NAAC Student Satisfaction Survey: A Reliable and Effective Instrument for Institutional Quality Assurance

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Abstract: The effectiveness of academic practices and hence student satisfaction in terms of academic engagement is a critical issue for any higher education institute. This work proposes the NAAC student satisfaction survey as a reliable and effective instrument to gauge the academic health of the institute. It demonstrates that the student feedback on the academic practices if analyzed and followed up with appropriate actions, helps improve the student satisfaction index at the institute level and that of departments. The work proposes the hypothesis that the improvement in the student satisfaction index of the institute over four years belongs to concerted efforts and actions taken based on annual survey findings. The hypothesis is tested with the help of ANOVA to validate the findings and conclusion of the work.

Keywords: NAAC student satisfaction survey; student satisfaction index; academic health; ANOVA

I. INTRODUCTION AND LITERATURE REVIEW

Teaching-learning process is at the core of any teaching-intensive higher education institute. The effectiveness of this process directly influence the graduate outcomes in terms of placements, higher learning, research outputs or entrepreneurial efforts. Thus, assessment of teaching-learning process and the need for a metric indicating academic health of the institute becomes evident. Many institutes collect course-specific feedback from the students to gauge the academic effectiveness; however, a general feedback on teaching–learning, irrespective of faculty or the course, is desired to form an overall impression about the institutional academic ambience. Hence, student satisfaction in terms of academic engagement becomes pivotal for any higher education institute.

Earlier works have addressed student satisfaction issue in various contexts like evaluation of a new program or distance learning program, outcomes based pedagogy, effectiveness of vocational program, evaluation framework and some other. Daultani et al. (2021) identified key attributes of student satisfaction in the context of e-learning while Ghansah et al. (2021) investigated student satisfaction determinants for academic and administrative services of a private university. Silva et al. (2020) lends the students satisfaction perspective from Brazil about higher technical-vocational education. Garnjost and Lawter (2019) investigated undergraduate student perceptions across various pedagogies. Gunn (2018) addressed student satisfaction while developing a Teaching Excellence Framework (TEF) for a

university in UK. Skea (2017) presented his arguments on settling and unsettling of student expectations as a part of quality culture of an institute. Gibson (2010) reviewed the attributes which influence the students' perception of overall satisfaction. Möller (2006) presented development of a student satisfaction monitoring instrument at Utrecht University (UU) while Douglas (2006) designed and developed a questionnaire to measure student satisfaction at the faculty of business and law in a university. The abundant literature available also underlines the significance of the aspect of student satisfaction for a higher learning institute. The simplicity and reliability of the instrument used for the assessment of student satisfaction level is a key aspect.

The NAAC (National Assessment and Accreditation Council), a statutory body of UGC (University Grants Commission) is responsible for the institutional assessment and accreditation of higher educational institutes in India. The NAAC as a part of its standard process, uses Student Satisfaction Survey (SSS) - a twenty-one question questionnaire, to evaluate the teaching-learning process of the institute based on the feedback of the students. The NAAC conducts this survey online or through emails as a part of the assessment and accreditation process of the institute and offers five percent weight for the score. Out of twenty-one questions, twenty are objective while one is subjective in nature. These questions cover all the important and relevant dimensions of teaching and learning process like academic planning, course design and delivery, performance evaluation and feedback to the students. The student responses are sought on the five-point rating ranging from 0 to 4, indicating various levels of conformance to the statement. The questionnaire is available at http://www.naac.gov.in/docs/Apply%20now/SSS-Questinnaire Students.pdf (2021). The student feedback collected offers insights into academic practices and culture; and help gauge the academic ambience of the institute though it doesn't provide feedback on individual course or course teacher. This work makes an effort to demonstrate leveraging NAAC Student Satisfaction Survey questionnaire as a reliable instrument to gauge academic health of an engineering institute and thereby improve the academic experience for its students. The findings are validated statistically with the help of ANOVA. Section 2 presents details about the deployment of the survey by the institute while section 3 presents the key findings based on the analysis of collected feedback. The 'Discussion' section discusses efficacy of this tool for academic health monitoring and further validated with the help of ANOVA in section 5 which is followed by the conclusion section.

