
No. of responses	5	13	60	109	144
Percentage of responses	1.5 %	3.9 %	18.1 %	32.9 %	43.5 %

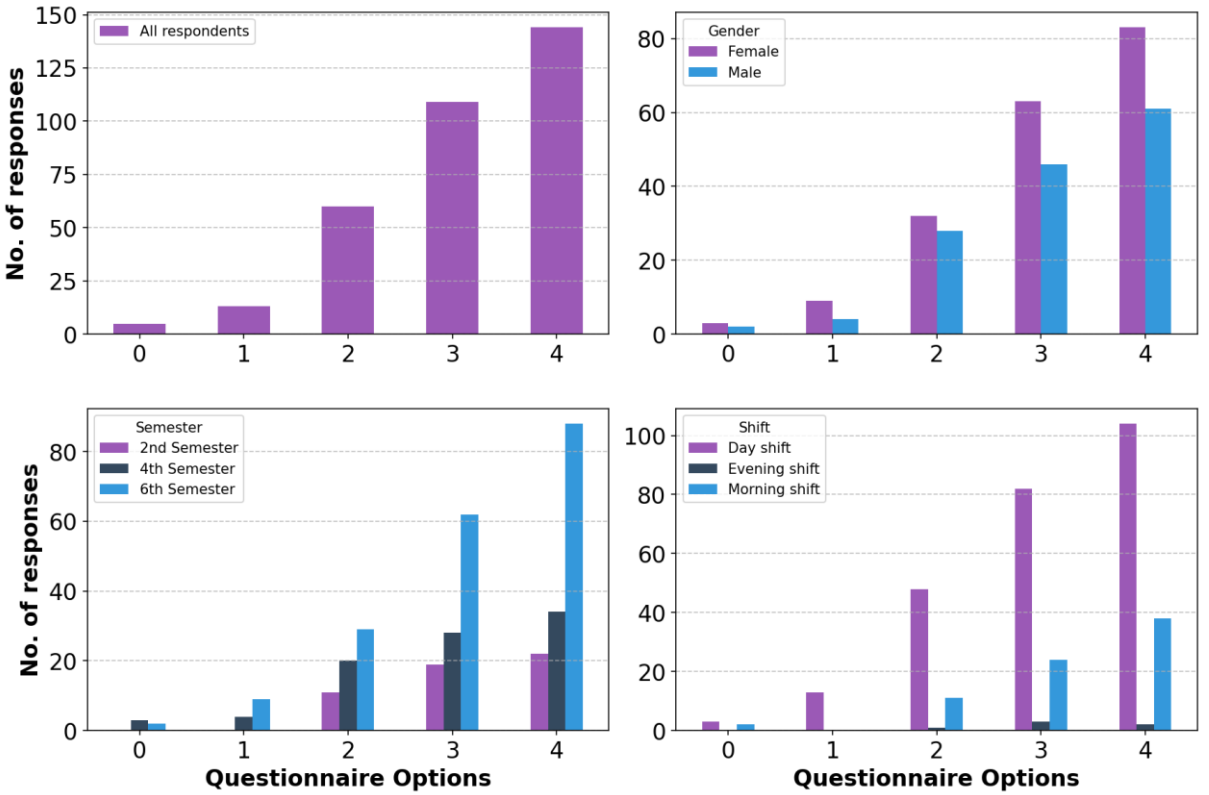


Figure 10: *Bar charts of the percentage of response obtained for various options for question-10 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q11. Your mentor does a necessary follow-up with an assigned task to you.

Table 11: *Count and percentage values of the response for question-11 of the questionnaire.*

Options	0 – I don't have a mentor	1 – Rarely	2 – Occasionally/Sometimes	3 – Usually	4 – Every time
No. of responses	9	17	77	131	97
Percentage of responses	2.7 %	5.1 %	23.3 %	39.6 %	29.3 %

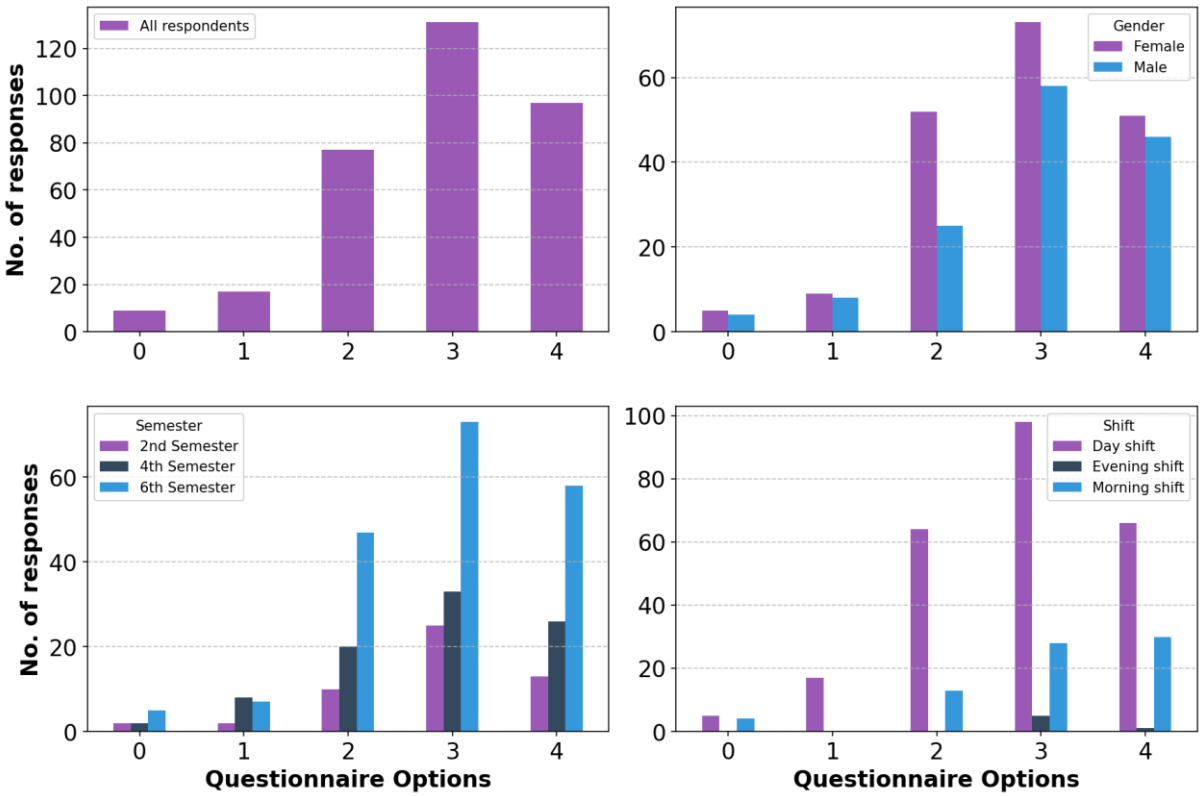


Figure 11: *Bar charts of the percentage of response obtained for various options for question-11 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q12. The teachers illustrate the concepts through examples and applications.

Table 12: *Count and percentage values of the response for question-12 of the questionnaire.*

Options	0 – Never	1– Rarely	2 – Occasionally/Sometimes	3 – Usually	4 – Every time
No. of responses	3	13	38	113	164
Percentage of responses	0.9 %	3.9 %	11.5 %	34.1 %	49.5 %

