Report
on
Student Satisfaction Survey
2022-23

Don Bosco College, Tura

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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 2022-23 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 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 calculated as the overall 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 Don Bosco College, Tura. The SSS is a demonstration of our commitment to a sensitive environment where student voices are heard and valued.

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

Dr. Yubaraj Sharma

SSS Coordinator,
Don Bosco College, Tura
Meghalaya

MESSAGE FROM THE PRINCIPAL

As an integral part of our commitment to excellence and continuous improvement, the Student Satisfaction Survey plays a pivotal role in our journey towards academic and institutional enhancement. The SSS is not just a routine assessment but a crucial tool endorsed by the National Assessment and Accreditation Council (NAAC) for gauging student satisfaction levels and understanding their needs and aspirations.

Don Bosco College places immense value on feedback from our students, as it provides us with invaluable insights into various aspects of campus life, academic experiences, infrastructure, support services, and overall satisfaction levels. Through the SSS, we aim to identify areas of strength and areas that require attention, thus paving the way for strategic planning and targeted interventions.

We extend our heartfelt gratitude to Dr. Yubraj Sharma, the SSS Coordinator, and Dr. Barbara S. Sangma, the IQAC Coordinator, for their relentless efforts in spearheading this initiative. We also acknowledge the contributions of all IQAC Criteria Coordinators for their hard work and dedication in making the SSS a success.

The students' participation in the SSS is crucial in shaping the future of Don Bosco College and ensuring that it remains a vibrant hub of learning and growth. These feedbacks will enable us to tailor our academic programs, support services, and infrastructure to better meet the needs and aspirations of our students.

Fr Bivan Rodriques Mukhim SDB

Principal,
Don Bosco College, Tura
Meghalaya

MESSAGE FROM THE IQAC COORDINATOR

Students Satisfaction Survey (SSS) is a healthy introspection aiding and accelerating continued growth of the Institution as a whole. It offers an opportunity to the Teaching faculty to see themselves and their academic activities from the perspective of students. The exercise is also a valid way of throwing challenges to the teaching faculty to come up with appropriate responses to the findings about themselves.

SSS is both individual and general. If executed in a responsible manner it can be a signpost directing the institution and its stakeholders towards progress and growth they aspire to achieve. This is why it is also a test of the sense of responsibility and personal integrity of the stakeholders, which is intrinsic and acquired, one and at the same time.

I am happy that Don Bosco College, Tura has completed SSS for the academic year 2022□'23, which speaks about the College's willingness to grow and give its best to its students. My sincere appreciation to the Principal of the College - Fr. Bivan Rodriques Mukhim, SSS Coordinator - Dr. Yubaraj Sharma, and all the Criterion Coordinators: Mr. Bravewell Mawthoh, Dr. Yubaraj Sharma, Dr. Lilybell Ch, Marak, Dr, Colnat B. Marak, Ms. Westerley R. Marak, Dr. Meuller Beul M. Sangma, and Mr. Andrew B. Sangma for their dedication to the quality assurance of the College. May the Don Bosco College, Tura continue in its pursuit of excellence.

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), 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, therefore presume that the analysis of the SSS is to be done in a similar manner for consistency.

In their guideline[1] for student satisfaction survey, 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 teaching learning process. Questions vary from specific teaching*

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

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 MCQs 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 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 understand 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

[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.

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).
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,

[4] One-way ANOVA for two groups is equivalent to a t-test.
[5] see appendix for the Python code used for calculation of Cronbach's α.

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.
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: 363

Total number of female respondents: 215

Total number of male respondents: 148

Total number of 2nd semester respondents: 123

Total number of 4th semester respondents: 127

Total number of 6th semester respondents: 113

Total number of morning shift respondents: 69

Total number of day shift respondents: 294

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 MCQs, 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 comparison. For additional insights, bar-graphs showing the data segregated by gender, semester and shift are also plotted for each individual question.

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	0	2	12	93	256
Percentage of responses	0.0 %	0.6 %	3.3 %	25.6 %	70.5 %

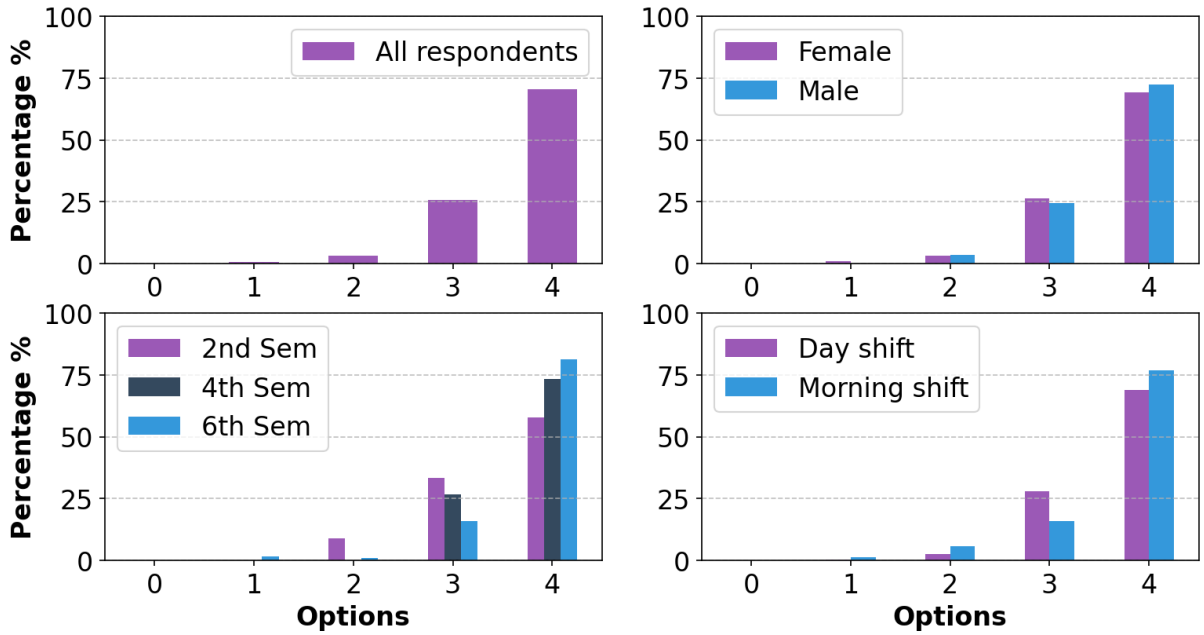

Figure 1: *Bar charts of the percentage of response obtained for various options for question-1 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	0	7	2	201	153
Percentage of responses	0.0 %	1.9 %	0.6 %	55.4 %	42.1 %

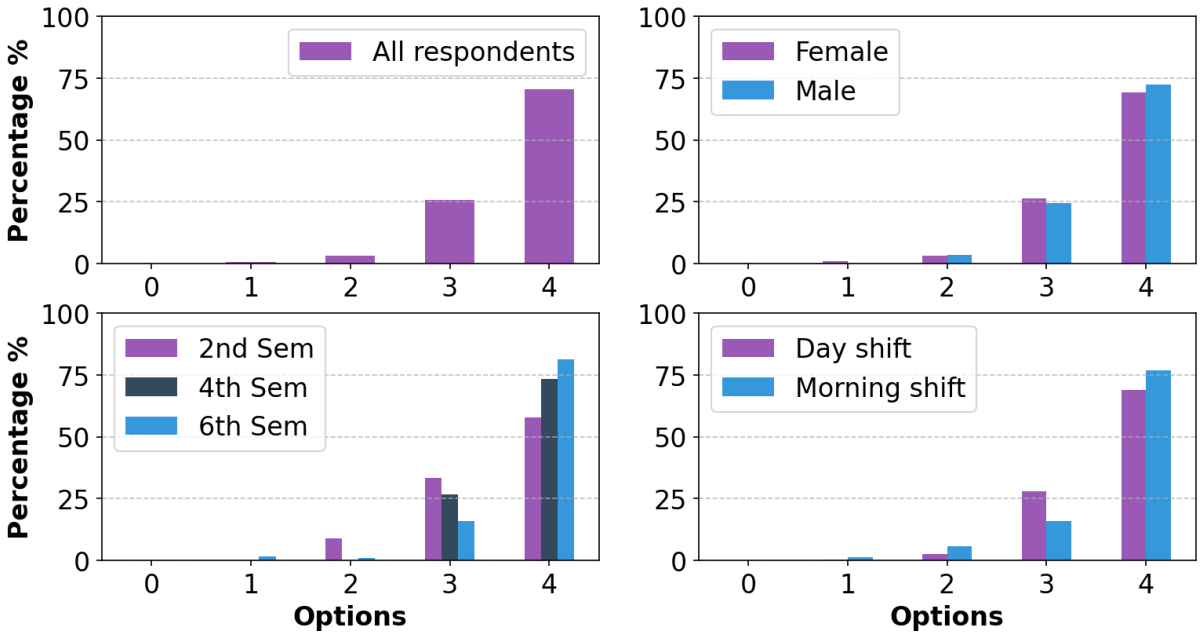

Figure 2: *Bar charts of the percentage of response obtained for various options for question-2 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	3	4	46	104	206
Percentage of responses	0.8 %	1.1 %	12.7 %	28.7 %	56.7 %

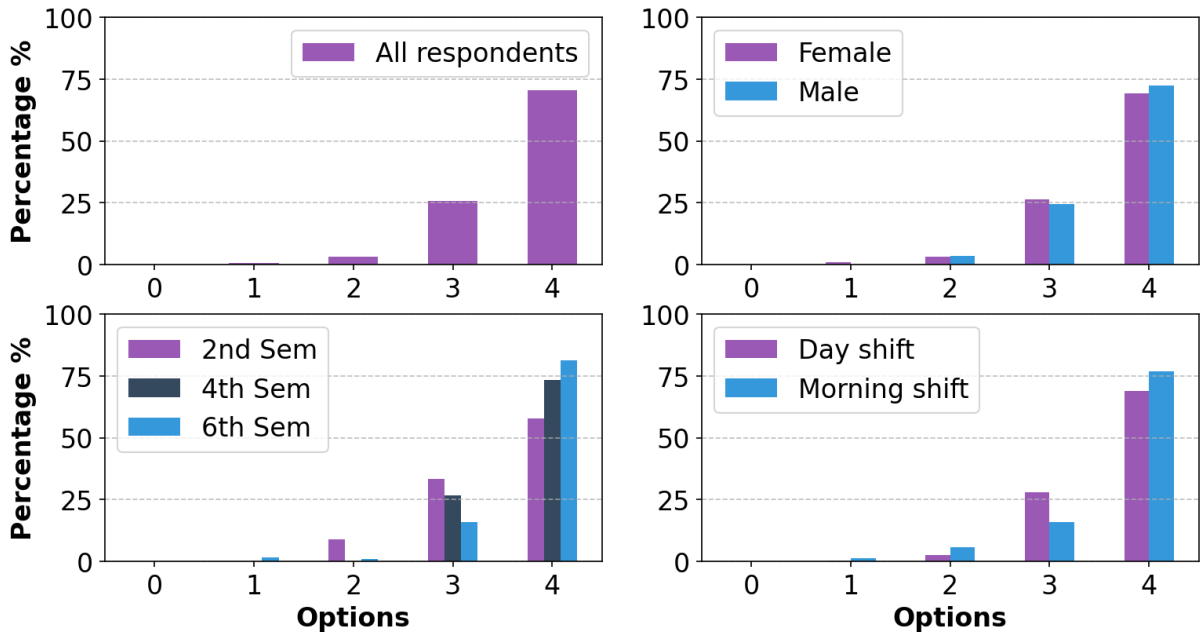

Figure 3: *Bar charts of the percentage of response obtained for various options for question-3 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	1	7	66	158	131
Percentage of responses	0.3 %	1.9 %	18.2 %	43.5 %	36.1 %

