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ANALYSIS OF FACULTY PERCEPTIONS IN PRIVATE UNIVERSITY OF BHOPAL (M.P.) THROUGH STATICS METHOD USING PYTHON

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ABSTRACT

This study aims to assess faculty perceptions in private universities located in Bhopal, Madhya Pradesh. By identifying key parameters influencing faculty satisfaction, evaluating institutional policies, and applying statistical analysis, the research provides actionable insights to enhance faculty experiences and align institutional practices with academic excellence. The findings are expected to aid policymakers in fostering a more conducive academic environment.

1. INTRODUCTION

The study employs a descriptive survey research design to investigate faculty perceptions within private universities in Bhopal, Madhya Pradesh. This research design is particularly well-suited to the study's objectives, as it facilitates a systematic exploration of faculty attitudes, experiences, and opinions related to institutional dynamics and orientation programs [1,2]. Faculty perceptions play a pivotal role in determining the quality of education and overall institutional success. In the context of private universities in Bhopal, understanding faculty satisfaction is critical for improving academic performance and retention[3]. This study seeks to explore factors that influence faculty perceptions and offer recommendations to address potential gaps. The primary objectives of this research are:

1. Evaluate the impact of institutional policies, infrastructure, and management practices on faculty satisfaction.
2. Conduct statistical analysis using Python to validate hypotheses (including P-value and t-statistics).
3. Validate hypotheses for each parameter based on the test results.

2. METHODOLOGY

2.1. Identification of Key Parameters A thorough review of existing literature and discussions with academic professionals were conducted to identify critical factors influencing faculty perceptions. These parameters include institutional policies, workload, professional development opportunities, management practices, infrastructure, and work-life balance [4,5].

2.2. Survey Form Design A survey form was designed to collect primary data from faculty members. The form includes sections for demographic details and Likert-scale questions addressing each identified parameter[6,7].

2.3. Data Collection The survey was distributed among faculty members of selected private universities in Bhopal. Participants were chosen using a stratified sampling technique to ensure representation from various disciplines and levels of experience[8,9].

2.4. Statistical Analysis Data collected from the survey were analyzed using Python. The following tests were employed:

- **P-value Analysis:** To determine the statistical significance of the results.
- **t-Statistics:** To test the hypotheses for each parameter.

2.5. Hypothesis Development The null and alternative hypotheses formulated for each factor under investigation. To explore specific aspects of the study, the following sub-hypotheses will be tested:

1. Faculty Designation

- **Null Hypothesis (Ho):**
  There is no significant difference in faculty perceptions based on their designation.
- **Alternative Hypothesis (H1):**
  There is a significant difference in faculty perceptions based on their designation.

2. Gender

- **Null Hypothesis (Ho):**
  There is no significant difference in faculty perceptions based on gender.

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- **Alternative Hypothesis (H1):**

  There is a significant difference in faculty perceptions based on gender.

3. Satisfaction with Policy

- **Null Hypothesis (Ho):**

  Faculty members are not significantly satisfied or dissatisfied with institutional policies.

- **Alternative Hypothesis (H1):**

  Faculty members have significant satisfaction or dissatisfaction with institutional policies.

4. Academic Environment

- **Null Hypothesis (Ho):**

  Faculty perceptions of the academic environment are not significantly positive or negative.

- **Alternative Hypothesis (H1):**

  Faculty perceptions of the academic environment are significantly positive or negative.

5. Orientation Effectiveness

- **Null Hypothesis (Ho):**

  Faculty members do not perceive the orientation programs to be effective.

- **Alternative Hypothesis (H1):**

  Faculty members perceive the orientation programs to be effective.

6. Overall Satisfaction

- **Null Hypothesis (Ho):**

  There is no significant difference in overall satisfaction among faculty members.

- **Alternative Hypothesis (H1):**

  There is a significant difference in overall satisfaction among faculty members

  These hypotheses will be tested using statistical methods like independent t-tests depending on the data structure and the comparison groups. The outcomes will help determine whether to reject the null hypothesis in favor of the alternative for each factor.