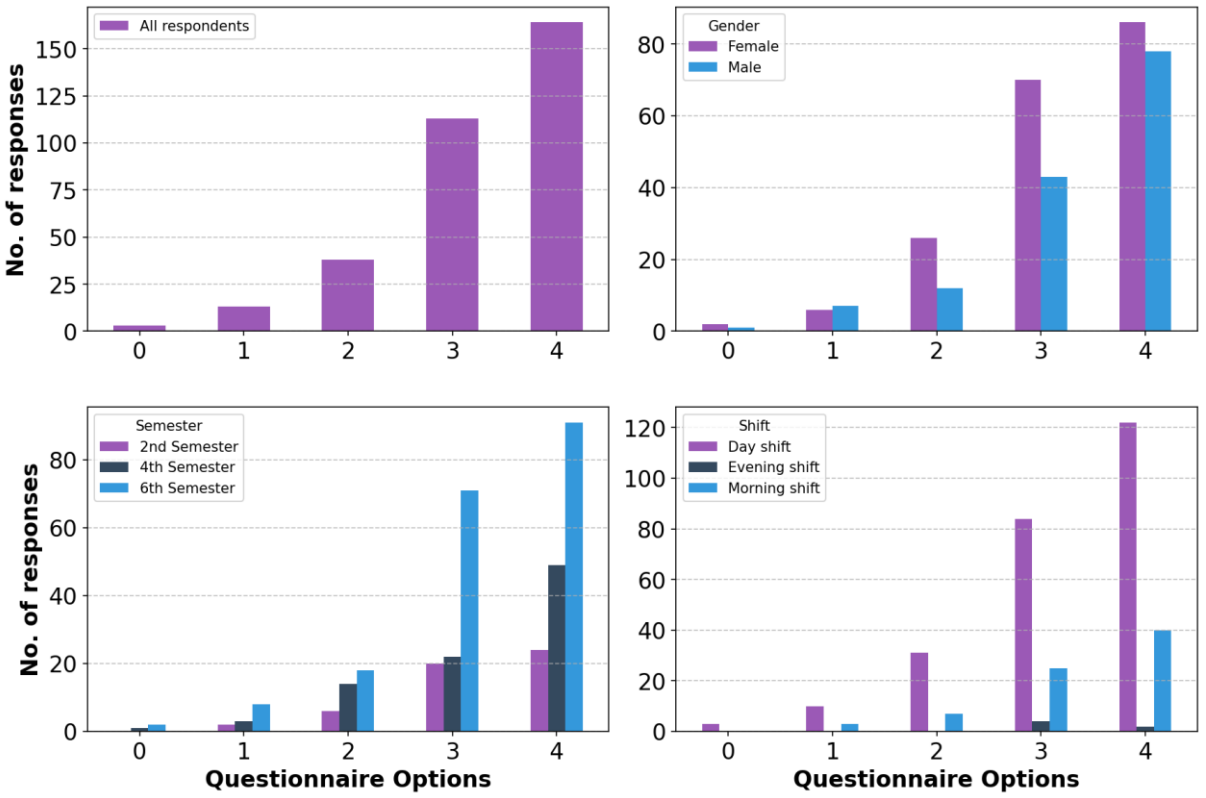


Figure 12: *Bar charts of the percentage of response obtained for various options for question-12 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q13. The teachers identify your strengths and encourage you with providing right level of challenges

Table 13: *Count and percentage values of the response for question-13 of the questionnaire.*

Options	0– Unable to	1 – Slightly	2 – Partially	3 – Reasonably	4 – Fully
No. of responses	13	24	52	116	126
Percentage of responses	3.9 %	7.3 %	15.7 %	35.0 %	38.1 %

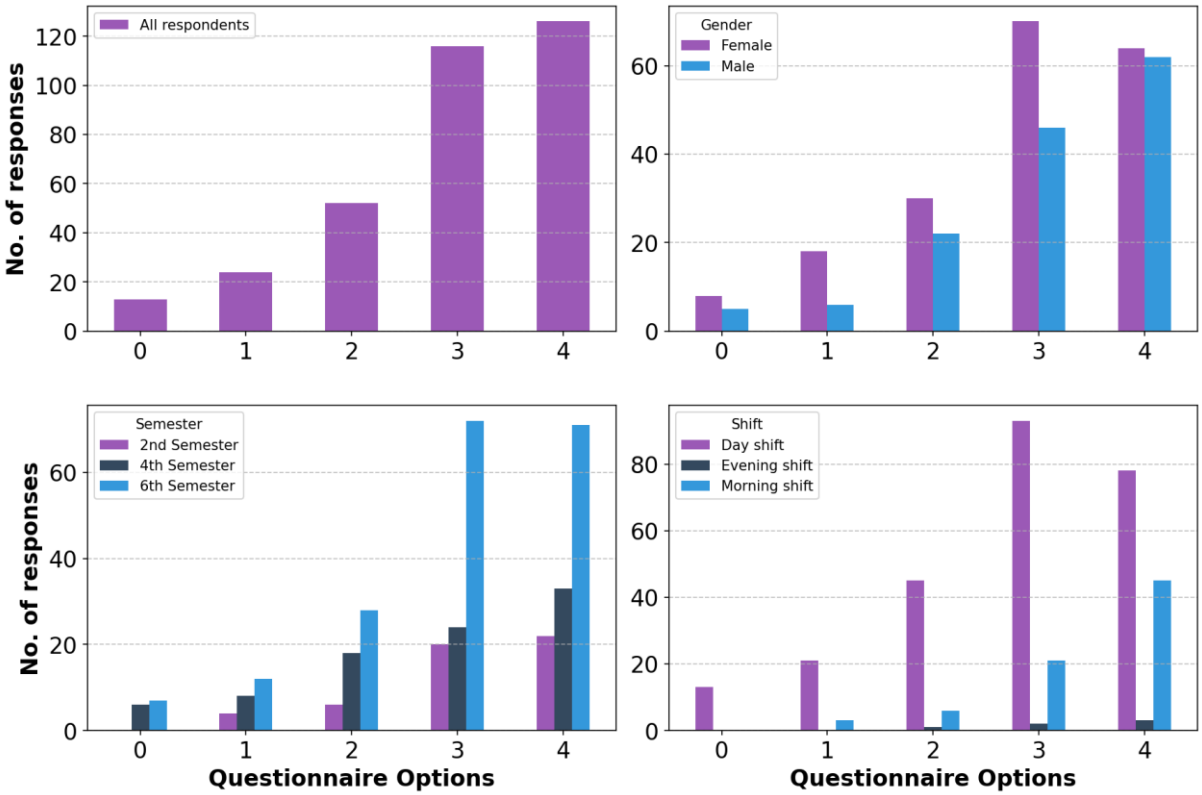


Figure 13: *Bar charts of the percentage of response obtained for various options for question-13 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q14. Teachers are able to identify your weaknesses and help you to overcome them.

Table 14: *Count and percentage values of the response for question-14 of the questionnaire.*

Options	0 – Never	1 – Rarely	2 – Occasionally/Sometimes	3 – Usually	4 – Every time
No. of responses	28	38	72	84	109
Percentage of responses	8.5 %	11.5 %	21.8 %	25.4 %	32.9 %

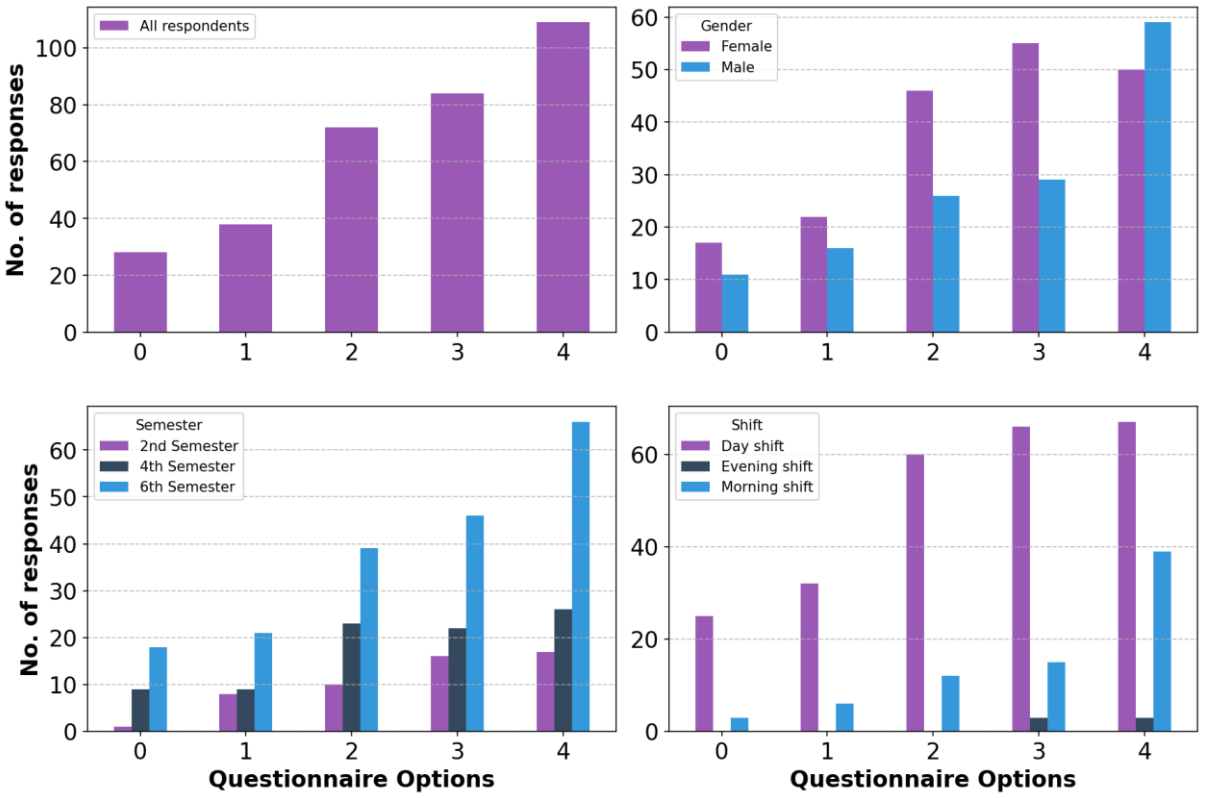


Figure 14: *Bar charts of the percentage of response obtained for various options for question-14 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q15. The institution makes effort to engage students in the monitoring, review and continuous quality improvement of the teaching learning process.