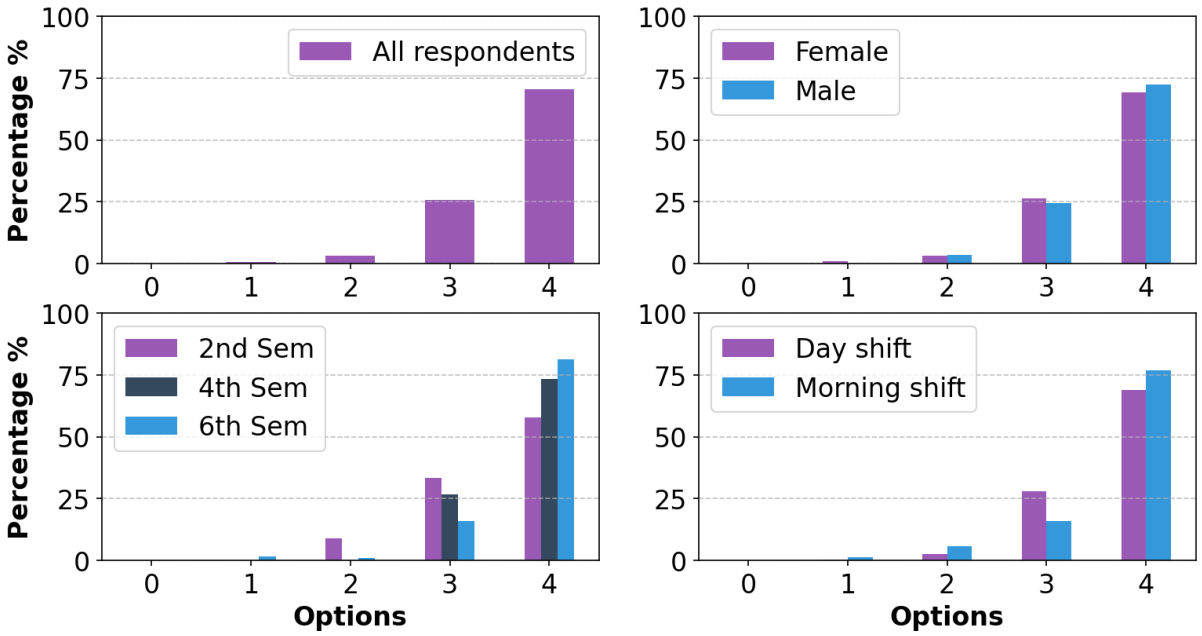

Figure 4: *Bar charts of the percentage of response obtained for various options for question-4 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	1	2	33	136	191
Percentage of responses	0.3 %	0.6 %	9.1 %	37.5 %	52.6 %

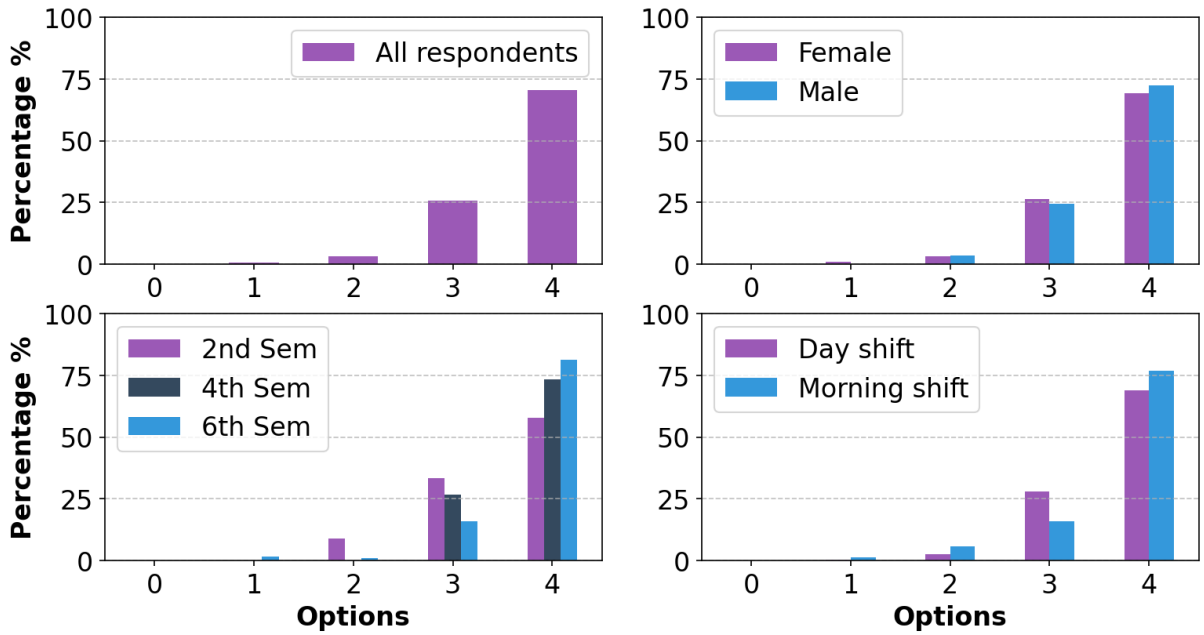

Figure 5: *Bar charts of the percentage of response obtained for various options for question-5 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	11	13	90	108	141
Percentage of responses	3.0 %	3.6 %	24.8 %	29.8 %	38.8 %

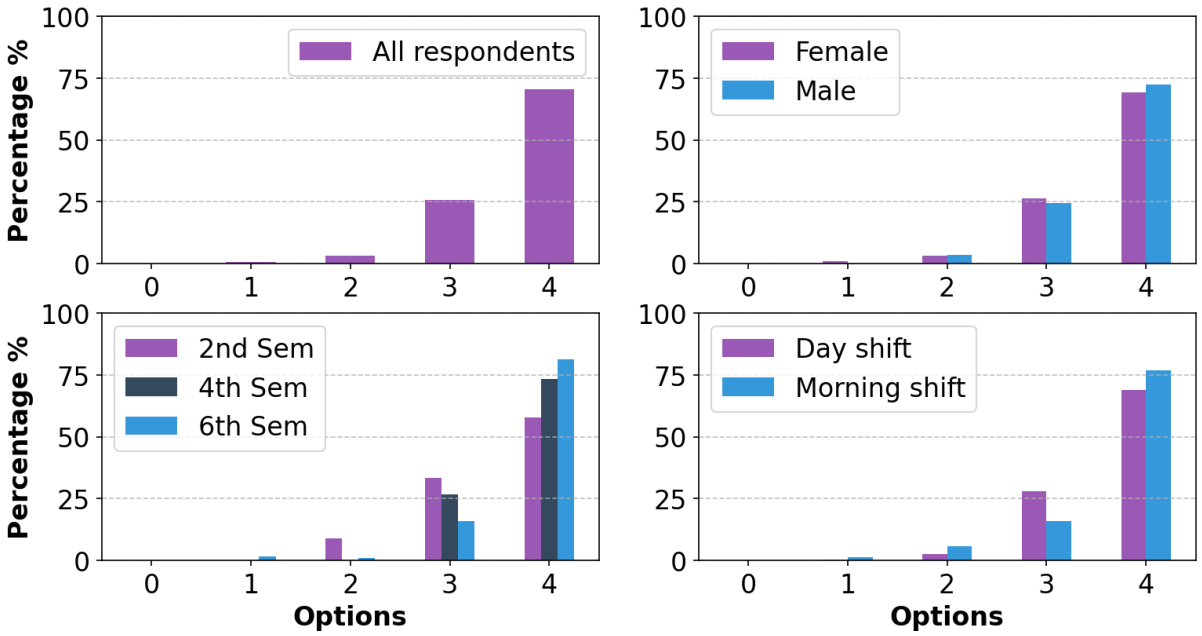

Figure 6: *Bar charts of the percentage of response obtained for various options for question-6 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	33	31	102	94	103
Percentage of responses	9.1 %	8.5 %	28.1 %	25.9 %	28.4 %

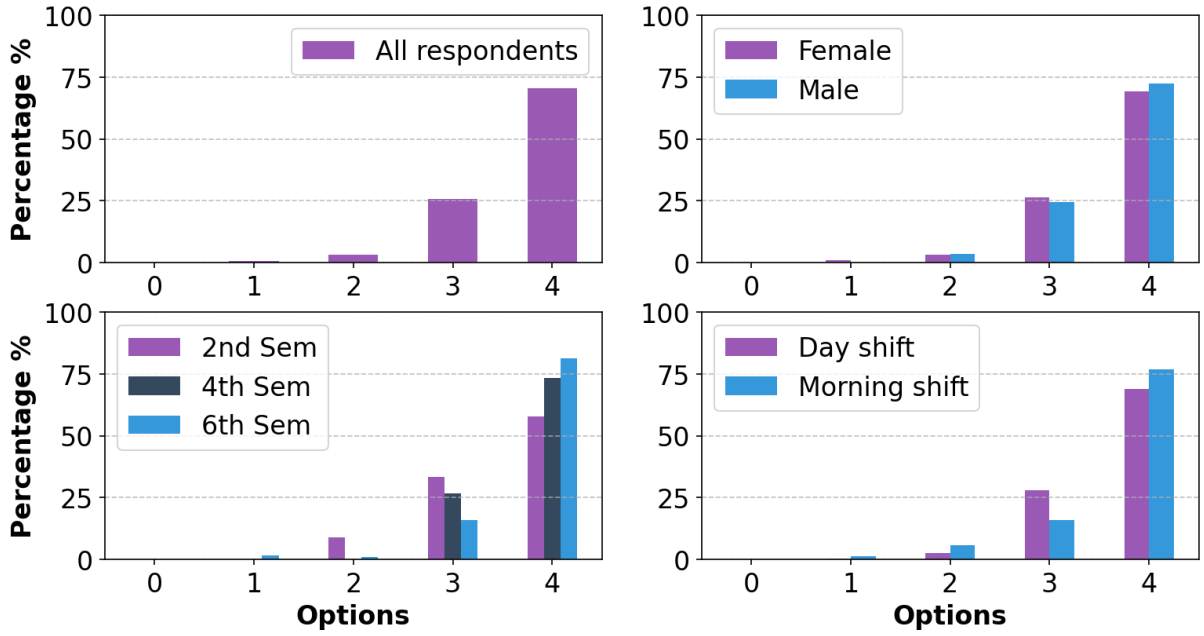

Figure 7: *Bar charts of the percentage of response obtained for various options for question-7 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	5	10	64	189	95
Percentage of responses	1.4 %	2.8 %	17.6 %	52.1 %	26.2 %