3. SAMPLING SIZE AND TECHNIQUE

- **Target Population:** Faculty members working in private universities in Bhopal, Madhya Pradesh.
- **Sampling Technique:** A **purposive sampling method** was employed to ensure representation across different levels of academic positions (e.g., Assistant Professor, Associate Professor, Professor) with varying years of experience and gender.
- **Sample:** The study's sample comprises 1,413 faculty members drawn from a diverse selection of private universities in Bhopal, Madhya Pradesh. This sample size was carefully determined to balance statistical reliability with practical constraints such as time and available resources. The chosen faculty members represent a broad cross-section of the academic workforce, ensuring that the data captures a wide range of perspectives and experiences.

The survey was conducted among faculty members holding various academic positions (e.g., professors, associate professors, assistant professors, and lecturers). It also accounted for gender diversity and faculty members belonging to different age groups. This stratified sampling approach ensures a comprehensive understanding of faculty perceptions, capturing variations based on hierarchy, gender, and age. The distribution of faculty members based on their positions, gender, and age groups is provided below, detailing the demographic composition of the sample population [9,10]. Figure 3.1. Presents the distribution of sample size on the basis of three criteria position, gender and age group distribution in percentage wise.

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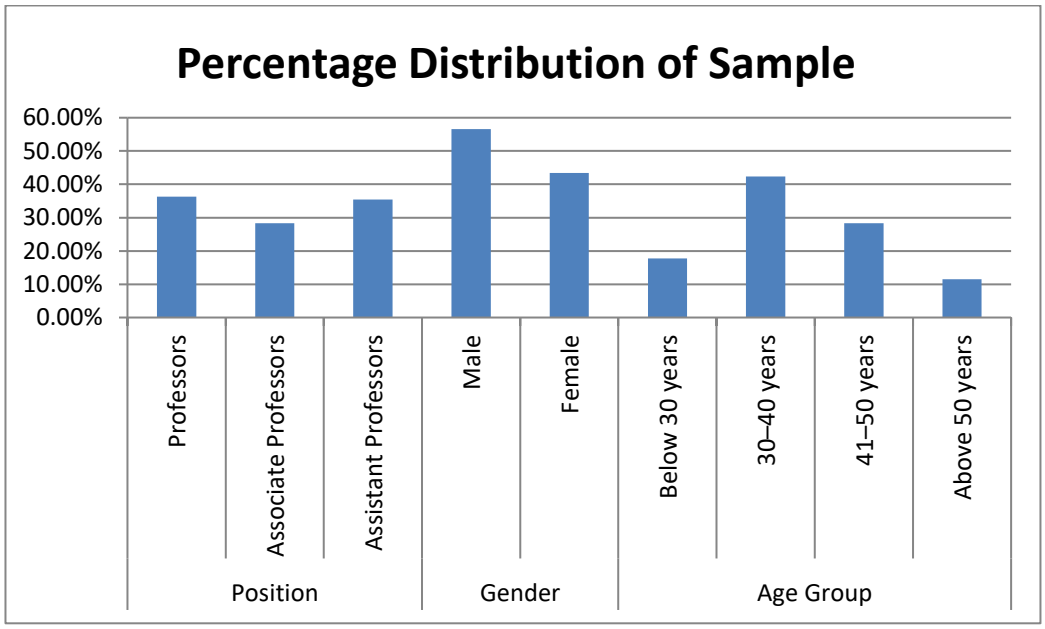

Figure 3.1: Percentage Distribution of Sample

4. FINDINGS & RECOMMENDATION FOR FACULTY DESIGNATION

- **Findings**

The results of the t-test for faculty designation in relation to faculty perceptions were analyzed using the t-statistic and p-value for each faculty category: Professor, Associate Professor, and Assistant Professor. The findings for each designation category are as follows:

1. **Professor:**
   - **T-Statistic Value:** -0.4324
   - **P-Value:** 0.6655
   - The p-value is greater than the commonly accepted significance level of 0.05, indicating that there is no statistically significant difference in faculty perceptions based on the designation of professors. This suggests that the faculty's perceptions, regardless of their designation as professors, do not vary significantly.
2. **Associate Professor:**
   - **T-Statistic Value:** -0.7975
   - **P-Value:** 0.4263
   - Similarly, the p-value for Associate Professors is 0.4263, which is also above the 0.05 threshold. This indicates that faculty perceptions for Associate Professors do not differ significantly based on their designation, implying that their views are relatively uniform.
3. **Assistant Professor:**
   - **T-Statistic Value:** -1.0478
   - **P-Value:** 0.2964
   - The p-value for Assistant Professors is 0.2964, which is also above 0.05. Thus, there is no significant difference in the perceptions of Assistant Professors based on their designation, further confirming the absence of any major perceptual differences between faculty members across different designations.

Based on the t-test results for faculty designation, the p-values for all three faculty categories (Professor, Associate Professor, and Assistant Professor) are greater than 0.05. This leads to the acceptance of the null hypothesis (Ho), which states that there is no significant difference in faculty perceptions based on their designation. Therefore, the analysis suggests that faculty members, regardless of their designation, hold similar perceptions about the various factors assessed in the survey.

Table 5.1 shows the results for the t static value and p value obtained from the python data analysis also the representation of values is represented on figure 5.1. While designation does not significantly affect faculty perceptions in this study, other demographic factors should be explored to ensure that all areas of faculty experience are thoroughly considered in future policy and development initiatives.

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Table 5.1 P-value & t-static Value on the basis of Faculty Designation

Designation	t-static Value	P-Value
Professor	-0.432428651	0.6655157
Associate Professor	-0.797524314	0.4262526
Assistant Professor	-1.047837024	0.2963662

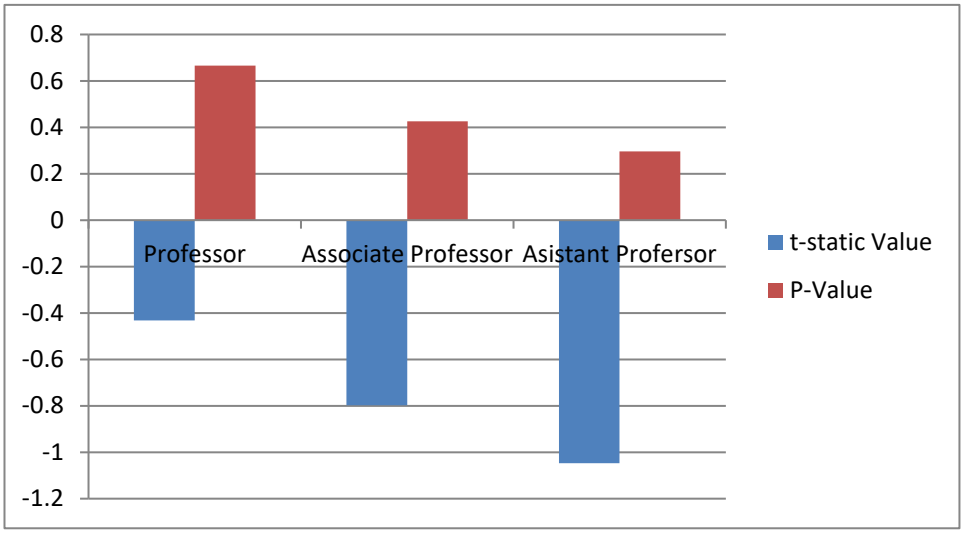

Figure 5.1: - Graphical Representation Statistics Analysis on Designation Basis

5.3. Finding & Recommendations for Gender

- **Findings:**

The results of the t-test for gender-based faculty perceptions were analyzed by examining the t-statistic and p-value for both male and female faculty members. The findings for each gender category are as follows:

1. **Male Faculty:**
   - **T-Statistic Value:** -1.11898
   - **P-Value:** 0.2634
   - The p-value for male faculty is 0.2634, which is greater than the standard significance level of 0.05. This indicates that there is no statistically significant difference in faculty perceptions based on gender for male faculty members. The perceptions of male faculty appear to be consistent across the sample.
2. **Female Faculty:**
   - **T-Statistic Value:** -0.7266
   - **P-Value:** 0.4682
   - Similarly, the p-value for female faculty is 0.4682, which is also above the 0.05 threshold. This result shows that there is no significant difference in the perceptions of female faculty members based on gender. The perceptions of female faculty, like their male counterparts, do not significantly vary according to gender.

Based on the t-test results for gender, the p-values for both male and female faculty are greater than 0.05. Therefore, we fail to reject the null hypothesis (Ho), which suggests that there is no significant difference in faculty perceptions based on gender. This indicates that faculty perceptions are not significantly influenced by gender, and both male and female faculty members share similar perceptions regarding the factors assessed in the survey.

The test results are shown in table 5.2 and the graphical representation is presented in figure 5.2. The findings suggest that gender does not significantly impact faculty perceptions in this study, allowing for more generalized, inclusive approaches to improving faculty engagement and satisfaction at the institution. However, further research into other demographic factors could provide more insights into faculty dynamics.

Table 5.2 P-value & t-static Value on the basis of Gender

Designation	t-static Value	P-Value
Male	-1.1189823	0.26337737
Female	-0.726563	0.46819881

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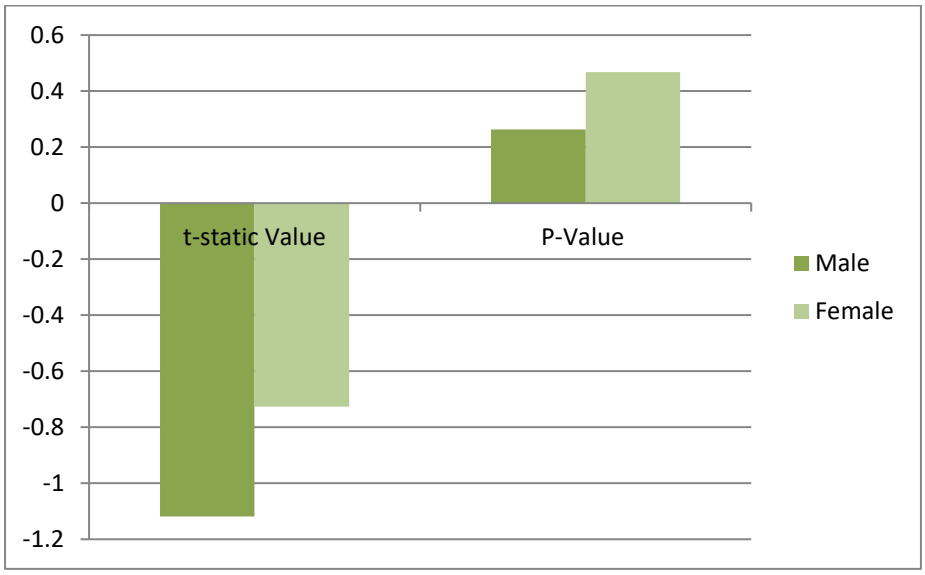

Figure 5.2: - Graphical Representation of Statistics Analysis on Gender Basis

5.4. Finding & Recommendations for Satisfaction with Policy, Academic Environment, and Orientation Effectiveness

5.4.1. Satisfaction with Policies

Findings: The t-test for satisfaction with policies reveals a t-statistic value of 0.2765 and a p-value of 0.7822. Since the p-value is much greater than the standard significance level of 0.05, we fail to reject the null hypothesis (Ho). This indicates that there is no significant difference in faculty satisfaction or dissatisfaction with institutional policies. Faculty members do not report strong levels of satisfaction or dissatisfaction with the policies in place. Faculty perceptions regarding institutional policies are neutral, and the results suggest that faculty are generally neither significantly satisfied nor dissatisfied with the policies in place.