Table 15: *Count and percentage values of the response for question-15 of the questionnaire.*

Options	0 – Strongly disagree	1 – Disagree	2 – Neutral	3 – Agree	4 – Strongly agree
No. of responses	5	5	48	174	99
Percentage of responses	1.5 %	1.5 %	14.5 %	52.6 %	29.9 %

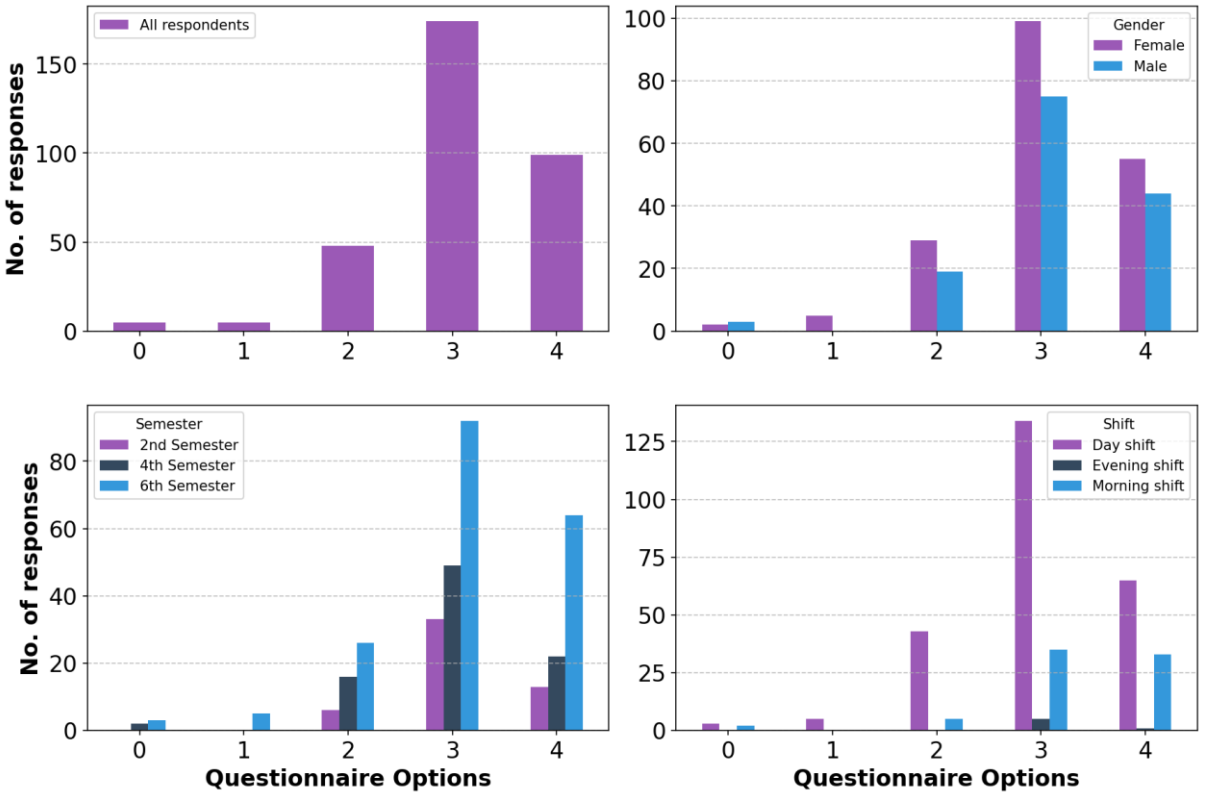


Figure 15: *Bar charts of the percentage of response obtained for various options for question-15 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q16. The institute/ teachers use student centric methods, such as experiential learning, participative learning and problem solving methodologies for enhancing learning experiences.

Table 16: *Count and percentage values of the response for question-16 of the questionnaire.*

Options	0 – Not at all	1 – Very little	2 – Some what	3 – Moderate	4 – To a great extent
No. of responses	8	26	40	147	110
Percentage of responses	2.4 %	7.9 %	12.1 %	44.4 %	33.2 %

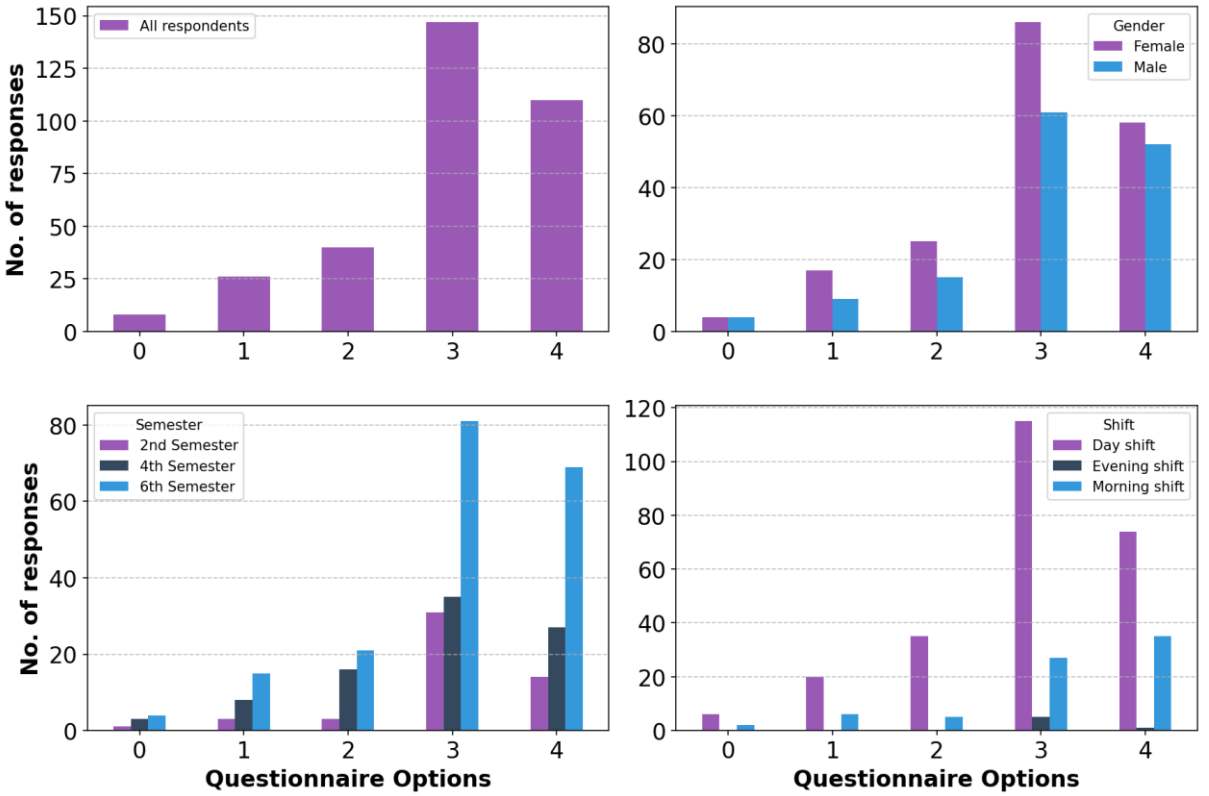


Figure 16: *Bar charts of the percentage of response obtained for various options for question-16 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q17. Teachers encourage you to participate in extracurricular activities.

Table 17: *Count and percentage values of the response for question-17 of the questionnaire.*

Options	0 – Strongly disagree	1 – Disagree	2 – Neutral	3 – Agree	4 – Strongly agree
No. of responses	3	10	38	150	130
Percentage of responses	0.9 %	3.0 %	11.5 %	45.3 %	39.3 %

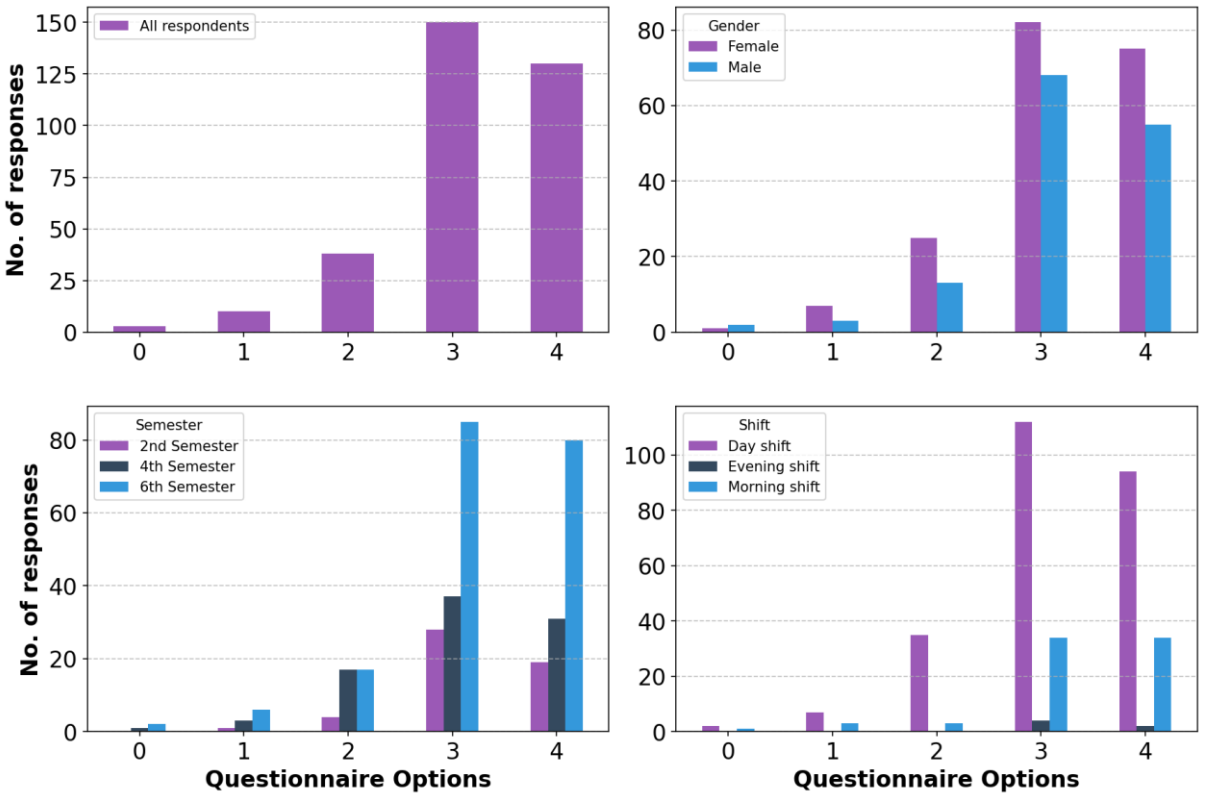


Figure 17: *Bar charts of the percentage of response obtained for various options for question-17 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q18. Efforts are made by the institute/ teachers to inculcate soft skills, life skills and employability skills to make you ready for the world of work.