II. NAAC SSS DEPLOYMENT AT THE INSTITUTE

The institute offers eight undergraduate and eleven post graduate programs through its eight departments. The number of students at any given point of time on the campus are well over 3000. An online application is developed to collect the student responses to the questionnaire annually and analyze them. Care is taken that the identity of the student is not disclosed, however, the department of the student is recorded at the time of logging into the system so as to be able to relate the student response with his/her department. This practice made it possible to capture the department academic performance in the form of the metric. It is ensured that at least 75% of student responses per department are recorded in the system. The system prevents multiple responses from the same student as well as it doesn't allow any response submission from a person not belonging to the institute. Also, the system ensures response to each and every question to be eligible for the submission of the feedback. Once the minimum % of response (viz. 75% per department) is ensured, the system is locked and the responses collected are taken for further analysis and interpretation. The questions for whom the score received is less than 3 on the scale of 0 to 4 are considered areas of concern and subsequently discussed for appropriate actions. The report generated provides a satisfaction index score for individual departments as well as for the institute. Table 1 presents the total number of respondents for each department for all the three years. The process for SSS deployment is shown in Fig. 1 while a typical report template is shown in Fig. 2. As seen in the template, the participation percentage in the survey is recorded along with some important statistics of the data like mean, median, mode and range. The mean, median and mode describe the central tendency while the range offers an idea about the dispersion

Departments	2018 - 19	2019 – 20	2020 - 21	Total
Automobile	240	195	233	**668**
Civil	161	315	357	**833**
CSE	217	278	436	**931**
Electrical	237	233	270	**740**
E & TC	278	259	270	**807**
Mechanical*	383	388	620	**1391**
MBA	126	103	210	**439**
IT	206	247	245	**698**
Total	**1848**	**2018**	**2641**	**6507**

of the data.

Table 1 Total no. of respondents

* Mechanical engineering Department offers undergraduate programs in Mechanical and Mechatronics.
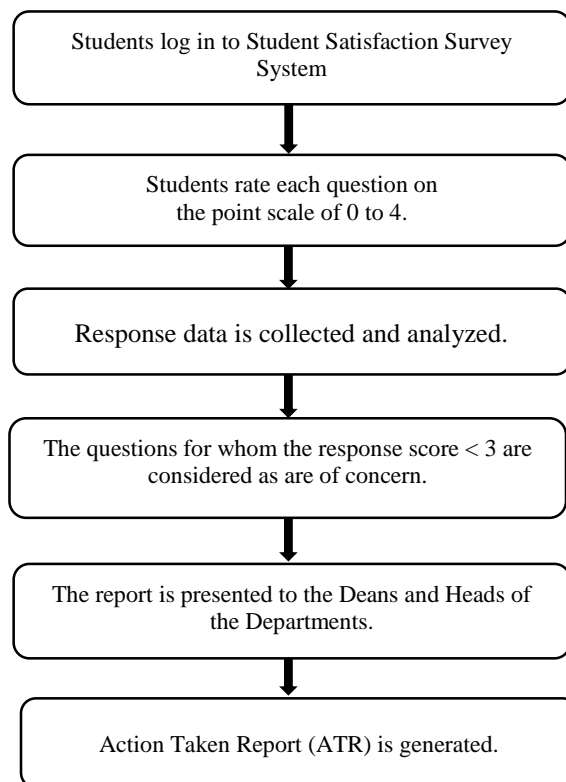

Fig. 1 The process of deployment of SSS

< The name of the institute >
A brief report presenting
Analysis of Online Student Satisfaction Survey based on NAAC instrument for AY < >

Submitted to:

- Online survey conducted during:
- Total number of students in the institute:
- Total number of respondents:
- Percentage of students participated in survey:
- Overall institute index and range:
- Survey statistics:

Academic Year	Mean	Median	Mode	Range

Department wise index with range:

Sr. No.	Department	Index	Range	Participants (%)
1	Department 1			
2	Department 2			
3	Department 3			
4	Department 4			

Questions with score less than 3.00:

Q. No.	NAAC SSS Question	Score

Suggestions received:
-
-

Complements received:
-
-

Fig. 2 The template for the typical SSS report

Following equations (i) and (ii) are used to calculate the institutional and departmental student satisfaction index.

$$\text{Institute/Department Student Satisfaction Index, SSI} = \frac{x_{q1} + x_{q2} + ---- + x_{q20}}{20} \quad \text{(i)}$$

Where, x_{q1} to x_{q20} are the average rating for questions 1 to 20.

$$\text{Average rating for each question, } x_q = \frac{\sum_{i=1}^{N} R_i}{N} \quad \text{(ii)}$$

Where, R_i is the individual rating for the question and N is the number of students in the institute/department.