- **Null Hypothesis (Ho):** Faculty members are not significantly satisfied or dissatisfied with institutional policies.
- **Alternative Hypothesis (H1):** Faculty members have significant satisfaction or dissatisfaction with institutional policies.
- **T-Statistic Value:** 0.2765
- **P-Value:** 0.7822

5.4.2. Academic Environment

Findings: The t-test for the academic environment shows a t-statistic value of 1.0296 and a p-value of 0.3034. Given that the p-value is above 0.05, we fail to reject the null hypothesis (Ho). This suggests that faculty perceptions of the academic environment are neither significantly positive nor negative. There appears to be a neutral stance towards the academic environment as perceived by the faculty. Faculty perceptions of the academic environment do not differ significantly from a neutral position. This indicates that, overall, faculty members neither strongly approve nor disapprove of the academic environment in their respective institutions.

- **Null Hypothesis (Ho):** Faculty perceptions of the academic environment are not significantly positive or negative.
- **Alternative Hypothesis (H1):** Faculty perceptions of the academic environment are significantly positive or negative.
- **T-Statistic Value:** 1.0296
- **P-Value:** 0.3034

5.4.3. Orientation Effectiveness

Findings: The t-test for orientation effectiveness yields a t-statistic value of 0.0957 and a p-value of 0.9238. With the p-value significantly greater than 0.05, we fail to reject the null hypothesis (Ho). This indicates that faculty members do not perceive the orientation programs as significantly effective, suggesting a general neutral or low opinion of these programs. Faculty members do not perceive orientation programs as significantly effective. The low level of perceived effectiveness could indicate that the orientation programs are not meeting the expectations or needs of faculty members.

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- **Null Hypothesis (Ho):** Faculty members do not perceive the orientation programs to be effective.
- **Alternative Hypothesis (H1):** Faculty members perceive the orientation programs to be effective.
- **T-Statistic Value:** 0.0957
- **P-Value:** 0.9238

Table 5.3 presents the P-value & t-static value on the basis of satisfaction with policy, academic environment and orientation effectiveness and figure 5.3, figure 5.4 and figure 5.5. presents the graphical representation of test values obtained from python policy satisfaction, orientation effectiveness and academic environment respectively.

Table 5.3: P-value & t-static Value on the basis of Satisfaction with policy, Academic Environment and Orientation Effectiveness

Test Performed	Satisfaction with Policies	Academic Environment	Orientation Effectiveness
t-static Value	0.27647289	1.029605014	0.095651585
P-Value	0.78222534	0.303371791	0.923810867