Table 18: *Count and percentage values of the response for question-18 of the questionnaire.*

Options	0 – Not at all	1 – Very little	2 – Some what	3 – Moderate	4 – To a great extent
No. of responses	8	24	52	119	128
Percentage of responses	2.4 %	7.3 %	15.7 %	36.0 %	38.7 %

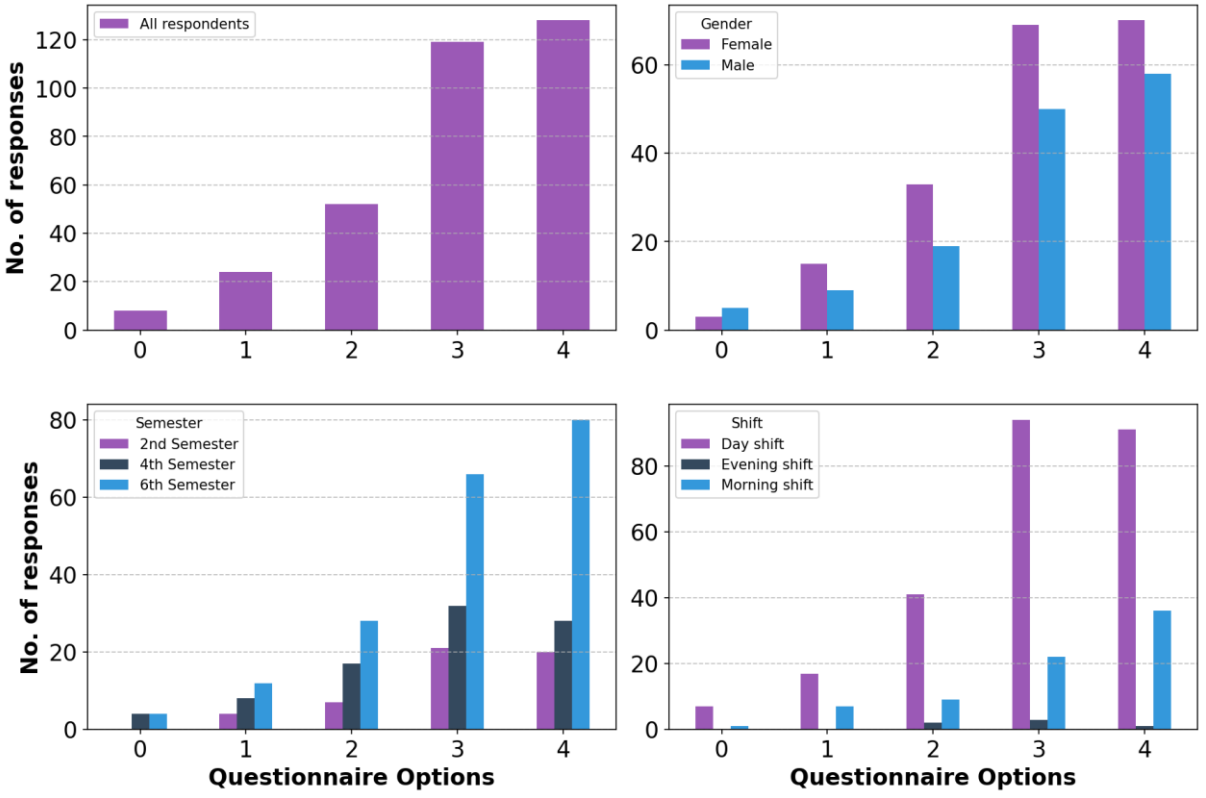


Figure 18: *Bar charts of the percentage of response obtained for various options for question-18 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q19. What percentage of teachers use ICT tools such as LCD projector, Multimedia, etc. while teaching.

Table 19: *Count and percentage values of the response for question-19 of the questionnaire.*

Options	0 – Below 29%	1 – 30 – 49%	2 – 50 – 69%	3 – 70 – 89%	4 – Above 90%
No. of responses	18	25	71	127	90
Percentage of responses	5.4 %	7.6 %	21.5 %	38.4 %	27.2 %

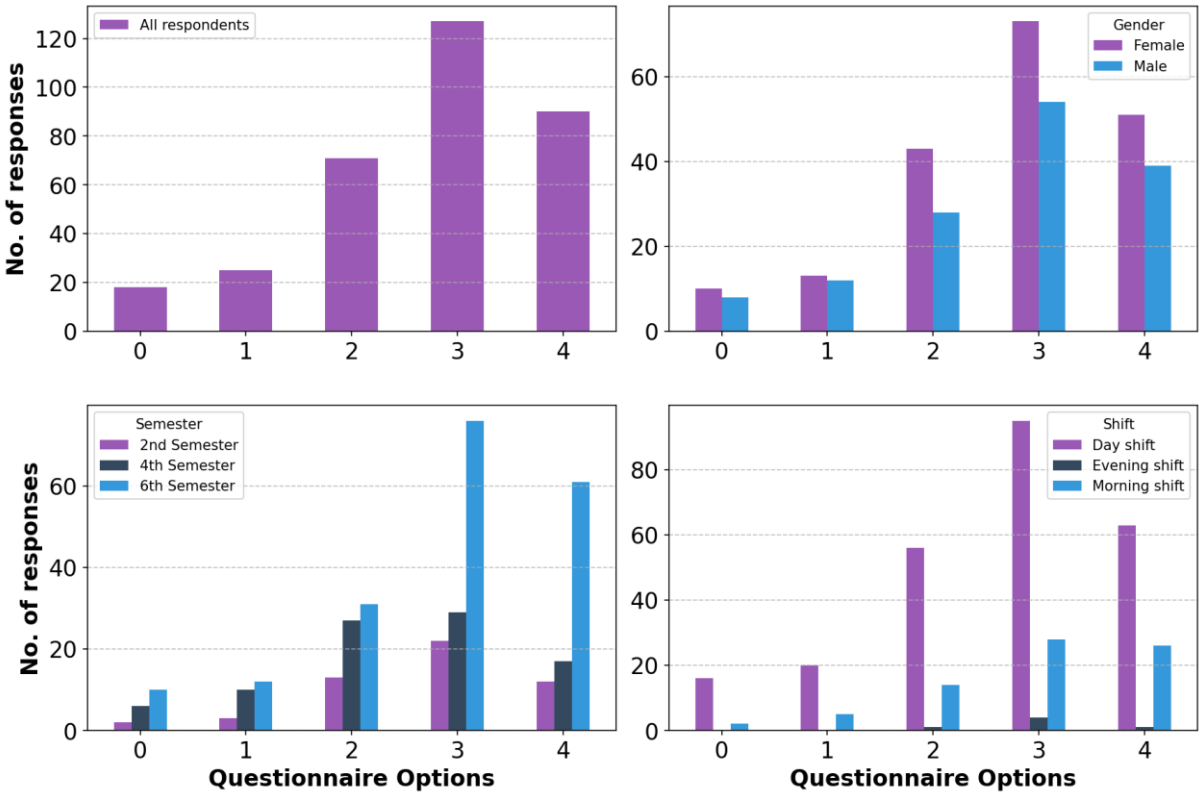


Figure 19: *Bar charts of the percentage of response obtained for various options for question-19 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Q20. The overall quality of teaching-learning process in your institute is very good.

