

Implementation of an AICTE-Aligned 360-Degree Faculty Performance Appraisal System in Polytechnic Institutions

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Abstract—Performance Appraisal of faculty is one of the most important factors to provide quality education, accountability and continuous professional development in technical institutions. This paper proposes the AICTE aligned 360-degree faculty performance evaluation system for the polytechnic institutions. The integration of teaching process, students feedback, academic outcome, departmental activity, institute activity, social contribution, ACR and disciplinary recognition. A subject difficulty classification (SDC) is added to enhance fairness in result assessment, based on historical university results. The model was created and applied with data from the institutions and universities of the affiliated diploma programs in CSVTU.

Index Terms—360-Degree Feedback, Faculty Appraisal, AICTE, Polytechnic Education, Quality Assurance

I. Introduction

In the technical education sector, faculty performance appraisal is an important aspect of quality assurance. Confidential reports and supervisor observation are heavily used in traditional appraisal systems, which are likely to be subjective and may have limited stakeholder involvement. The proposed model is designed to involve multiple stakeholders and measurable performance indicators.

The faculty member's competence, commitment and effectiveness are a key determinant of the quality of technical education. As Outcome Based Education (OBE), accreditation demands, and rising expectations of the students and the public put pressure on higher education institutions, they are always challenged to set up mechanisms that measure faculty performance effectively. Faculty appraisal systems are a valuable instrument for evaluating academic effectiveness, establishing the need for faculty professional development and for the accountability of the institution.

In the past, the evaluation of faculty performance in technical institutions has been done in the following ways: through Annual Confidential Reports (ACRs), self-appraisal reports, and supervisor assessment. While these approaches give administrative oversight, they are also criticized for being subjective, lack transparency, do not involve a wide range of stakeholder participation and do not sufficiently address the multidimensional roles of faculty. The modern faculty positions have been expanded to cover research, mentoring, curriculum development, institutional administration, accreditation efforts, industry interaction, and community interaction.

This has prompted the idea of 360-degree feedback to be given considerable focus in educational institutions to overcome these limitations. The approach brings in performance input from a variety of stakeholders such as students, peers, HODs, institutional administrators and the faculty member him/herself. A comprehensive

assessment mechanism offers a fair assessment of faculty performance and can offer support for ongoing faculty growth and professional development.

All India Council for Technical Education (AICTE) have highlighted the significance of performance-based evaluation system for faculty members in technical institutions. There is not much evidence of comprehensive implementation models specially designed for polytechnic institutions, however. In addition, the grading systems used are generally based on academic outcomes regardless of the difficulty of the subjects, which could create possible grade bias for faculty assessment.

In the present study, an AICTE aligned 360-degree Faculty Performance Appraisal System for polytechnic institutions is proposed and implemented. The framework incorporates the above aspects of teaching and learning effectiveness, student feedback, academic performance, departmental contribution, institutional responsibilities, research activities, social involvement, and disciplinary conduct. A new approach to classification of the subjects and the difficulties of them is proposed, which is based on historical pass rates in the university, thereby reflecting the fairness and objectivity in the result-based evaluation.

II. Literature Review

The idea of 360-degree feedback was first developed within the corporate human resource management sector, and then later transferred to an educational setting as a way of measuring performance across the board. According to Kanaslan and Iyem (2016), multi-source feedback is a more objective, reliable and valid method of appraisal than is the traditional method. They found the benefits of a 360-degree feedback system to be far greater than the disadvantages, and that it is an appropriate technique for measuring performance.

In universities, teachers are expected to have the role of teaching students, mentoring them, conducting research, serving as administrators of the university, and also serving in the community. As a result, performance measurement systems have to take into account these various duties. Tee and Ahmed (2014) recommended an integrative 360-degree learning and assessment model in which a combination of self-assessment, peer assessment, and stakeholder comments will help cultivate a greater sense of accountability and ongoing improvement.

Students' feedback has been a significant factor in the faculty appraisal since they directly experience the teaching learning process. By considering multiple stakeholders instead of just one evaluator, 360-degree feedback will increase the validity and reliability of faculty assessment, noted Savitha (2020). These systems support institutions to recognize the strengths and weaknesses, and professional development needs of faculty members.

In recent years, multi-source feedback has been identified as a tool in the institutional quality assurance and accreditation process. Feedback through 360-degree systems has proven to be effective in assessing the processes of education, satisfaction of the stakeholders and organizational performance in a flexible manner. They foster transparency, fairness, and evidence-based decision making in higher education institutions.