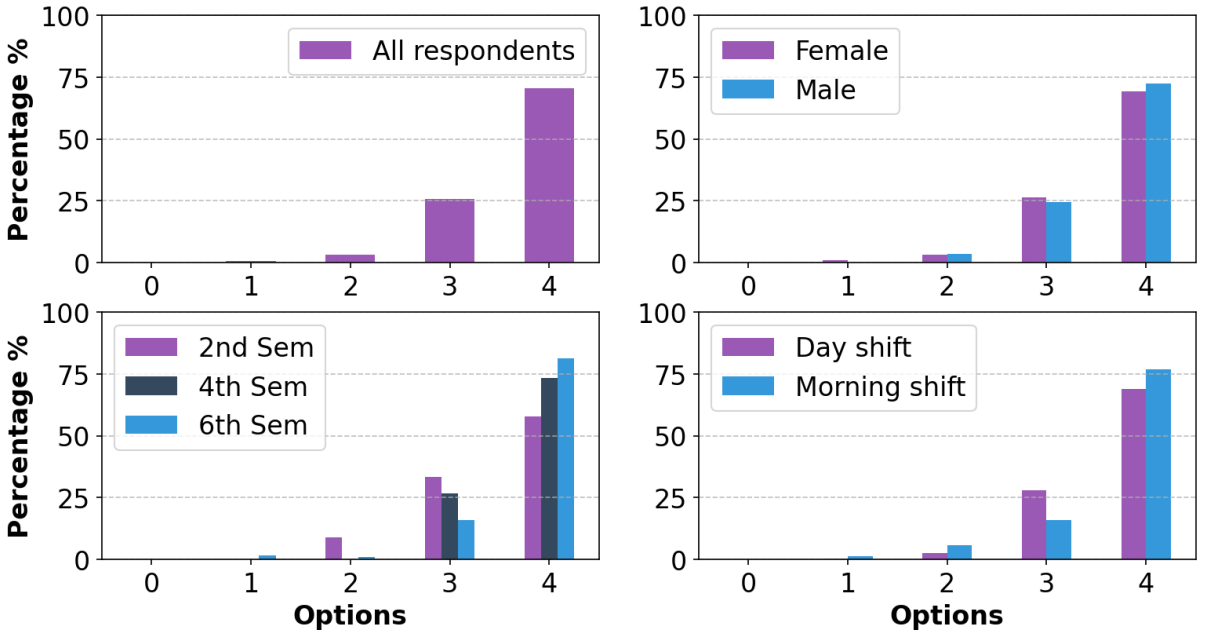

Figure 8: *Bar charts of the percentage of response obtained for various options for question-8 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	0	0	34	181	148
Percentage of responses	0.0 %	0.0 %	9.4 %	49.9 %	40.8 %

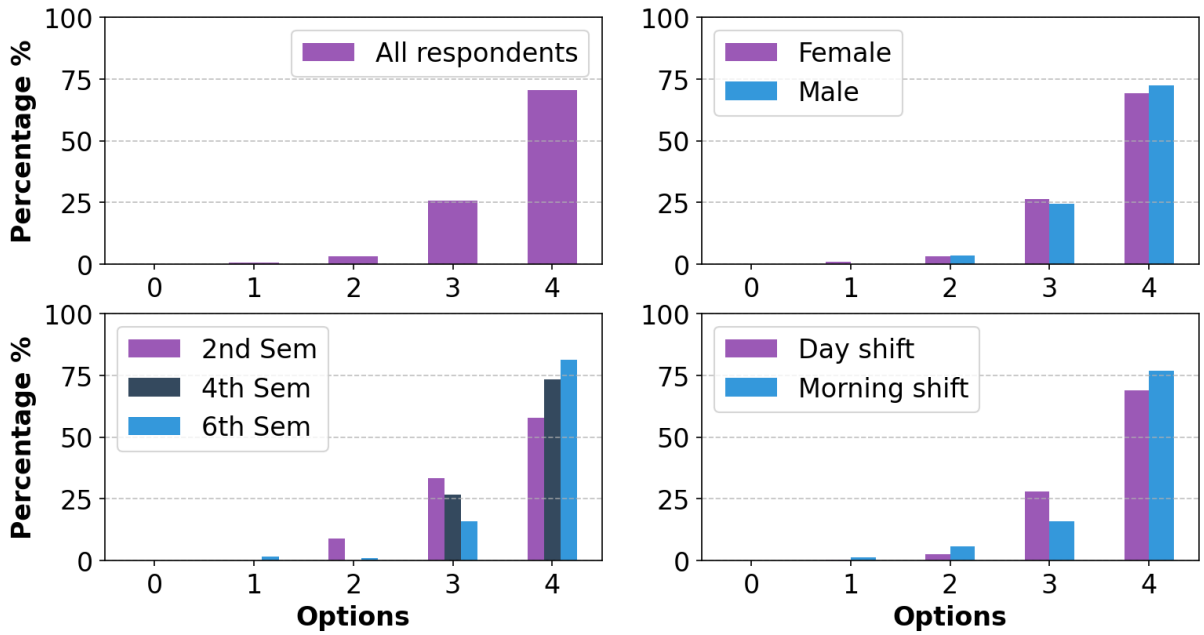

Figure 9: *Bar charts of the percentage of response obtained for various options for question-9 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	1	7	45	113	197
Percentage of responses	0.3 %	1.9 %	12.4 %	31.1 %	54.3 %

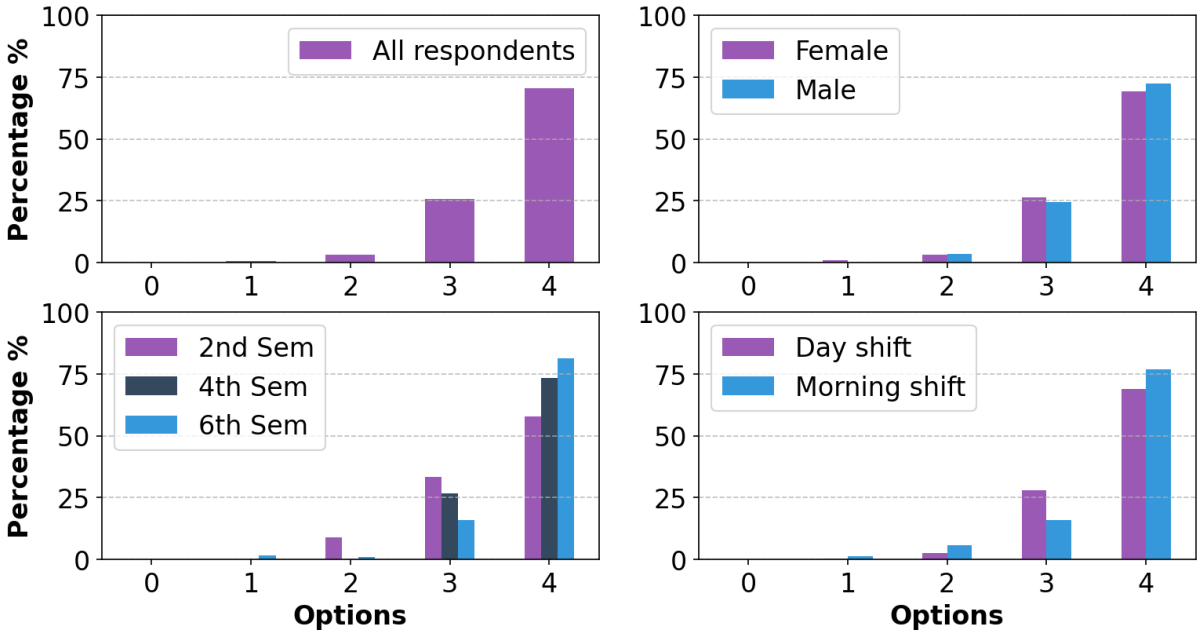

Figure 10: *Bar charts of the percentage of response obtained for various options for question-10 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	3	10	61	137	152
Percentage of responses	0.8 %	2.8 %	16.8 %	37.7 %	41.9 %

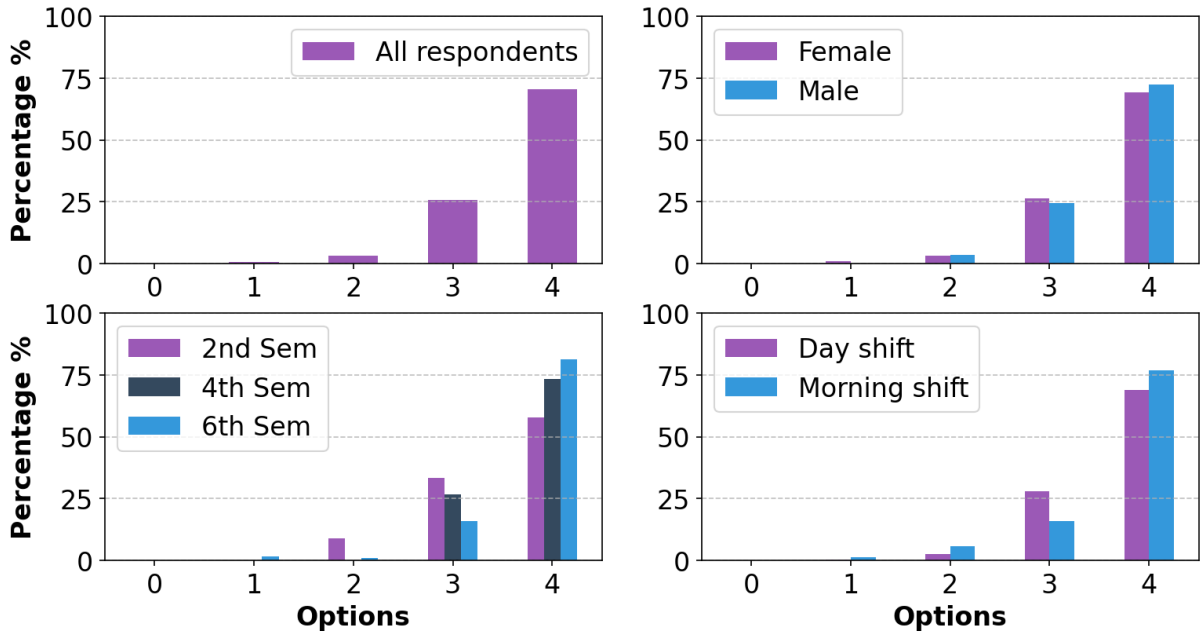

Figure 11: *Bar charts of the percentage of response obtained for various options for question-11 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	0	5	29	119	210
Percentage of responses	0.0 %	1.4 %	8.0 %	32.8 %	57.9 %