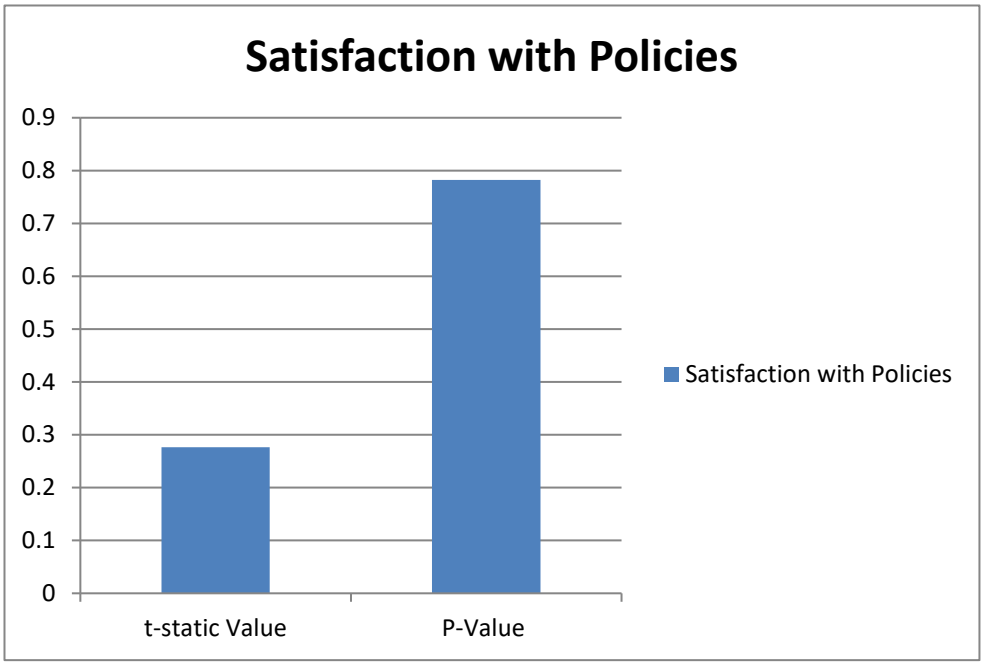

Figure 5.3: - Graphical Representation of Statistics Analysis on Satisfaction with Policy Basis

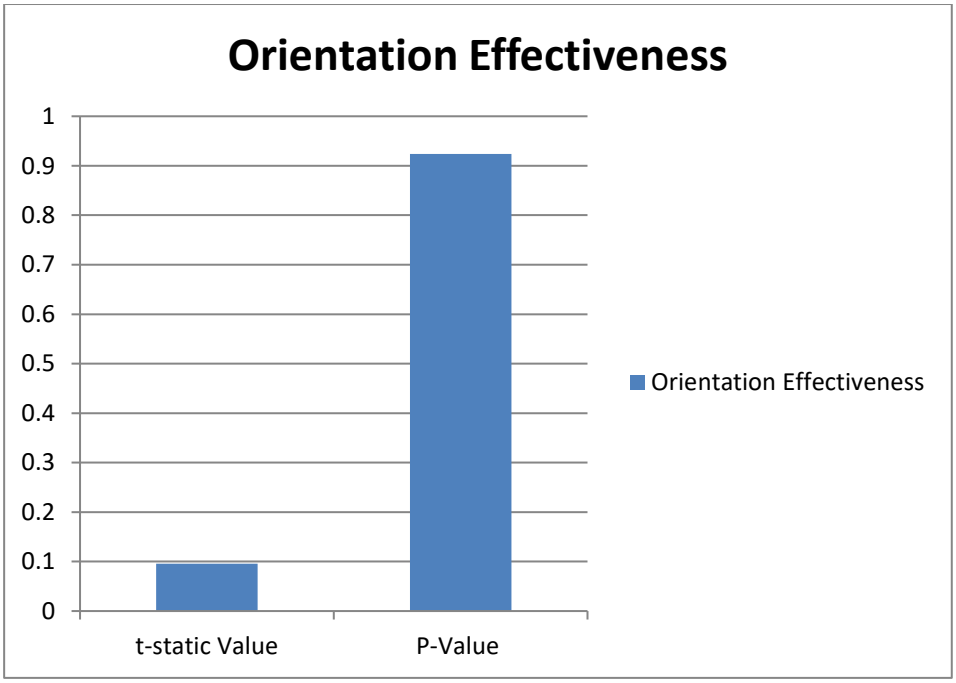

Figure 5.4: - Graphical Representation of Statistics Analysis on Orientation effectiveness Basis