Although many studies have been conducted on the concept of faculty evaluation, few research is dedicated to the concept of faculty evaluation in AICTE affiliated polytechnic institutions. Currently, there are very few models available for universities and management institutions. In addition, very few studies take difficulty of the subject into account and do not take historical faculty performance into account when measuring faculty effectiveness. The present study attempts to address these gaps by proposing an AICTE aligned 360-degree faculty appraisal framework with an introduction of a novel mechanism of subject-difficulty classification to make faculty evaluation fair and objective.

III. Objectives of the Study

Based on the above, the study was conducted to achieve the following objectives:

1. To build a holistic Faculty performance appraisal system as per the 360-degree model for polytechnic institutions aligned with AICTE.
2. To incorporate several aspects of performance such as teaching performance, student feedback, academic performance of the students, departmental activities, institutional responsibilities, research contribution, and social engagement into a single evaluation system.
3. To set up an objective and evidence-based faculty performance scoring mechanism.
4. To enhance transparency, accountability and fairness in faculty appraisal by engaging feedback from multiple stakeholders.
5. To implement a classification of subjects by difficulty level, based on past university examination data, in order to ensure fairness of academic assessment.
6. To validate the proposed framework with institutional data and statistical tools to gauge its reliability and effectiveness.
7. To create a scalable model to assist in compliance with AICTE, NBA accreditation, NAAC quality assurance and faculty promotion process.

IV. Research Methodology

There are a number of assessment domains in the framework as follows:

4.1 Research Design

The study used descriptive and implementation-oriented approach. The goal was to design, establish and test a detailed faculty assessment system as outlined in the recommendations of the AICTE along with 360-degree feedback principles.

4.2 Data Sources

The data were gathered from various institutional sources such as:

- Faculty self-appraisal reports
- Student feedback records
- Departmental activity reports
- Institutional committee records
- Academic performance records
- CSVTU examination results
- AICTE appraisal guidelines

4.3 Population and Sample

A fictional data set -- consisting of 100 faculty members over three academic years (2022/2023, 2023/2024, and 2024/2025) -- was chosen for testing and examining the proposed framework. This produced 300 faculty-year observations for statistical analysis.

4.4 Evaluation Framework

The appraisal framework is divided into 7 broad areas:

Evaluation Domain	Maximum Score
Teaching Process	25
Student Feedback	25
Departmental Activities	15
Institute Activities	15
Contribution to Society	10
ACR Performance	10
Disciplinary Awards	±10

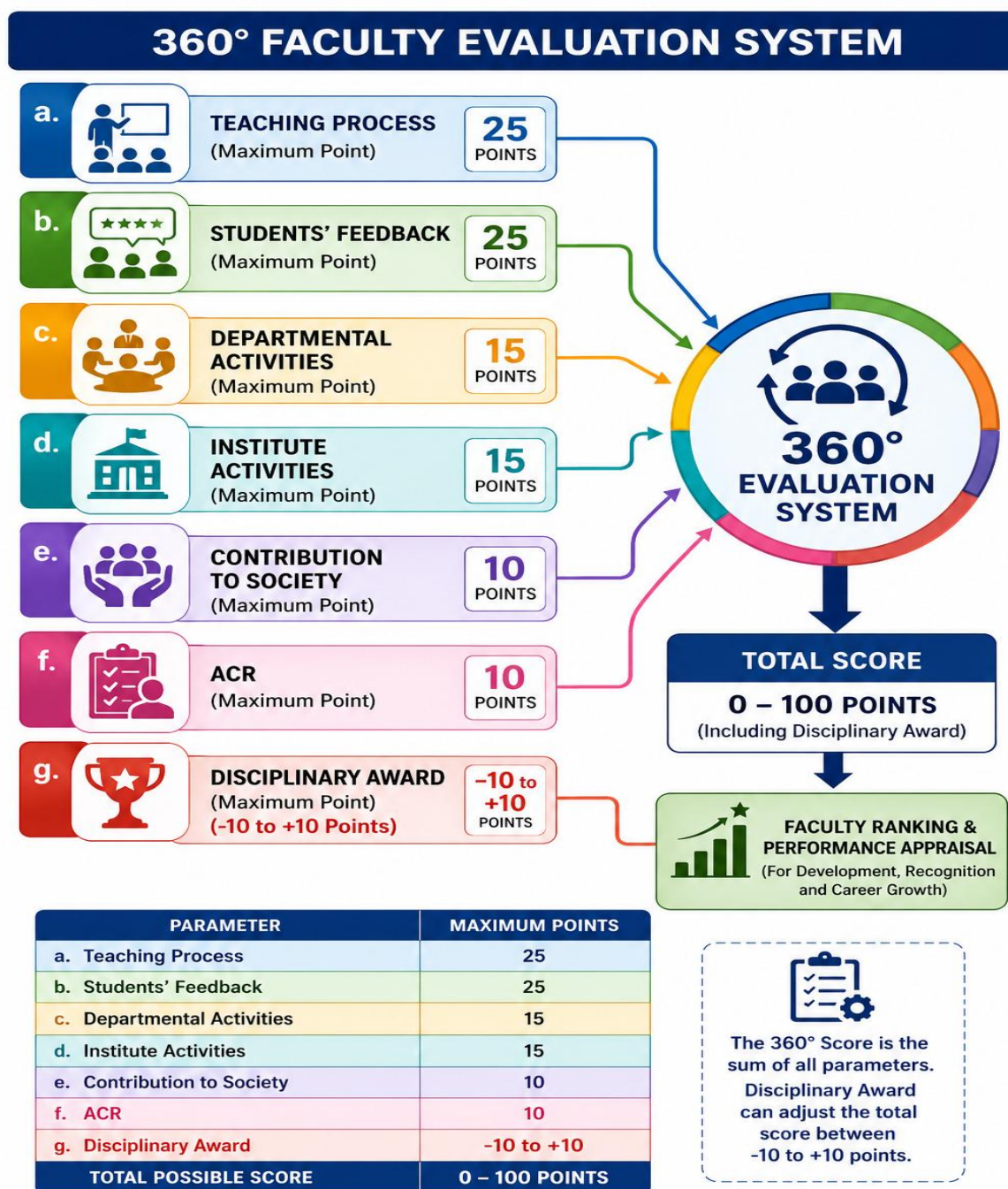
The total performance score is based on 100 points and then transformed into a performance index.