III. ANALYSIS AND KEY FINDINGS OF THE SSS SURVEY

This section presents the analysis and key findings based on last three years' survey data at the institute. Fig. 3 shows the satisfaction index at the institute level. It has risen from 3.18 to 3.42 on a scale of 0 to 4.
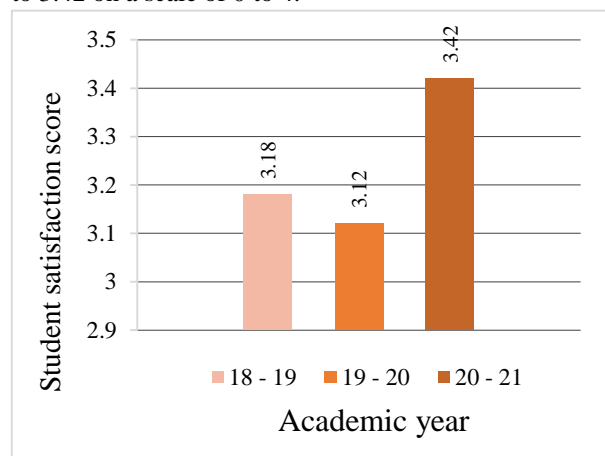

Fig. 3 Student Satisfaction Level at the institute level

Table 2 presents the survey participation level of the student's year wise while Table 3 presents department wise satisfaction indices for last three years. The pie chart in Fig. 4 presents the breakup of survey respondents for year 2020-21.

Table 2 Participation level of students in the SSS

Year	Student participation level (%)
2018-19	76.51
2019-20	76.32
2020-21	88.86

Table 3 Year wise department student satisfaction levels

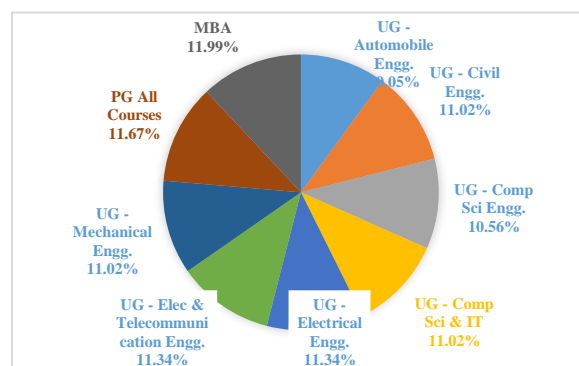|	2018-19	2019-20	2020-21	Average
Department 1	3.15	2.95	3.03	3.04
Department 2	3.16	3.36	3.50	3.34
Department 3	3.38	3.26	3.28	3.30
Department 4	3.26	3.30	3.47	3.34
Department 5	3.30	3.40	3.60	3.43
Department 6	3.08	3.07	3.22	3.12
Department 7	3.16	3.24	3.60	3.33
Department 8	3.40	3.80	3.65	3.61

Fig. 4 Breakup of survey respondents for 2021-22

Table 4 shows the average response received for each question over the last three years. It helps understand the year wise variation in responses and gives an idea about the trend in general.

Table 4 Question-wise average scores

Question No.	Question	Average score 2018 – 19	Average score 2019 - 20	Average score 2020 - 21
1	How much of the syllabus was covered in the class?	3.4	3.2	3.7
2	How well did the teachers prepare for the classes?	3.2	3.2	3.4
3	How well were the teachers able to communicate?	3.3	3.2	3.5
4	The teacher's approach to teaching can best be described as	2.9	2.9	3.2
5	Fairness of the internal evaluation process by the teachers.	3.2	3.1	3.4
6	Was your performance in assignments discussed with you?	3.2	3	3.4
7	The institute takes active interest in promoting internship, student exchange, and field visit opportunities for students.	3.2	3.1	3.4
8	The teaching and mentoring process in your institution facilitates you in cognitive, social and emotional growth.	3	3	3.3
9	The institution provides multiple opportunities to learn and grow.	3.2	3.2	3.4