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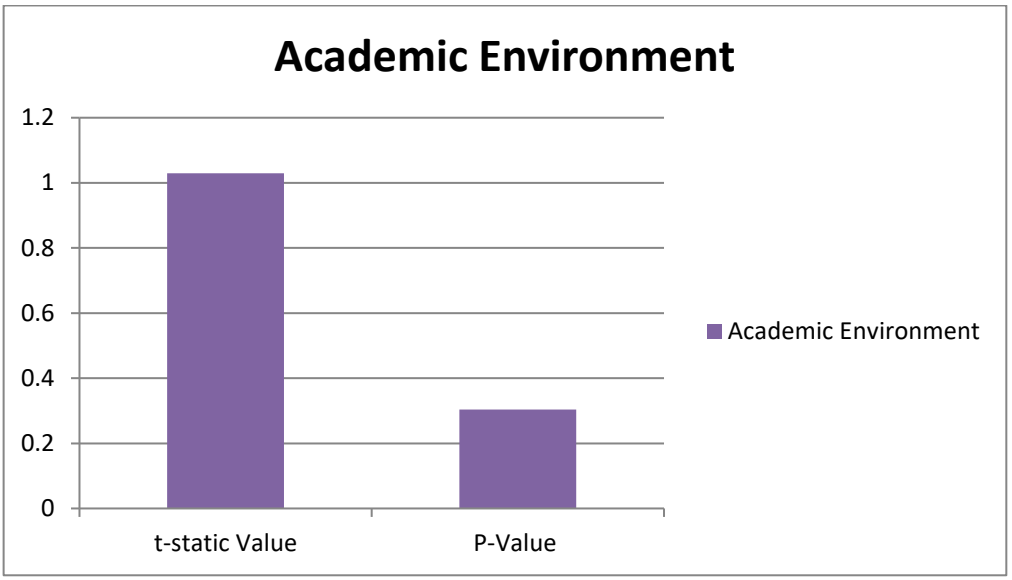

Figure 5.5: - Graphical Representation of Statistics Analysis on Academic Environment Basis

5.4.4. Finding and Recommendations for Overall Satisfaction

The t-test for overall satisfaction yields a t-statistic value of -1.3128 and a p-value of 0.1895. Since the p-value is greater than the commonly used significance level of 0.05, we fail to reject the null hypothesis (Ho). This indicates that there is no statistically significant difference in the overall satisfaction levels among faculty members. The average satisfaction score is 2.9703, which suggests that faculty members' overall satisfaction is slightly below a neutral stance, but it does not indicate a strong trend of dissatisfaction or satisfaction.

The standard deviation of 0.8511 indicates some variability in the responses, which suggests that while the average satisfaction is near neutral, individual faculty members may have diverse opinions on their overall satisfaction with their institutional experiences.

The analysis shows that overall satisfaction among faculty members is not significantly different, with the satisfaction level hovering just below the neutral point (average score of 2.97). The lack of statistical significance (p-value = 0.1895) further suggests that faculty members do not experience a strong collective difference in overall satisfaction. The variability observed (standard deviation of 0.8511) highlights differing opinions among faculty, but no significant patterns emerge to indicate dissatisfaction or satisfaction as a dominant trend.

Thus the overall satisfaction among faculty members does not exhibit significant differences, there is an opportunity to explore specific aspects that may improve satisfaction and foster a more positive and engaging academic environment.

Table 5.4: P-value & t-static Value on the basis of Overall satisfaction

Overall Satisfaction	
Test	**Value**
t Static Value	-1.312835995
P value	0.189451546
Average	2.970276008
Standard Deviation	0.851074805

5. CONCLUSION

This study underscores the importance of addressing faculty perceptions to enhance academic excellence in private universities. By leveraging the insights gained through this research, institutions can create a more supportive and productive environment for their faculty.

The analysis of overall satisfaction among faculty members indicated a slightly below-neutral average satisfaction score (2.97). The p-value of 0.1895 confirmed that there was no statistically significant difference in overall satisfaction. The variability in responses, indicated by the standard deviation of 0.8511, suggests that faculty members hold a range of opinions regarding their satisfaction with the institution. While there is no strong dissatisfaction or satisfaction, the neutral score calls for further efforts to improve the faculty experience, addressing concerns that may contribute to their overall satisfaction.

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