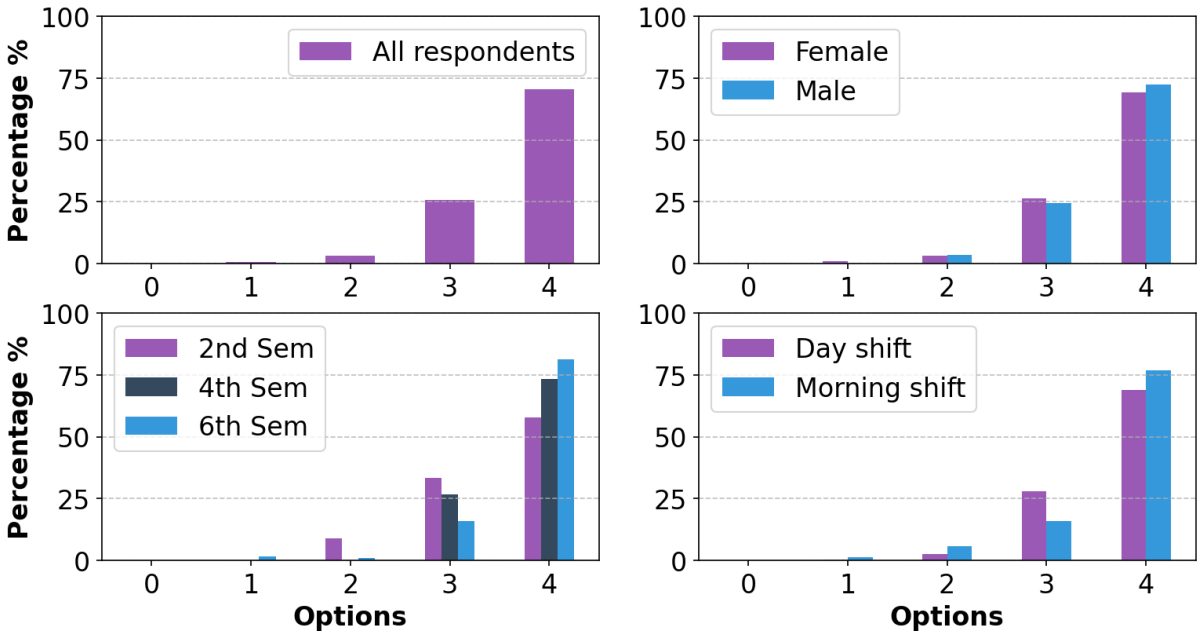

Figure 12: *Bar charts of the percentage of response obtained for various options for question-12 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	6	16	45	133	163
Percentage of responses	1.7 %	4.4 %	12.4 %	36.6 %	44.9 %

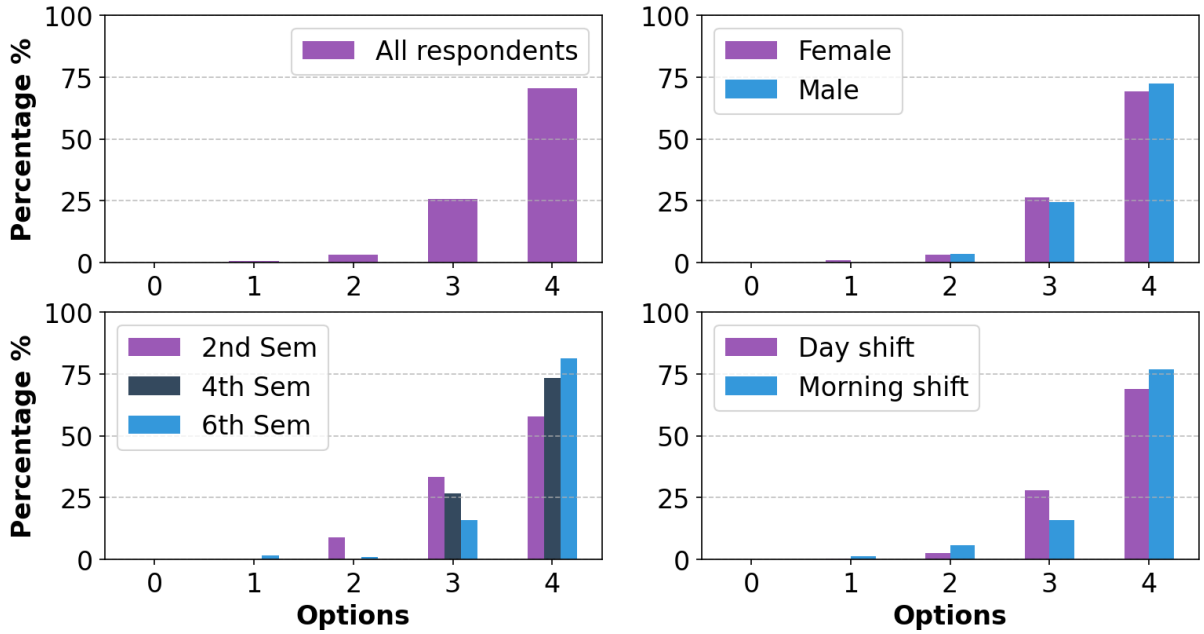

Figure 13: *Bar charts of the percentage of response obtained for various options for question-13 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	13	35	66	114	135
Percentage of responses	3.6 %	9.6 %	18.2 %	31.4 %	37.2 %

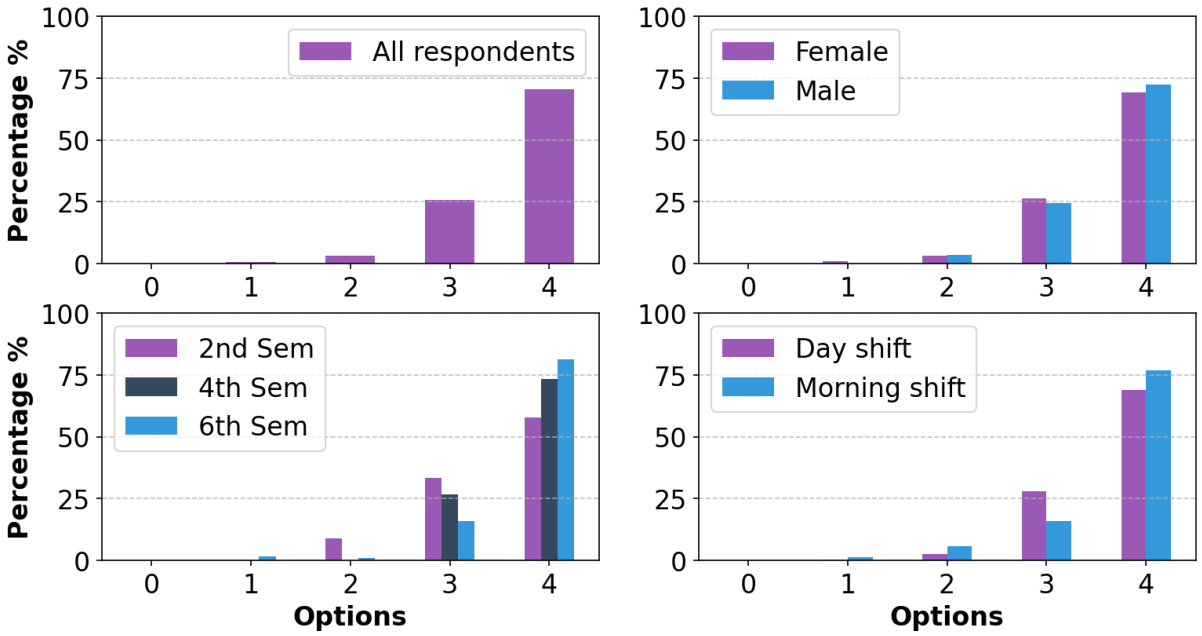

Figure 14: *Bar charts of the percentage of response obtained for various options for question-14 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	0	1	44	187	131
Percentage of responses	0.0 %	0.3 %	12.1 %	51.5 %	36.1 %

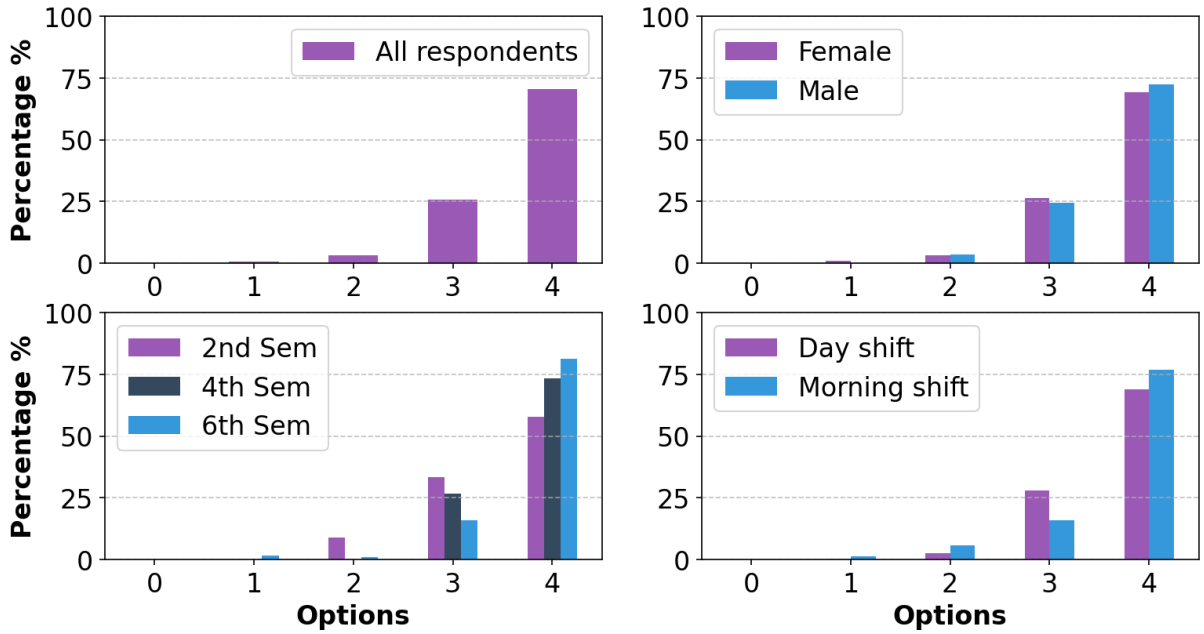

Figure 15: *Bar charts of the percentage of response obtained for various options for question-15 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	3	18	39	158	145
Percentage of responses	0.8 %	5.0 %	10.7 %	43.5 %	39.9 %