Question No.	Question	Average score 2018 – 19	Average score 2019 - 20	Average score 2020 - 21
10	Teachers inform you about your expected competencies, course outcomes and programme outcomes.	3.4	3.3	3.5
11	Your mentor does a necessary follow-up with an assigned task to you.	3.3	3.2	3.4
12	The teachers illustrate the concepts through examples and applications.	3.3	3.2	3.5
13	The teachers identify your strengths and encourage you with providing right level of challenges.	2.9	2.9	3.2
14	Teachers are able to identify your weaknesses and help you to overcome them.	2.8	2.8	3.2
15	The institution makes effort to engage students in the monitoring, review and continuous quality improvement of the teaching learning process.	3.2	3.1	3.4
16	The institute/ teachers use student centric methods, such as experiential learning, participative learning and problem solving methodologies for enhancing learning experiences.	3.2	3.2	3.4
17	Teachers encourage you to participate in extracurricular activities.	3.1	3.1	*
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.	3.2	3.2	3.5
19	What percentage of teachers use ICT tools such as LCD projector, Multimedia, etc. while teaching?	3.4	3.3	3.6
20	The overall quality of teaching-learning process in your institute is very good.	3.2	3.1	3.4
Overall average		3.18	3.12	3.42

(* indicates that the question 17 was not considered for the year 2020-21 on account of COVID pandemic interruptions.)

Table 5 presents the descriptive statistics for the three years' datasets of question wise average scores, presented in Table 4 above. It offers insights into central tendency and dispersion of the year wise data.

Table 5 Descriptive statistics for question-wise average scores

Year and statistical parameter	2018-19	2019-20	2020-21
Mean	3.1800	3.1150	3.1405
Median	3.2000	3.1500	3.4000
Mode	3.20	3.20	3.40
Standard deviation	.16733	.13485	.12865
Variance	.028	.018	.017
Range	.060	.050	.50
Sample size	20	20	19
Missing Value	0	0	1

Fig. 5 NAAC SSS score of the institute during accreditation process

IV. DISCUSSIONS

Table 1 indicates that the student participation in the survey is ensured to be more than 75%. It is obvious from Fig. 3 that the satisfaction index for the institute has risen from 3.18 to 3.42 over the period of three years. The satisfaction level for the departments have also risen in general. All the departments, on average, scored more than 3 on a scale of 0 to 4. All the departments except Department 1 and 3 report rising levels of student's satisfaction. It is obvious that the rising departmental student satisfaction indices has led to the rise in institutional student satisfaction level index.
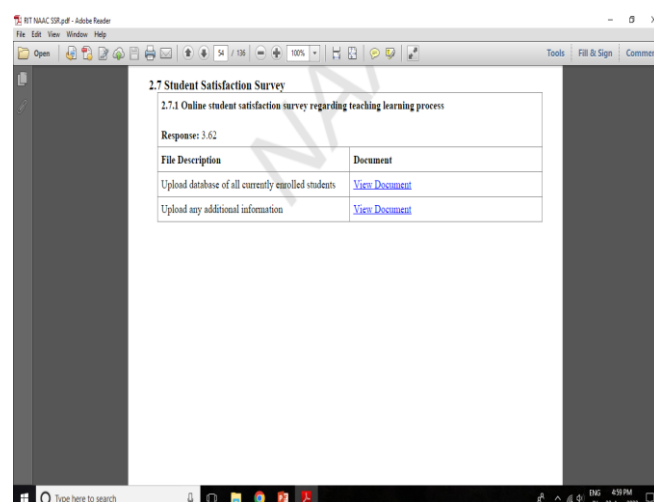
The average responses for various questions (2, 4, 8, 9, 13, 14, 16 and 18) as seen from Table 4 show rising trend for the three successive years. The institute scored 3.62 in NAAC SSS administered by NAAC as a part of accreditation cycle during February-March 2022 (Fig. 5).