Table 20: *Count and percentage values of the response for question-20 of the questionnaire.*

Options	0 – Strongly disagree	1 – Disagree	2 – Neutral	3 – Agree	4 –Strongly agree
No. of responses	3	4	42	166	116
Percentage of responses	0.9 %	1.2 %	12.7 %	50.2 %	35.0 %

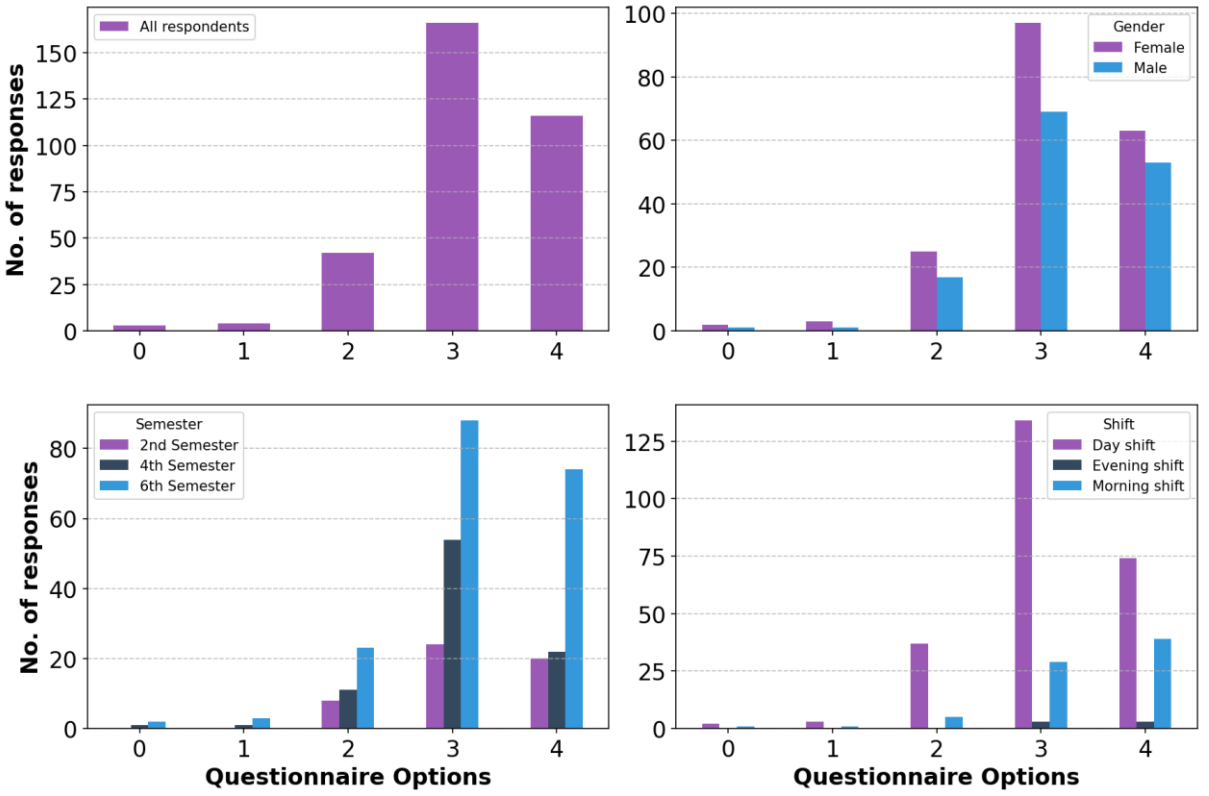


Figure 20: *Bar charts of the percentage of response obtained for various options for question-20 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

Option-wise total response

To summarize the results shown previously, we give below the total number of responses received for each satisfaction level/option, represented by its corresponding numeric value.

Table 21: *The total number of responses obtained for each satisfaction level (numeric value of the options displayed).*

Options	0	1	2	3	4
No. of responses	199	318	1143	2609	2351
Percentage of responses	3.0 %	4.8 %	17.3 %	39.4 %	35.5 %

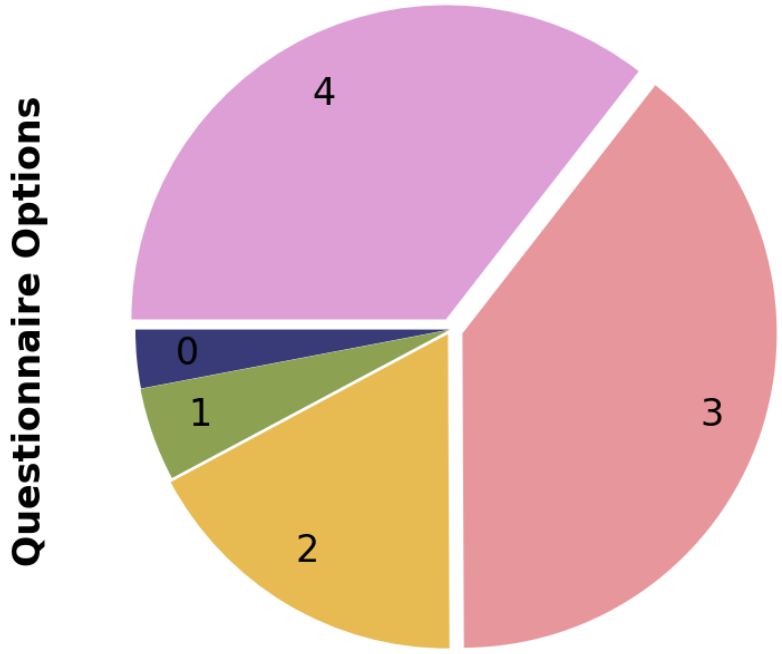


Figure 21: *Pie plot of the total number of responses obtained for each satisfaction level (numeric value of the options displayed).*

The data in previous table (table 21 and figure 21) shows that the respondents have overwhelmingly chosen the higher satisfaction options: the total number of responses for the two of the highest satisfaction level (3 & 4) is 4960 compared to 517 — the total number of responses for the lowest two satisfaction levels (0 & 1). In other words, students are roughly 10 times more likely to be satisfied than dissatisfied.

SUMMARY STATISTICS AND OVERVIEW

In the preceding chapter, we performed a quantitative analysis of the responses obtained for each question and examined the distribution of the responses across different categories, namely, gender, semester and shift. Our aim in this section is to synthesize and identify patterns from the data. These patterns are expected to provide context and elaborate the single value used as the student satisfaction score.

Satisfaction score for the survey 2023-24

As has been stated in the 'Introduction' chapter, NAAC uses the overall mean value obtained in the SSS survey as the key indicator. We show below the SSS score and also two other important descriptive measures that describe different facets of the survey data.

Total satisfaction score obtained for SSS 2022-23: 3.00

Cronbach's alpha of the survey: 0.935

Standard deviation of the satisfaction scores: 0.72

As we can see, the satisfaction score tilts towards the higher rating side (above the mean/median value of 2). The Cronbach's alpha is also high (it can only range between 0 and 1) suggesting that there has been consistency in the way students have recorded their responses. Typically, a Cronbach's alpha value of 0.8 is considered good, and our value is higher indicating very high consistency. The overall standard deviation is low (lower than predicted by the range rule, given that the range of the values is 4) suggesting that the total scores are not scattered widely.

Distribution and Histogram of scores

To substantiate the claims made in the previous section based on the set of single values derived from the survey, we shall now look at the distribution of individual scores plotted in the graph below.

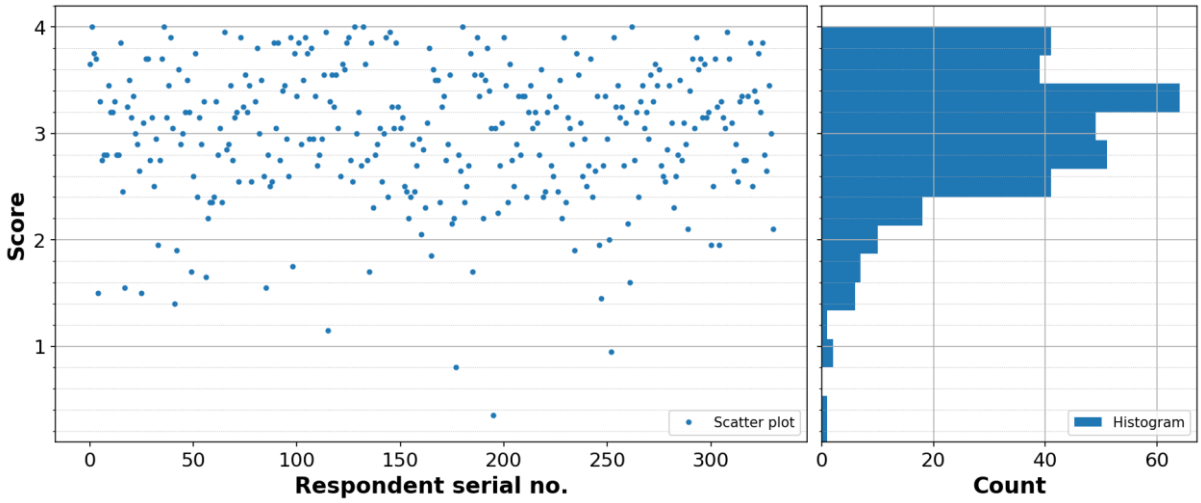


Figure 22: *Graphs showing the distribution of scores. The graph on the left is a scatter plot of respondent vs scores; the graph on the right is a histogram (with 15 bins) of the distribution of scores among respondents.*

We see a notable concentration of values approximately between 2 and 4 and some values below 2; this serves to visually corroborate the calculated value of the overall SSS score of 3.00 obtained in the previous section. The concentration of values also justifies our claim of relatively low variability of the total scores.