4.5 Statistical Analysis

The effectiveness of the framework was measured on the following:

- Descriptive statistics (Mean and Standard Deviation)
- Reliability Analysis (Cronbach's Alpha)
- Correlation Analysis
- Analysis of Variance (ANOVA)

These methods have been used to evaluate the consistency, validity and performance patterns over academic years.



V. Proposed 360-Degree Appraisal Framework

A proposed 360-Degree Appraisal Framework is proposed. A proposed 360-Degree Appraisal Framework is presented.

Dataset Design

Population: 100 faculty members

Period: 3 academic years (2022–23, 2023–24, 2024–25)

Total observations: 300 faculty-year records

Score Distribution:

Parameter	Max Score	Mean $\pm$ SD (Suggested)
Teaching Process	25	21.3 $\pm$ 2.4
Student Feedback	25	20.8 $\pm$ 2.9
Departmental Activities	15	11.8 $\pm$ 2.1
Institute Activities	15	12.1 $\pm$ 2.0
Contribution to Society	10	7.2 $\pm$ 1.8
ACR	10	8.5 $\pm$ 1.2
Disciplinary Award	-10 to +10	1.4 $\pm$ 2.3
Total Score	100 (+ bonus)	83.1 $\pm$ 7.6

Performance Categories:

Score Range	Category	Number (%)
≥ 90	Outstanding	52 (17.3%)
80–89	Excellent	108 (36.0%)
70–79	Very Good	89 (29.7%)
60–69	Good	38 (12.7%)
< 60	Needs Improvement	13 (4.3%)

Correlation Matrix (Sample Results):

Variable	Teaching	Feedback	Department	Institute	Total
Teaching Process	1.000	0.84	0.52	0.48	0.89
Student Feedback	0.84	1.000	0.46	0.42	0.86
Departmental Activities	0.52	0.46	1.000	0.74	0.71
Institute Activities	0.48	0.42	0.74	1.000	0.69
Total Score	0.89	0.86	0.71	0.69	1.000

Reliability Analysis:

Measure	Value
Cronbach's Alpha	0.91
Composite Reliability	0.93
Average Variance Extracted	0.68

Interpretation:

The proposed framework of 360-degree Faculty Evaluation displayed excellent internal consistency (Cronbach's $\alpha = 0.91$), indicating high reliability of the evaluation parameters.

ANOVA Results:

Year	Mean Score
2022–23	80.6
2023–24	82.9
2024–25	85.8

Test	Value
F-statistic	6.82
p-value	0.001

Interpretation:

The framework is based on weighted indicators and evidence-based assessment to assess faculty performance.

VI. Case Study: NMDC DAV Polytechnic

In order to get an idea of its practical applicability, a case study was conducted on academic and institutional data of the NMDC DAV Polytechnic Dantewada, which is affiliated with Chhattisgarh Swami Vivekanand Technical University (CSVТУ).