The consistent rise in the student satisfaction level is attributed to the academic practices and measures taken with reference to

the NAAC SSS instrument. The students were made aware about these practices and measures before the survey. The meaning of some of the questions was explained to the students and it was ensured that they understood the questions before they record feedback. The analysis of the feedback was shared with Deans and the Heads of the Departments. The Heads in turn shared the findings with the faculty members. This communication with the faculty members was very important as then they realized the nuances and expectations with regard to course planning, delivery and assessment. The corrective actions taken by the departments were brought on record through ATRs (Action Taken Report) and were discussed in common meetings. One of the ATRs, as a sample, is presented as Table 6 for illustration purpose. Declaration of individual

Ha – There is significant difference among the average rating scores of the SSS. i. e. The score has been improved owing to concerted efforts.

The ANOVA table with F-statistic is presented below (Table 7). Calculated value of F is 16.20 which is greater than the table value of 3.15 (2004) at 95% confidence level. Thus the null hypothesis is rejected which means the variance among the three years' datasets is significant. The alternate hypothesis is supported meaning the difference among the average rating scores of the SSS over the period is due to the specific actions taken. Since the rising trend of satisfaction index is observed across all the departments, it is argued that the hypothesis remains supported for all the departments.

The overall experience of SSS underlines the efficacy of the

Table 6 Sample Action Taken Report (ATR)

Name of the Department	Head of the Department	Please brief the action plan for the AY 2020 – 21 to improve the teaching learning process and student satisfaction index of the department
		1. The mentoring process in the department is being effectively implemented by conducting regular meetings of students with mentors & senior Professors to resolve the queries. 2. The orientation program is planned for the teachers to make the teaching more effective by adopting various active learning tools and techniques. 3. The students' strengths and weaknesses (i.e. existing skills available with students) shall be identified at the entry level in the department and efforts shall be taken to overcome these weaknesses (gaps in the skills) by organizing related activities.

department satisfaction index scores led to competitive spirit among the departments as every department wanted to remain at the top of the chart. The last question of the instrument allowed the students to register their qualitative feedback. This qualitative feedback helped the academic leaders to pinpoint the problem areas and address them subsequently. During the

NAAC SSS instrument as a tool for academic improvement. The student satisfaction survey made on annual basis and follow up corrective actions lead to the betterment of academic health of the departments and thereby the institute as well.

VI. CONCLUSION

Table 7 ANOVA Table

Source of variation	Sum of squares	Degree of freedom	Mean Square	F-Ratio	5% of F-limit (from the F-table)
Between Samples	1.008	(3-1) = 2	1.008/2 =0.504	0.504/0.0311= 16.20	F(2,57) =3.15
Within Sample	1.776	(60-3)=57	1.776/57=0.0311		
Total	2.784	(60-1) =59			

academic years 2018-19 and 2019-20, i.e. pre-COVID times, all the classes were engaged offline. During academic year 2020-21, owing to COVID-19 pandemic, for majority of the period, the classes were held online. The faculty members took extra efforts during online academic planning and delivery so as to ensure effective course content delivery and quality learning experience for the students. They used various active learning tools like Kahoot, MS form, Socratis to engage the students online. Despite the pandemic disturbance, the online educational experience for the students was maintained seamless and comparatively smoother. For majority of 2021-22, the classes were held offline and the satisfaction level was seen to be improving as reflected in NAAC SSS.

V. STATISTICAL VALIDATION

The impact of the NAAC SSS instrument is validated statistically with the help of following hypotheses and one-way ANOVA i.e. Analysis of Variance. The proposed hypotheses with 95% confidence level are:

H0 – There is no significant variation among the average rating scores of the SSS. i. e. means are equal.

This work deals with improvement of academic ambience of an institute. Effective and relevant academic practices ensure the intended graduate outcomes. It demonstrates use of NAAC SSS instrument as a reliable tool to collect the student feedback on academics annually for three successive years and gradual rise in student satisfaction index of departments and the institute; as an outcome of corrective actions through participative approach. The findings are validated with the help of hypothesis testing using ANOVA. The null hypothesis is rejected which means difference among the average rating scores of the SSS belongs to the course corrective actions taken at the department and institute level to improve the academics. Based on the experience of past three years, it is concluded that this practice of conducting the SSS on annual basis to gauge academic health of the institute could be regularized as one of the quality assurance strategy by an institute which wish to improve its academic experience and ambience.

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