We next analyse the variability of scores assigned by students by looking at the distribution of the standard deviation of individual respondents/students among the 20 multiple-choice questions rated by them. Note that the standard deviation obtained in the previous section was calculated on the total score of an individual student, whereas, in this section we are looking at the variability of responses within the 20 questions rated by individual students. This will serve to better explain the Cronbach's alpha rather than the total standard deviation obtained in the previous section.

Figure (23) shows a roughly normal distribution centred around 0.7. Interpreting this finding is intricate due to the non-normal distribution of the scores themselves. However, we can tentatively take it to suggest that the variation of scores is low (roughly equivalent to a variation of 2 points occurring only about 3 times in 20 questions; for example, a score of 2 thrice and 4 seventeen times gives a standard deviation of 0.71).

The standard deviation of only the scores is 1.00 and the mean of the standard deviation of individual respondents' scores is 0.72. This perceptible difference in the numbers indicated that different respondents may have slightly differing

general perceptions (generating higher standard deviation), but responses by individual respondents are highly consistent (generating lower mean of standard deviations).

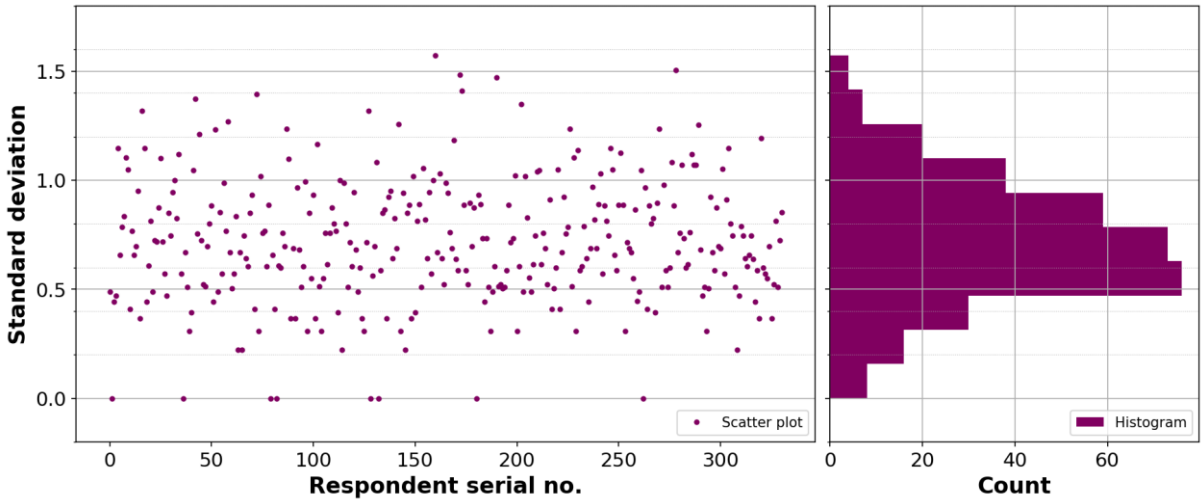


Figure 23: *Graphs showing the distribution of standard deviations. The graph on the left is a scatter plot of respondent vs standard deviation; the graph on the right is a histogram (with 10 bins) of the distribution of standard deviation among respondents.*

RESPONDENT SCORES GROUPED BY VARIOUS DEMOGRAPHICS

We will now try to look at the scores by sorting the respondents into various demographics/categories to visually check if any clear overall pattern exists in the data based on such groupings. In that journey of discovery, we shall first take the help of a grouped-bar graph of scores (given below) that is grouped first by semester followed by gender and shift.

A quick glance on the bar graph below (figure 24) will definitely not yield any strong patterns in the data set when arranged by Shift, Gender and Semester. This lack of visible patterns is probably an artifact of the missing data (the gaps in the graphs).

When arranged by Shift, we find that the Day shift has a mean score of 2.94 (with 250 respondents); mean score of Evening shift is 3.07 (with 6 respondents) and mean score for Morning shift is 3.18 (with 75 respondents). The significant difference in the number of respondents in the various shifts cautions against attaching any significance to any extracted pattern.

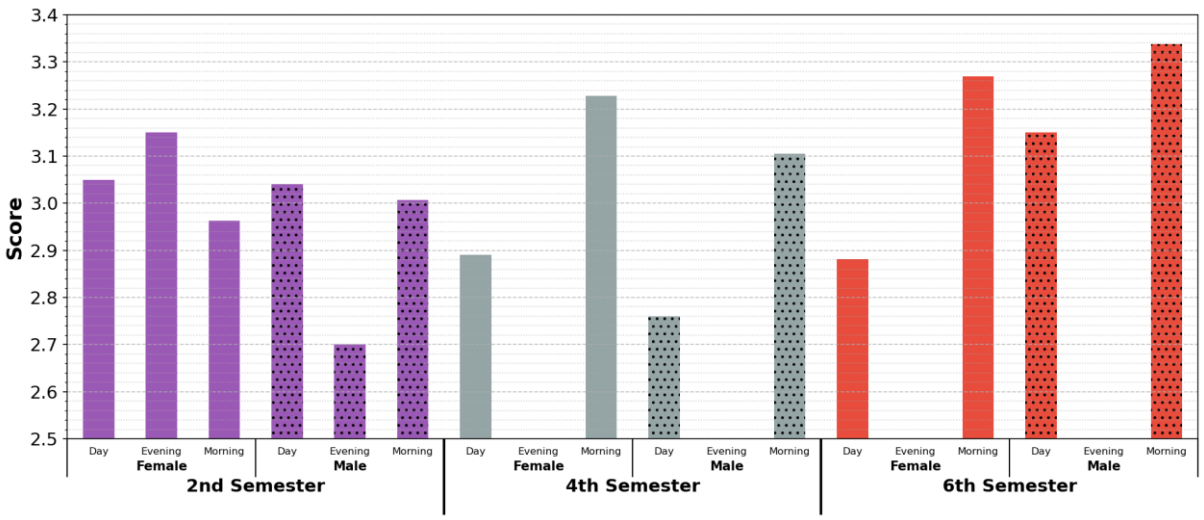


Figure 24: *Bar plot showing average scores per category (Semester, Gender and Shift).*

When arranged by Gender, we find that the male respondents have a mean score of 3.06 (with 141 respondents) while mean score of female respondents is 2.95 (with 190 respondents). In this case, we can say (due to comparable number of

respondents) that male respondents have given higher scores compared to female respondents.

Intra-category comparison

To delve a little deeper into the findings from the previous section, we will now look at the plot of the difference between categories.

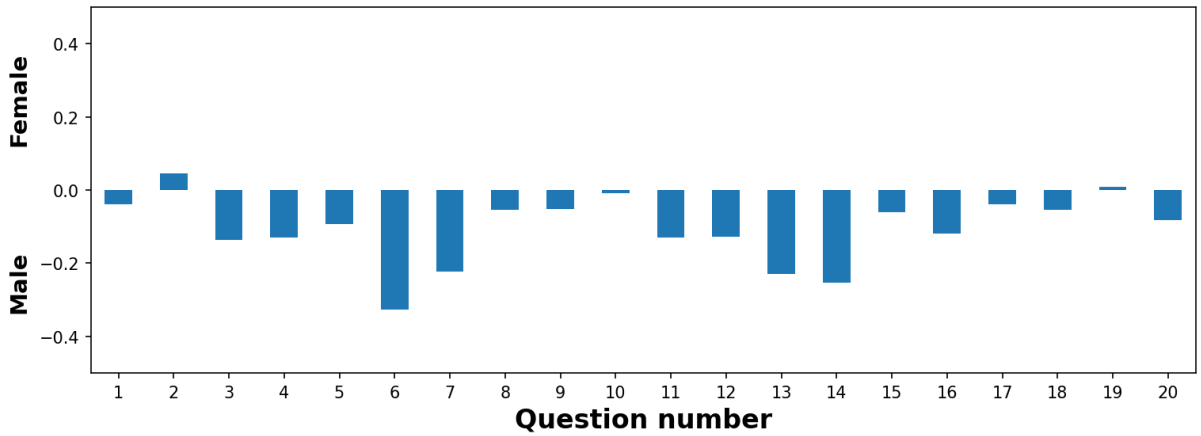


Figure 25: *Difference in the score according to gender.*

Figure (25) shows the plot of scores difference by gender. We find that the scores are almost exclusively skewed towards the male demographic i.e., the male category has consistently rated higher than the female category for most questions.

Table 22: *Gender-wise summary statistics*

Gender	No. of respondents	Mean	Minimum	Maximum	Standard deviation
Female	190	2.95	0.35	4	0.66
Male	141	3.06	0	4	0.63

Table (22) shows the gender-wise summary statistics. The average scores of males are higher by 0.11.

Next, we will look at the difference in the scores according to Shift.