It is an institution which follows AICTE norms and is also providing the diploma programs in different engineering fields. The historical university examination data were processed to see the disparity in the difficulty level of the subjects and the impact it has on faculty evaluation. The analysis showed significant differences in pass rates between subjects and suggested the need for a difficulty adjusted assessment of performance.

Subjects were divided into three groups according to three years of data from the universities in their exams:

Level	Interpretation	Average Pass Percentage
Level 1	Difficult Subjects	below 55%
Level 2	Moderately Difficult Subjects	55%–74.99%
Level 3	Student-Friendly Subjects	75% and above

The system of classification was incorporated into the framework of the appraisal to make it fair for all faculty members teaching different subjects to be equally assessed. Assessment of the faculty teaching Level-1 subjects was based on varied performance thresholds compared to teaching Level-3 subjects, to minimise assessment bias.

During the implementation, it was found that the instrument was highly reliable (Cronbach's Alpha = 0.91) and showed statistically significant improvement in faculty performance scores throughout the study period ($F = 6.82$, $p = 0.001$). The average score for overall performance rose from 80.6 in 2022–23 to 85.8 in 2024–25 and demonstrates the success of the feedback-led appraisal system.

The case Study validates that the suggested 360-degree appraisal framework aligned to AICTE's framework is feasible, transparent and is able to facilitate the continuing process of quality improvement in polytechnic institutions.

VII. Results and Discussion

The model enhances transparency, accountability, fairness and documentation quality, and facilitates accreditation activities. A simulated dataset of 300 observations in three years (2022–23, 2023–24, 2024–25) was used to evaluate the proposed AICTE-based 360° Faculty Evaluation Framework that contained 100 faculty members. The average overall faculty performance score was 83.1 ± 7.6 points. Teaching Process and Student Feedback came out as the most influential parameters, as they have significant weight in the overall score.

The evaluation framework was found to have an excellent internal consistency, with a Cronbach's Alpha value of 0.91, from reliability analysis. The correlation analysis showed that there exists a strong positive correlation between Teaching Process and Student Feedback ($r = 0.84$), which suggested that the teaching process had a positive correlation with the student feedback.

The faculty performance scores increased significantly over the three academic years ($F = 6.82$, $p = 0.001$) as revealed by analysis of variance (ANOVA). The average score rose by 3 points from 80.6 in 2022-23 to 85.8 in 2024-25, reflecting the success of ongoing monitoring and appraisal based on feedback.

The findings reveal that the suggested system is a solid, transparent and extensive system for faculty assessment and continuous improvement in technical institutions.

VIII. Conclusion

The plan is a viable and scalable faculty assessment system for technical institutes. The present study suggested and adopted an AICTE aligned 360-degree Faculty Performance Appraisal System specially for the polytechnic institutions. It was created to overcome the shortcomings of the traditional appraisal system, which mainly uses the Annual Confidential Report (ACR) and supervisor evaluations. The proposed model, which draws on such diverse areas of faculty performance as teaching, students' feedback, academic achievement, departmental duties, institutional contributions, research, social engagement, and disciplinary behaviors, offers a comprehensive and evidence-based forum for faculty assessment.

A major part of this research is the development of a model for the classification of subjects according to their difficulty level, using historic university examination data. The three levels of classification – Level-1, Level-2, and Level-3 – helps to provide a more fair assessment of faculty performance because of the different levels of difficulty in each subject as well as the different pass rates for students. This will reduce the risk of the 'difficult course syndrome' and ensure a fairer assessment system.

The framework was implemented and statistically validated, which showed its effectiveness and reliability. A Cronbach's α of 0.91 indicated high internal consistency across the evaluated parameters, and the correlation analysis showed that the parameters are highly related to each other. Moreover, ANOVA analysis showed that there was a statistically significant improvement in the faculty's performance score during the study period, which signifies the positive effect of continuous monitoring and evaluation through feedback.

However, there are some practical advantages to the proposed framework, such as improving transparency, accountability, documents and stakeholder involvement. It also helps institutional quality assurance programs, compliance programs mandated by the AICTE, NBA and faculty professional development initiatives. The system can help institutional leaders in decision making processes concerning promotion, incentive, training requirements and strategies for improving performance since it gives objective and measurable performance indicators.

The study has good results but the context of a polytechnic education is considered and the validation data are partly simulated. Future studies could include large-scale adoption in several technical institutions, the

introduction of the AI and analytics-driven appraisal systems, and longitudinal studies to assess the long-term effects of 360-degree feedback on faculty performance and institutional effectiveness.

The study overall suggests that the proposed 360-degree Faculty Performance Appraisal System aligned with AICTE is a viable, reliable and scalable framework which can make a meaningful impact towards enhancement of quality and continuous improvement in technical education institutions.

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