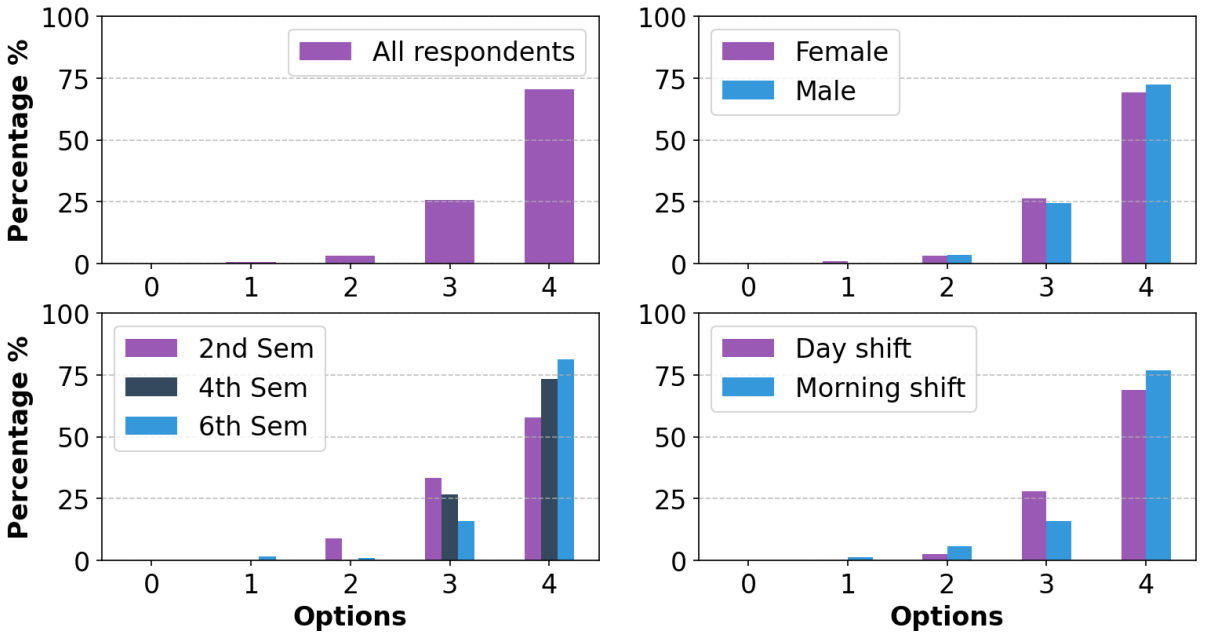

Figure 16: *Bar charts of the percentage of response obtained for various options for question-16 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	1	3	37	150	172
Percentage of responses	0.3 %	0.8 %	10.2 %	41.3 %	47.4 %

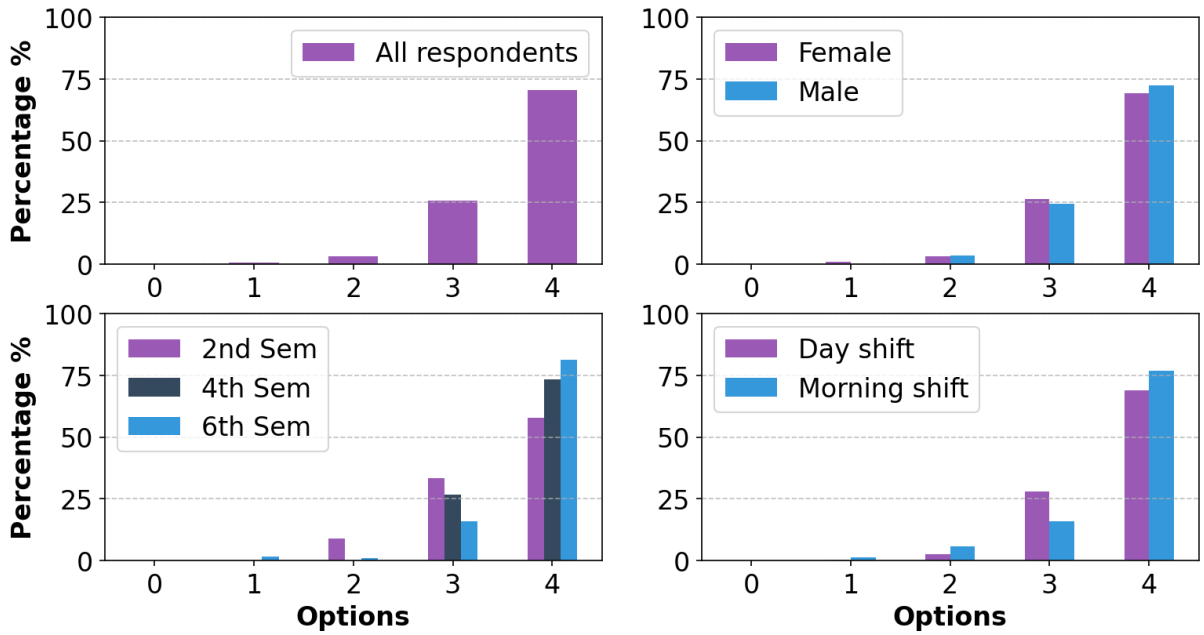

Figure 17: *Bar charts of the percentage of response obtained for various options for question-17 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	5	16	32	138	172
Percentage of responses	1.4 %	4.4 %	8.8 %	38.0 %	47.4 %

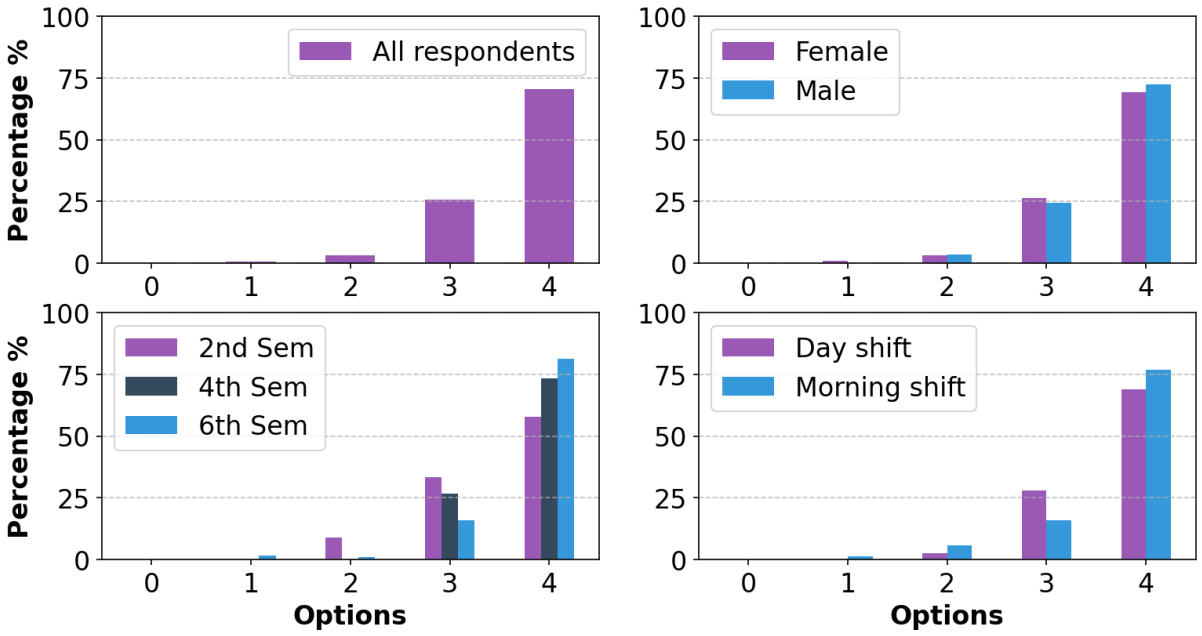

Figure 18: *Bar charts of the percentage of response obtained for various options for question-18 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	9	25	60	145	124
Percentage of responses	2.5 %	6.9 %	16.5 %	39.9 %	34.2 %

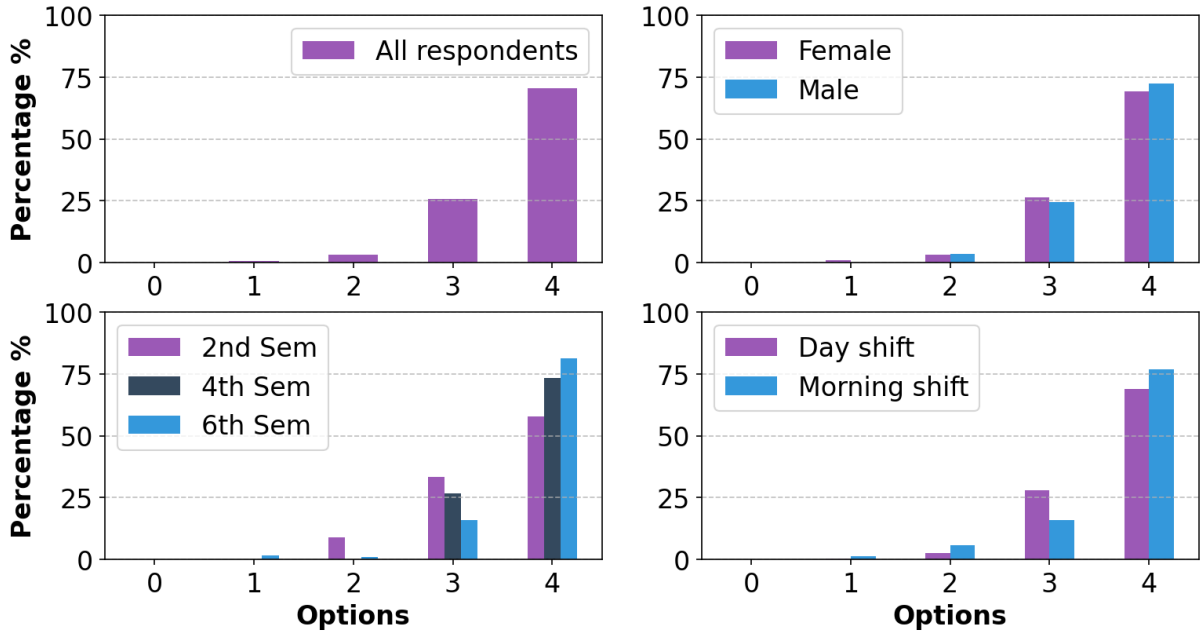

Figure 19: *Bar charts of the percentage of response obtained for various options for question-19 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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	0	2	33	163	165
Percentage of responses	0.0 %	0.6 %	9.1 %	44.9 %	45.5 %