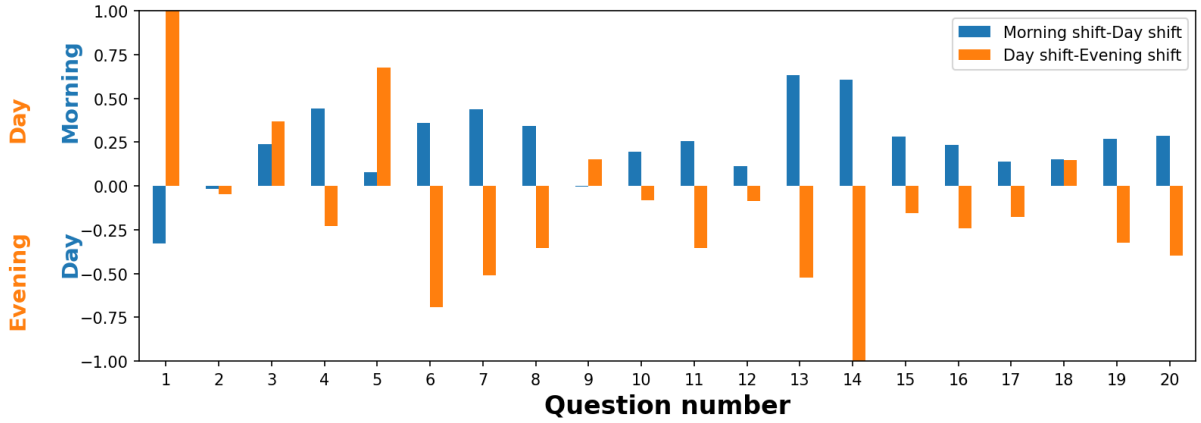


Figure 26: Difference in the score according to shift.

Figure (26) shows the plot of scores difference by shift. We refrain from drawing conclusions from this graph due to discrepancy in the number of respondents as can be seen from table (23).

Table 23: Shift-wise summary statistics

Shift	No. of respondents	Mean	Minimum	Maximum	Standard deviation
Day shift	250	2.94	0	4	0.67
Evening shift	6	3.07	2.70	3.25	0.20
Morning shift	75	3.18	1.90	4	0.55

Next, we will look at the difference in the scores according to Semester.

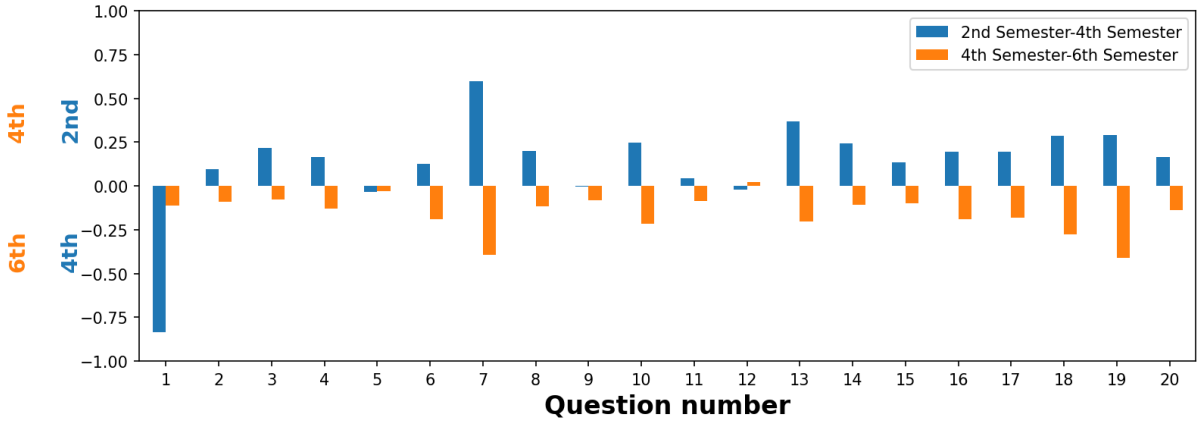


Figure 27: Difference in the score according to Semester.

Figure (27) shows the plot of scores difference by semester. Herein too there is a significant discrepancy in the number of respondents as can be seen from table (24). However, we would like to point out the high scores given by the 6th Semester, despite being the largest demographic.

***Table 24:** Semester-wise summary statistics*

Semester	No. of respondents	Mean	Minimum	Maximum	Standard deviation
2nd Semester	52	3.02	1.90	3.90	0.47
4th Semester	89	2.89	0	4	0.69
6th Semester	190	3.04	0.35	4	0.67

ANOVA

To have a relook at the patterns within various categorizations, we employ an analysis of variance (ANOVA) approach; this methodology has been approved by many scientists (Norman, 2010).

The p-value of the one-way ANOVA for Gender is 0.15. Null hypothesis that the population means are equal is accepted at 95% confidence (p-value > 0.05), while the alternative hypothesis that at least one mean is different is rejected. This is indeed an interesting result. We had observed earlier that there was a difference of 0.11 between the male and female demographics, the ANOVA seems imply that the difference is not statistically significant.

The p-value of the one-way ANOVA for Shift is 0.021. Null hypothesis that the population means are equal is rejected at 95% confidence (p-value < 0.05), while the alternative hypothesis that at least one mean is different is accepted. We had refrained from drawing conclusions due to notably varying number of respondents in each demographic of shift categorization, the results of ANOVA are known to be affected by the same consideration, hence, we disregard this result.

The p-value of the one-way ANOVA for Semester is 0.17. Null hypothesis that the population means are equal is accepted at 95% confidence (p-value > 0.05), while the alternative hypothesis that at least one mean is different is rejected. Herein

too we disregard the ANOVA result due to significant difference in the number of respondents in the different demographics.

Identifying critical questions

In this section, we examine the survey with a focus on questions that received varying levels of favourability.

Significant questions per individual response level

First, we analyse each option (ranging from 0 to 4) and identify the top five questions with the highest number of responses. These results are presented in tabular form across tables (25) to (29).

By examining the lowest levels from tables (25) and (26), we can identify the five questions that were unfavourably received. Notably, questions 7 and 14 prominently appear in the lowest two options, suggesting that they require further attention.

Similarly, by considering the highest levels from tables (28) and (29), we identify the five questions that were very favourably received by the students. Questions 2, 15, 3 and 1 performed exceptionally well. In terms of scores (table 30), questions 2, 3 and 1 also performed better.

Table 25: *Five questions with the highest number of responses for option with numeric value '0' from among the choices.*

No. of responses	40	28	18	17	13
Question no.	**7**	**14**	**19**	**6**	**13**

Table 26: *Five questions with the highest number of responses for option with numeric value '1' from among the choices.*

No. of responses	38	31	26	25	24
Question no.	**14**	**7**	**16**	**19**	**13**

Table 27: *Five questions with the highest number of responses for option with numeric value '2' from among the choices.*

No. of responses	106	93	79	77	74
Question no.	**6**	**7**	**8**	**11**	**4**

Table 28: *Five questions with the highest number of responses for option with numeric value '3' from among the choices.*

No. of responses	183	174	170	166	163
Question no.	**2**	**15**	**8**	**20**	**9**

Table 29: *Five questions with the highest number of responses for option with numeric value '4' from among the choices.*

No. of responses	170	169	164	144	133
Question no.	**3**	**1**	**12**	**10**	**5**

Score and variability of individual questions

To summarize the results from the previous tabulations, we compute and present the total score for each of the 20 MCQs, ordered by their respective scores, in the following table. Standard deviation of the scores is also given along with the score values to indicate the variability. Examining this aggregated view offers valuable insights into the contributions that lead to the overall survey satisfaction score.

Table 30: *Total satisfaction score and standard deviation for each multiple-choice questions asked in the questionnaire (arranged in descending order).*

Question asked	Score	Standard Deviation
2. How well did the teachers prepare for the classes?	3.28	0.70
12. The teachers illustrate the concepts through examples and applications.	3.27	0.88
3. How well were the teachers able to communicate?	3.25	0.92
1. How much of the syllabus was covered in the class?	3.25	0.97

17. Teachers encourage you to participate in extracurricular activities.	3.19	0.82
5. Fairness of the internal evaluation process by the teachers.	3.18	0.83
20. The overall quality of teaching-learning process in your institute is very good.	3.17	0.76
9. The institution provides multiple opportunities to learn and grow.	3.15	0.79
10. Teachers inform you about your expected competencies, course outcomes and programme outcomes.	3.13	0.95
15. The institution makes effort to engage students in the monitoring, review and continuous quality improvement of the teaching learning process.	3.08	0.80
18. Efforts are made by the institute/ teachers to inculcate soft skills, life skills and employability skills to make you ready for the world of work.	3.01	1.03
16. The institute/ teachers use student centric methods, such as experiential learning, participative learning and problem solving methodologies for enhancing learning experiences.	2.98	0.99
13. The teachers identify your strengths and encourage you with providing right level of challenges	2.96	1.09
4. The teacher's approach to teaching can best be described as	2.88	0.90
11. Your mentor does a necessary follow-up with an assigned task to you.	2.88	0.98
19. What percentage of teachers use ICT tools such as LCD projector, Multimedia, etc. while teaching.	2.74	1.10
6. Was your performance in assignments discussed with you?	2.73	1.09

8. The teaching and mentoring process in your institution facilitates you in cognitive, social and emotional growth.	2.73	0.92
14. Teachers are able to identify your weaknesses and help you to overcome them.	2.63	1.28
7. The institute takes active interest in promoting internship, student exchange, field visit opportunities for students.	2.43	1.30

ANALYSIS OF THE RESPONSES TO THE OPEN-ENDED QUESTION

The analysis of the open-ended questions presents a unique blend of simplicity and complexity. Subjectively, it seems straightforward to dissect these responses. However, objectively analysing them becomes intricate due to the inherent limitations of natural language processing (NLP). In our analysis, we have tried to incorporate both subjective and objective aspects. The visualization technique we have used is called a word-cloud or tag-cloud, where the size of the font of a particular word/phrase represents its relative importance.

Basic word-cloud based on frequency of words

First, we plot a word-cloud based simply on the frequency of words. This is generated using the `wordcloud` package of Python programming language. However, there is sparse documentation into the exact methodology of extraction used by this package. The generated word-cloud is shown in figure (28).

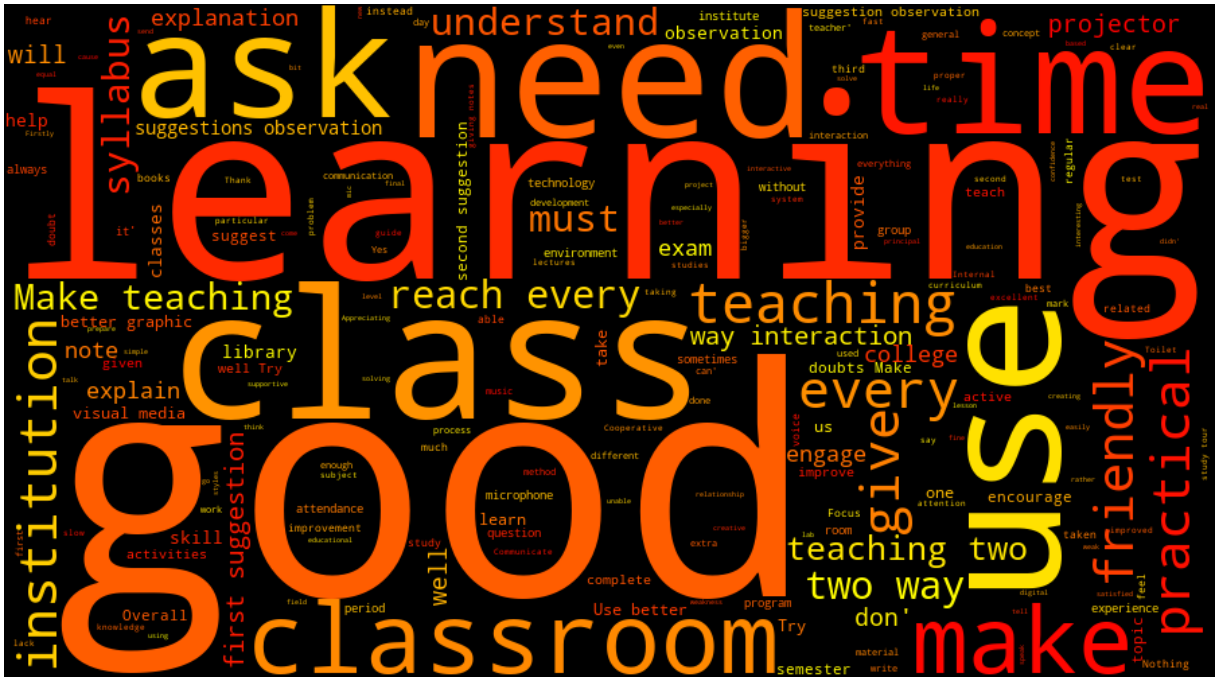


Figure 28: *Word-cloud using frequency and co-occurrence.*

As expected, not much insight is gained from such a word-cloud, only generic words liable to be used in such surveys. Apart from common words, the only relevant terms seem to be 'visual media' and 'projector'.

Word-cloud based on NLP using Rake

As explained in the 'Introduction' chapter, we have used the RAKE algorithm to extract key words from the response data. The word-cloud shown in figure (29) is based on the rank scores assigned to phrases.

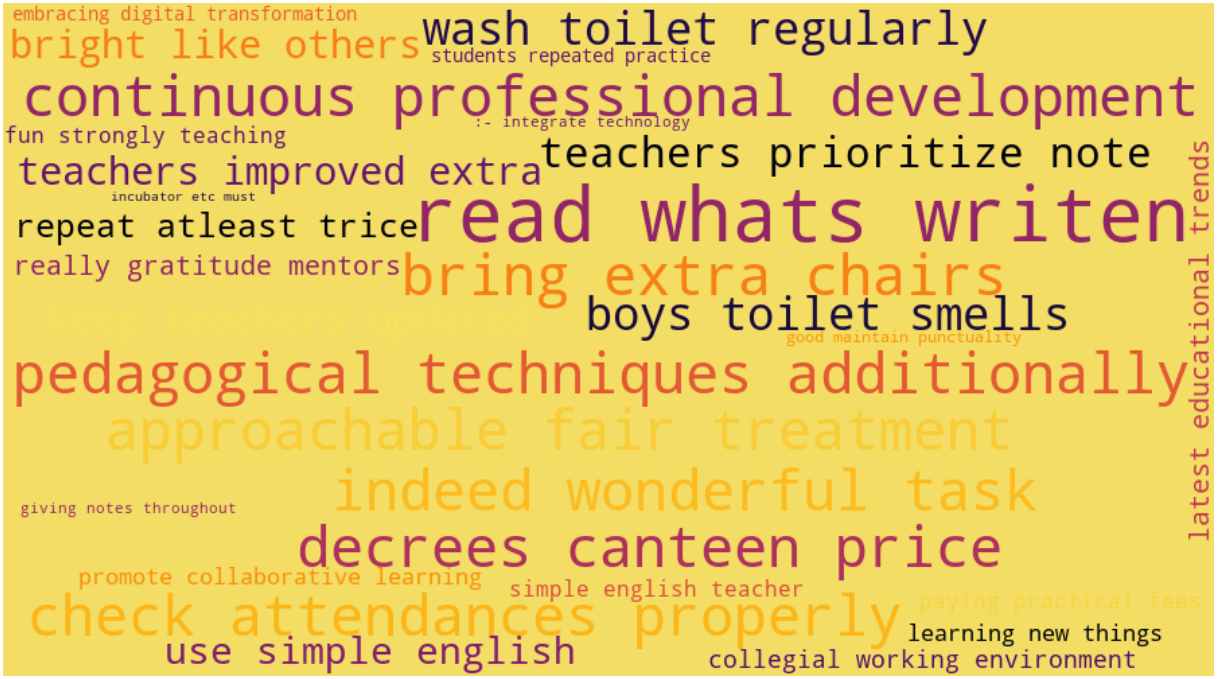


***Figure 29:** Word-cloud using RAKE-NLTK.*

CONCLUSION AND RECOMMENDATIONS

The Student Satisfaction Survey 2023-24 has provided crucial insights into student experiences and can serve as an important bridge between the student body and the administration/faculty and facilitate open communication between the stakeholders. Although, the results presented in the previous chapters were accompanied by discussions on their implications, nevertheless, we would like to collate and summarize the findings of the entire survey in this short chapter.

The final satisfaction score/key indicator – the overall measure of satisfaction was calculated to be 3.00. This value is marginally below our target level of 3.2. This serves to remind us to increase our efforts to improve the student satisfaction levels. We need to work to make positive progress towards enhancing student experiences by diagnosing shortcomings and upgrading/supplementing existing facilities.

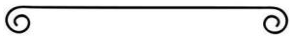
The target of 3.2 was arrived at through the following considerations: We assumed that the minimum acceptable score would be one in which 90% of students are equally split between the highest two satisfaction scores viz. 3 and 4 (with a mean of 3.5) and the remaining 10% are equally split among the rest of the scores (between 0 and 2, with a mean of 0.5). The average score for such a situation comes to 3.2 ($0.9 \times 3.5 + 0.1 \times 0.5$).

Dissecting the results from the perspectives of the various demographic categorizations, it was found that the female demographic has consistently scored lower than the male demographic for all 20 MCQs (figure 25 and table 22). The five highest difference was noted for questions 6, 14 ,13, 7 and 3. *Further surveys and focused discussions should be conducted to understand the underlying reasons and identify areas where the institution can address specific concerns faced by female students.*

Due to significant difference in the number of respondents, we refrain from drawing conclusions from data grouped by shift and semester.

Based on the analysis of the open-ended question, we find that the students require revision of their class discussion/notes. This was expected due to the fact in attempting to align the NEP schedule with the regular schedule, less time was obtained for even semesters. We also recommend that measures be taken to keep toilets clean despite continual usage. Since, most of the faculty are multi-lingual, they can be encouraged to use a mixed medium of instruction.

Apart from SSS, we will need to use other means to identify and address the evolving needs and expectations of the student, particularly so in the light of the implementation of NEP.



APPENDIX: CODE FOR CRONBACH'S α

```python
def cronbach_alpha(df):
    # df is pandas DataFrame.
    # the rows of df are samples (respondents),
    # the columns of df are items (questions).

    # correct orientation
    if df.shape[0] > df.shape[1]:
        pass
    else:
        df = df.T

    # convert to integer
    df = df.astype('int64')

    # number of data points
    num_items = df.shape[1]
    # average covariance etc
    s = df.var(axis=0).sum()
    v = df.sum(axis=1).var()
    return num_items/(num_items - 1)*(1 - s/v)
```

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