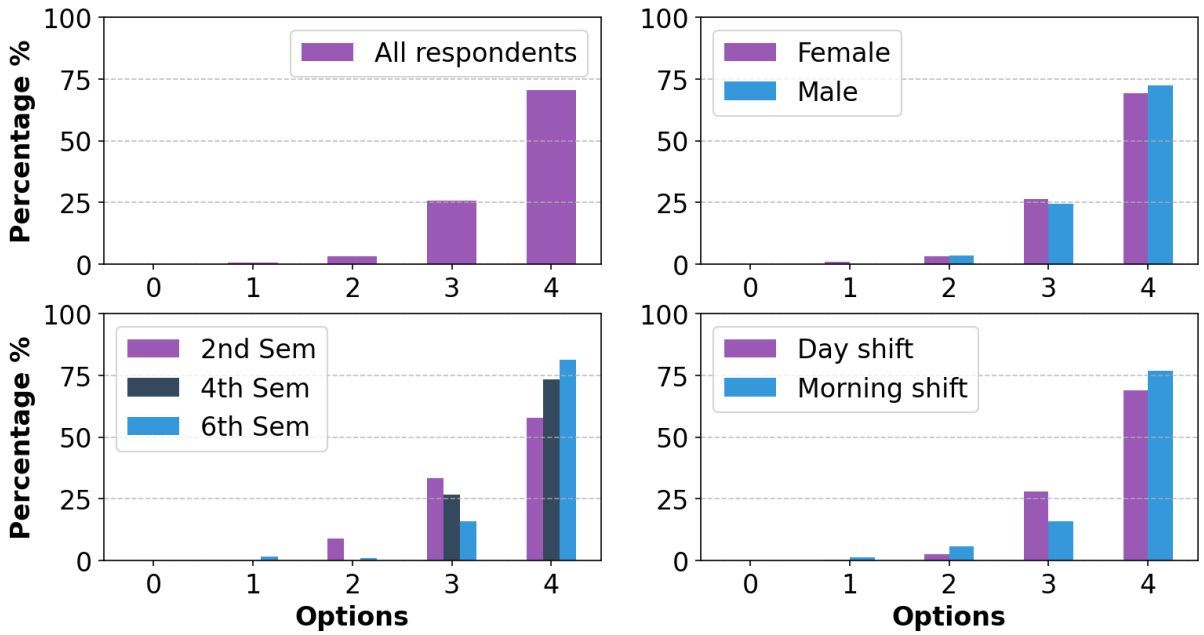

Figure 20: *Bar charts of the percentage of response obtained for various options for question-20 for all respondents (top-left), grouped by gender (top-right), grouped by semester(bottom-left), and grouped by shift (bottom-right).*

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).*

Option value	**0**	**1**	**2**	**3**	**4**
No. of responses (for all questions)	95	214	940	2821	3190
Percentage of responses	1.3 %	2.9 %	12.9 %	38.9 %	43.9 %

The data in previous table (table 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 6011 compared to 309 — the total number of responses for the lowest two satisfaction levels (0 & 1). In other words, students are roughly 20 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 2022-23

As has been stated in the 'Introduction' chapter, NAAC uses the overall mean value obtained in the SSS 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: 3.21

Cronbach's alpha of the survey: 0.926

Standard deviation of the satisfaction scores: 0.87

As we can see, the satisfaction score tilts towards the higher rating side. 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. The overall standard deviation is not very high (it can range from 0 to any value; for the present dataset the higher end is estimated to be about 2) 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.

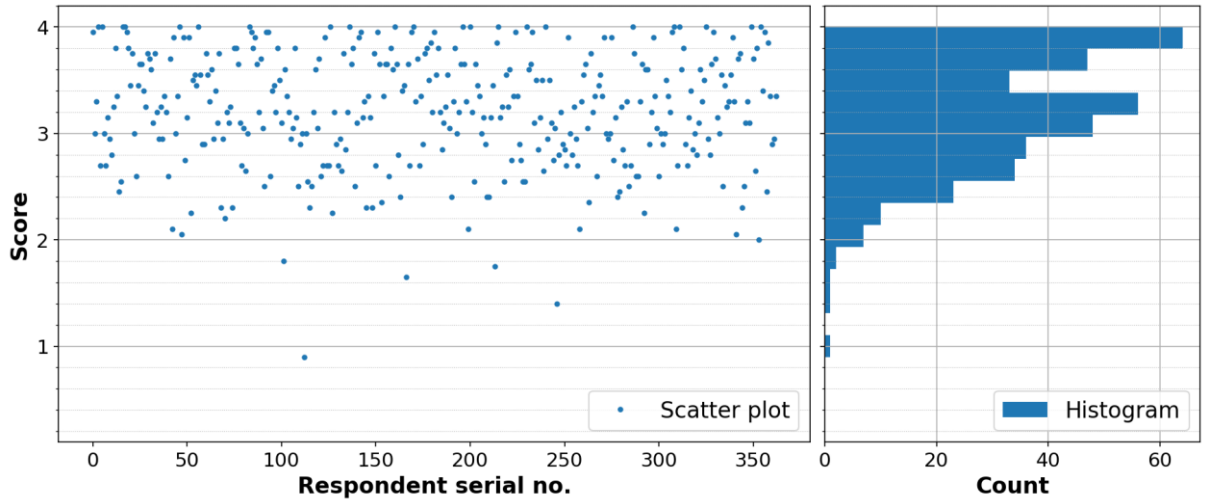

Figure 21: *Graphs showing the distribution of scores. The graph on the left is a scatter plot of respondent vs scores; the graph on the right is a histogram (with 15 bins) of the distribution of scores among respondents.*

We see a notable concentration of values approximately between 2 and 4 and very few values below 2; this visually justifies our claim of relatively low variability of the total scores. We also see two peaks between scores 3 and 4, potentially attributable to the granularity/discreteness of the option value. This, of course, serves to justify and put into perspective the value of the overall SSS score of 3.21 obtained in the previous section.

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 better serve to better explain the Cronbach's alpha rather than the total standard deviation obtained in the previous section.

Figure (21) shows a roughly normal distribution centred around 0.6. 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 2 – 3 times in 20 questions; for example, a score of 2 twice and 4 eighteen times gives a standard deviation of 0.6).

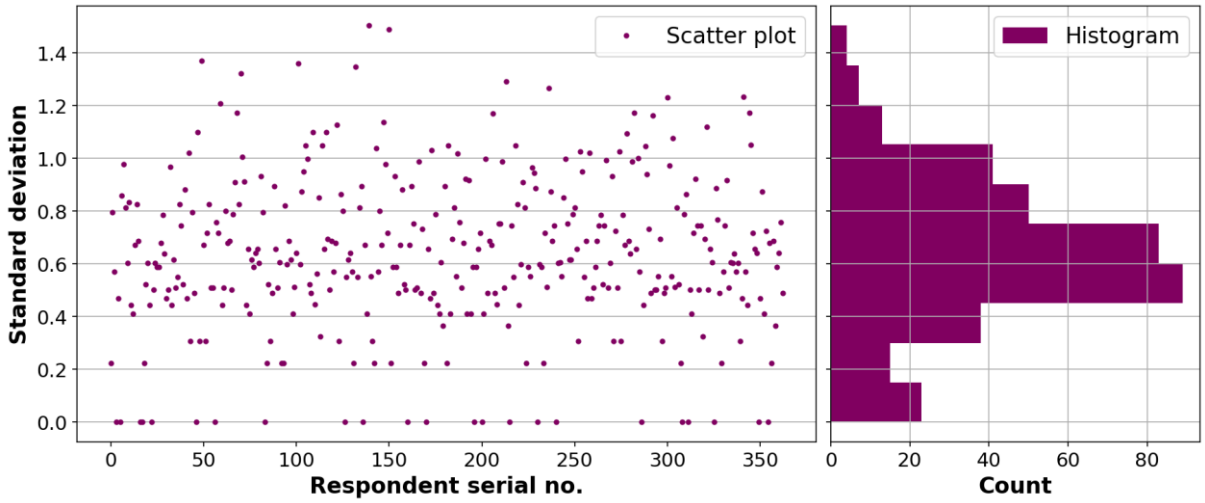

Figure 22: *Graphs showing the distribution of standard deviations. The graph on the left is a scatter plot of respondent vs standard deviation; the graph on the right is a histogram (with 10 bins) of the distribution of standard deviation among respondents.*

A look at the 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.

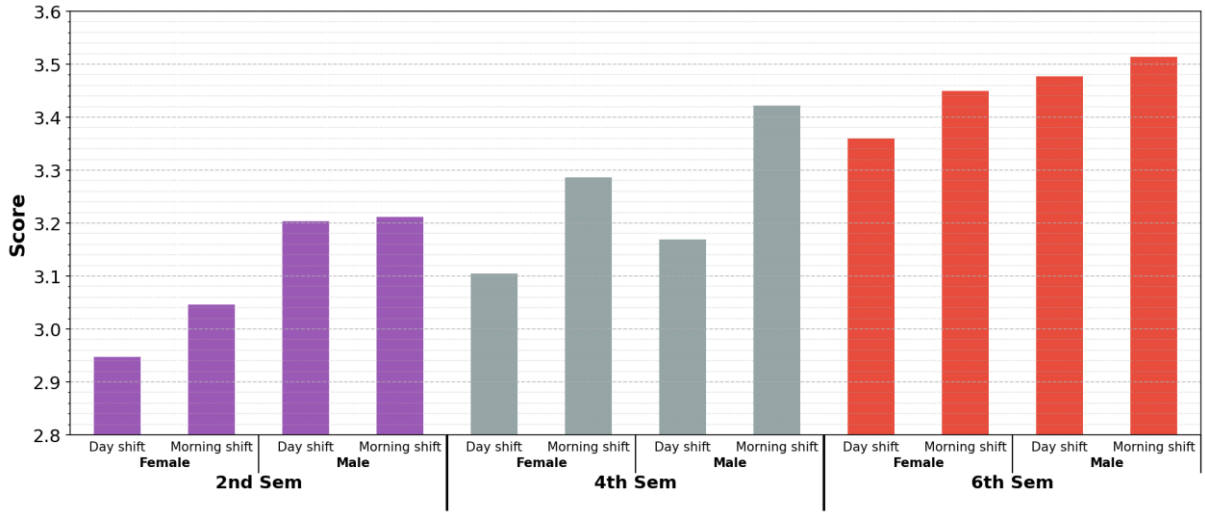

Figure 23: *Bar plot showing average scores per category (semester, gender and shift).*

We can see from the above graph that, in general, second semester scores are lower than the corresponding fourth semester scores, which are in turn lower than the sixth semester scores. Similarly, the female scores are lower than the male scores and the day-shift scores are lower than the morning-shift scores.

Comparative plot for intra-category analysis

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

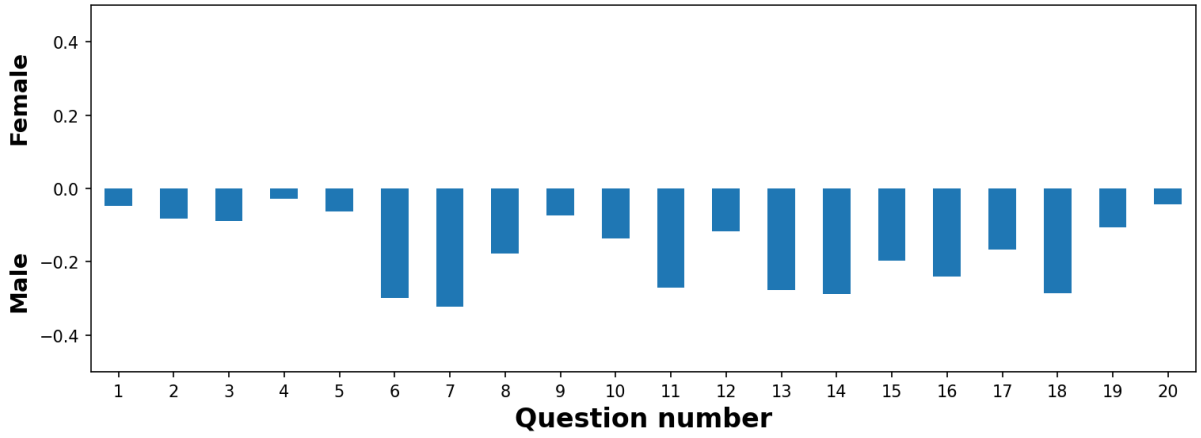

Figure 24: *Difference in the score according to gender.*

From figure (24), we can also see that the 5 questions with the highest score difference are 7, 6, 14, 18 and 13.
Next, we will look at the difference in the scores according to Shift

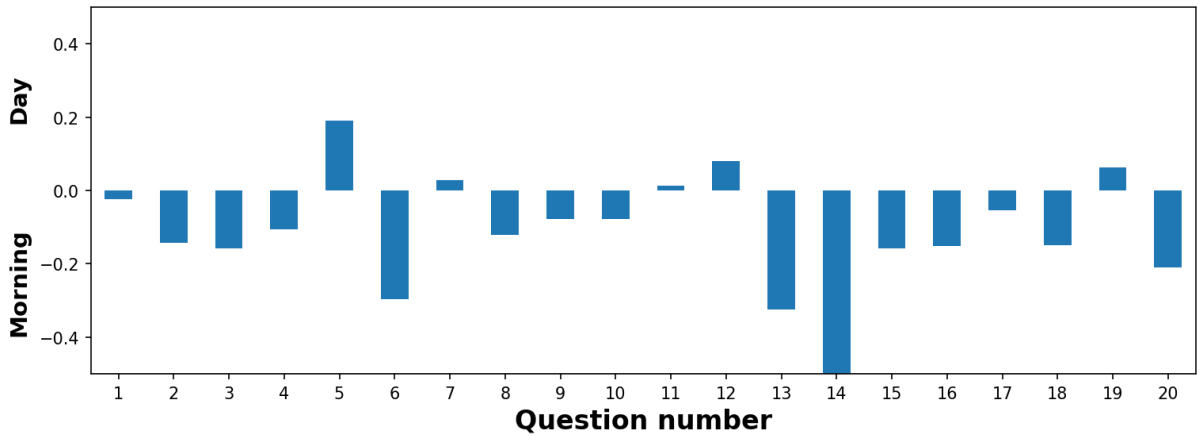

Figure 25: *Difference in the score according to shift.*

From figure (25), we can see that the scores are predominantly skewed towards the Morning Shift. In 5 questions (5, 12, 19, 7, 11), the day shift has rated higher

than the morning shift. While in 15 questions, the morning shift has rated higher (5 questions with highest difference are 14, 13, 6, 20 and 15).

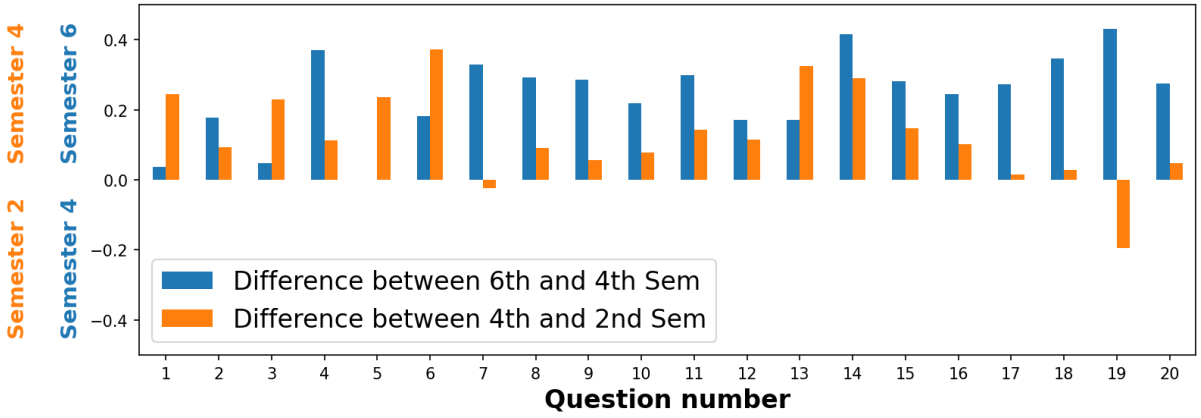

Figure 26: *Difference in the scores according to Semester. The blue bars represent the difference between the 6th semesters and 4th semesters (6th - 4th) and the orange bars represent the difference between the 4th and 2nd semesters (4th - 2nd).*

We observe (with very few exceptions) that the higher semesters have scored higher i.e., 6th semesters have given a higher score than the 4th semester and the 4th semesters have given a higher score than the 2nd semester.

Category-wise basic summary statistics and ANOVA

We summarize the data presented in the graphs in the previous section by calculating basic summary statistics like the mean, minimum, maximum, etc. of the scores enumerated by category. To delve deeper into these patterns, we employ an analysis of variance (ANOVA) approach; this methodology has been approved by many scientists (Norman, 2010).

Table 22: *Gender-wise summary statistics*

Gender	Mean	Minimum	Maximum	Standard deviation
Female	3.14	0.90	4.00	0.55
Male	3.31	1.65	4.00	0.52

The p-value of the one-way ANOVA for Gender is 0.004. 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.

***Table 23:** Shift-wise summary statistics*

Shift	Mean	Minimum	Maximum	Standard deviation
Day shift	3.19	1.40	4.00	0.53
Morning shift	3.30	0.90	4.00	0.58

The p-value of the one-way ANOVA for Shift is 0.1. 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.

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

Semester	Mean	Minimum	Maximum	Standard deviation
2nd Sem	3.05	0.90	4.00	0.57
4th Sem	3.18	1.75	4.00	0.49
6th Sem	3.42	2.10	4.00	0.50

The p-value of the one-way ANOVA for Semester is 5×10^{-07}. 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.

Identifying critical questions

In this section, we examine the survey with a focus on questions that received varying levels of favourability. 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. Similarly, by considering the highest levels from tables (28) and (29), we identify the five questions that were very favourably received by the students. Notably, questions 7 and 14 prominently appear in the lowest two options, suggesting that they require further attention. Conversely, questions 1 and 12 performed exceptionally well according to table (29).

Significant questions per individual response level

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

No. of responses	33	13	11	9	6
Question no.	**7**	**14**	**6**	**19**	**13**

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

No. of responses	35	31	25	18	16
Question no.	**14**	**7**	**19**	**16**	**18**

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

No. of responses	102	90	66	66	64
Question no.	**7**	**6**	**4**	**14**	**8**

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

No. of responses	201	189	187	181	163
Question no.	**2**	**8**	**15**	**9**	**20**

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

No. of responses	256	210	206	197	191
Question no.	**1**	**12**	**3**	**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 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
1. How much of the syllabus was covered in the class?	3.66	0.57
12. The teachers illustrate the concepts through examples and applications.	3.47	0.70
5. Fairness of the internal evaluation process by the teachers.	3.42	0.70
3. How well were the teachers able to communicate?	3.39	0.81
2. How well did the teachers prepare for the classes?	3.38	0.60
10. Teachers inform you about your expected competencies, course outcomes and programme outcomes.	3.37	0.80
20. The overall quality of teaching-learning process in your institute is very good.	3.35	0.67
17. Teachers encourage you to participate in extracurricular activities.	3.35	0.72
9. The institution provides multiple opportunities to learn and grow.	3.31	0.64
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.	3.26	0.89
15. The institution makes effort to engage students in the monitoring, review and continuous quality improvement of the teaching learning process.	3.23	0.66
13. The teachers identify your strengths and encourage you with providing right level of challenges	3.19	0.93
11. Your mentor does a necessary follow-up with an assigned task to you.	3.17	0.86
16. The institute/ teachers use student centric methods, such as experiential learning, participative learning and problem solving methodologies for enhancing learning experiences.	3.17	0.87
4. The teacher's approach to teaching can best be described as	3.13	0.79
8. The teaching and mentoring process in your institution facilitates you in cognitive, social and emotional growth.	2.99	0.82

6. Was your performance in assignments discussed with you?	2.98	1.03
19. What percentage of teachers use ICT tools such as LCD projector, Multimedia, etc. while teaching.	2.96	1.00
14. Teachers are able to identify your weaknesses and help you to overcome them.	2.89	1.12
7. The institute takes active interest in promoting internship, student exchange, field visit opportunities for students.	2.56	1.24

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 (27).

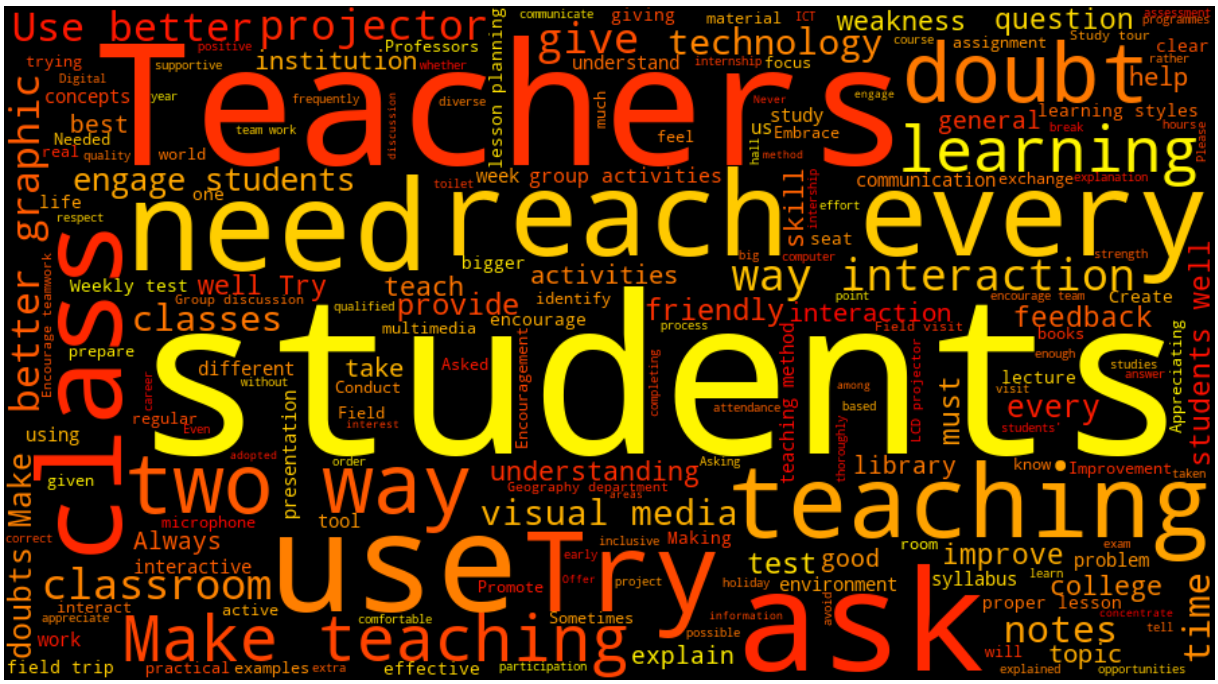

Figure 27: *Word-cloud using frequency and co-occurrence.*

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 (28) is based on the rank scores assigned to phrases.

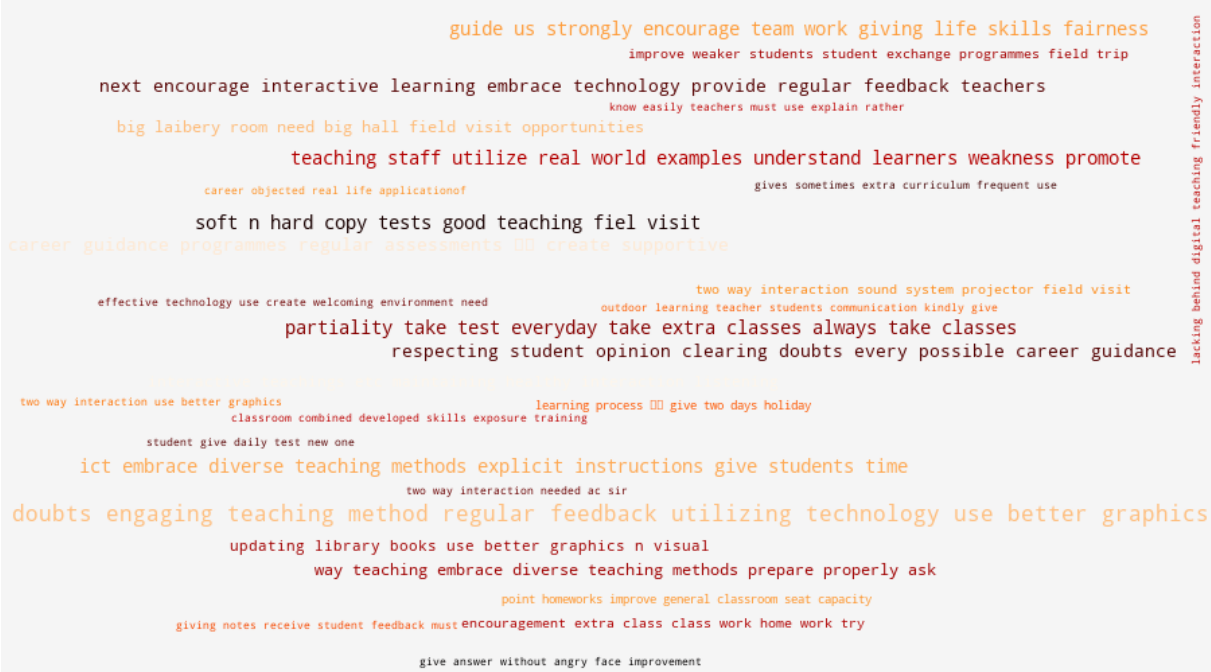

Figure 28: *Word-cloud using RAKE-NLTK.*

This approach also seems to give disappointing results; coercing this approach to work may require more expertise than available at our disposal at the moment.

Manual categorization

For manual open-ended question analysis, we identified several recurring themes in the response and associated each response to one or more key words. A frequency count was performed on the keywords. This information is presented visually in the form of a word-cloud in figure (29) and also tabulated in table (31) for precise numbers.

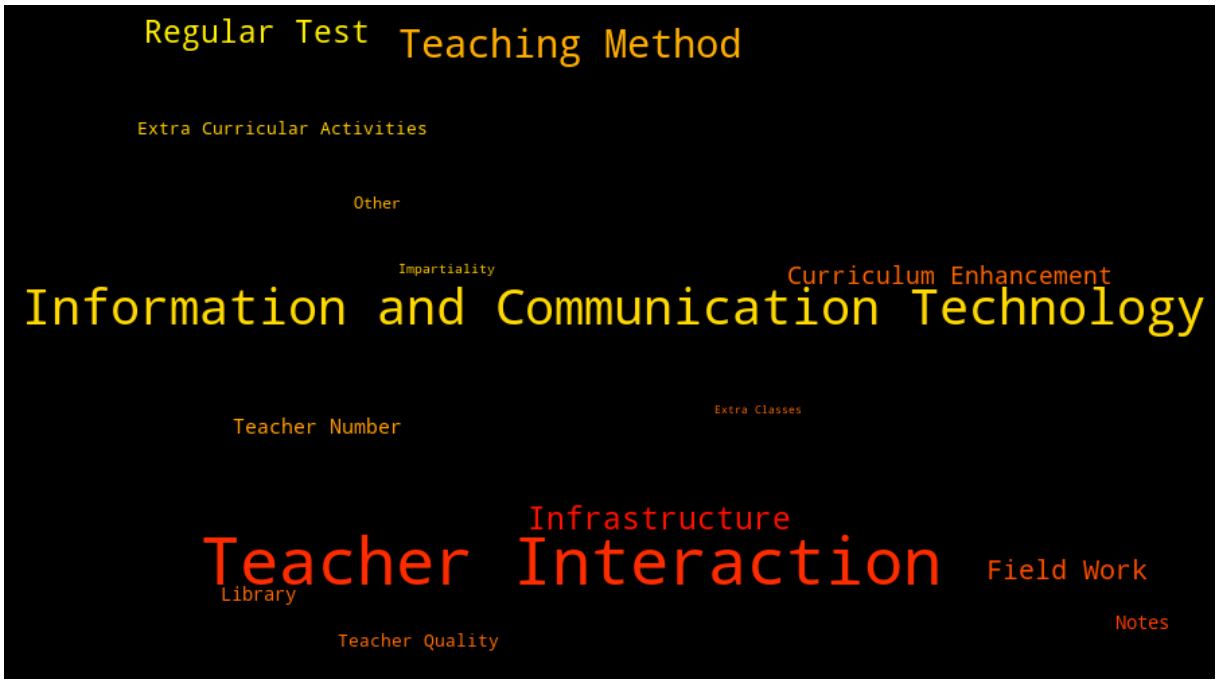

Figure 29: *Word-cloud using manual assignment.*

Table 31: *Frequency of manually assigned keywords in the response to open-ended question.*

Keyword	Frequency/Count
Teacher Interaction	86
Information and Communication Technology	69
Teaching Method	41
Regular Test	24
Infrastructure	23
Field Work	17
Curriculum Enhancement	13
Teacher Number	8
Library	7
Notes	7
Extra-Curricular Activities	6
Teacher Quality	6
Other	5
Impartiality	3
Extra Classes	2
Nil	112
Ambiguous	47

CONCLUSION AND RECOMMENDATIONS

The Student Satisfaction Survey 2022-23 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 3.21. This value is marginally above our target level of 3.2. This score serves as motivation for continued efforts aimed at not only maintaining but also improving 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. The 5 highest difference was noted for questions 7, 6, 14, 18 and 13. *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.*

Another interesting discovery involved the shift-based analysis; looking at the data by shift grouping, we find that the morning shift has, with a few exceptions, predominantly rated higher than the day shift. This suggests that student expectation affects their perceived satisfaction, as both demographics were provided with similar facilities but rated differently. *Survey/research into the expectation levels of the students should provide more context to the observed*

results. Effort should also be exerted into awareness campaigns to inform students to manage their expectations to align with the resources at the disposal of the college.

While variation was observed in the ratings given by the various semesters, but the *p*-value of ANOVA indicate that the differences might not be statistically significant. The trend in the data is expected, as new students generally enter with unusually high expectations, but, as things settle, expectations naturally mature to realistic limits.

We recommend that a few criteria in demographic categorization can be included in the future, like regularity in attendance and academic achievement. Based on the analysis of the open-ended question, we recommend that more opportunities be provided for interaction between students and teachers. ICT facilities should be enhanced.

By implementing these recommendations and actively pursuing further research, the institution can gain a deeper understanding of student perspectives, identify areas for improvement, and ultimately create a more satisfying and enriching educational experience for all. This commitment to continuous improvement, driven by student feedback, will ensure that the institution remains a leader in providing a high-quality education that meets the evolving needs and expectations of its student body.

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 (rows should be more than columns)
    if df.shape[0] > df.shape[1]:
        pass
    else:
        df = df.T

    # The calculation
    qNos= df.shape[1]
    varSum = df.var(axis=0).sum()
    sumVar = df.sum(axis=1).var()
    return qNos/(qNos- 1)*(1 - varSum/sumVar)
```

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