Assessing the Influence of Transformational and Transactional Leadership Styles on the Academic Performance of Engineering Students

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***Abstract*: This study examines the influence of transformational and transactional leadership styles on the academic performance of engineering students at the Nueva Ecija University of Science and Technology (NEUST) Sumacab Campus. Grounded in Bass and Avolio's Full Range Leadership Theory [1], the research utilized a descriptive-correlational design with 150 participants including students, instructors, and alumni. A structured survey was administered, incorporating items from the validated Multifactor Leadership Questionnaire (MLQ) [1]. Results indicated that transformational leadership was predominantly perceived (63.3%) and significantly correlated ($p < 0.05$) with higher GPA ($M = 1.80$, $SD = 0.15$) and greater academic impact. Although present (36.7%), transactional leadership was associated with lower GPA ($M = 2.30$, $SD = 0.25$) and moderate to low academic impact. These findings emphasize the value of integrating transformational traits into faculty development programs to support student performance and engagement.**

***Keywords*: Transformational Leadership, Transactional Leadership, Engineering Education, Academic Performance, NEUST, Leadership Styles, Higher Education.**

1. Introduction

The role of leadership styles in defining academic achievements is primordial across engineering and other similar academic curricula. The Nueva Ecija University of Science and Technology (NEUST) Sumacab Campus provides a useful context in which to explore this dynamic, as it is heavily focused on technological education. The faculty's endowment of leadership styles can have a tremendous impact on students' motivational processes, engagement, and achievement. Nilo et al. [10] supported this by showing that school principals' leadership styles significantly influence teacher job satisfaction, indirectly affecting educational delivery quality. Of the many leadership typologies that may be demonstrated by educators, transformational and transactional leadership are two of the most commonly identified and researched styles. Transformational leadership is described as the capability to inspire, motivate, and intellectually stimulate learners [1]. It focuses on personalized attention, the creation of a shared vision, and the stimulation of creative and critical thinking [2]. This method is especially meaningful within a learning environment that promotes creativity and independent learning.

In contrast, transactional leadership depends on clear structures, prescribed roles, rewards based on performance, and critical feedback [3]. It is a utilitarian outlook that is often privileged in contexts of discipline, efficiency, and obedience—a broad term used in place of the discipline required by, for instance, engineering. The faculty are teachers and mentors. Their leadership affects how students are activated, achieve, and persist in their studies. With the wealth of worldwide literature on educational leadership, there is sparse literature within the Philippine setting, specifically in local engineering education [4]. This study, therefore, attempts to address that gap and provide an empirical perspective to inform organizational policy, teaching practice, and leadership development.

Therefore, this study aims to investigate the impact of transformational and transactional leadership on the scholastic performance of engineering students. By determining which leadership style is most closely associated with better student outcomes, the research will assist educators and administrators in making choices that promote students' success and institutional effectiveness.

2. Review Of Related Literature

Leadership styles in education play an important role in student academic achievement, especially in higher education, such as engineering programs. Bass and Avolio characterized transformational leadership as providing vision, intrinsic motivation, and individualized support, and transactional leadership as being based on structure, tasks, and extrinsic rewards [1]. Leithwood and Jantzi highlighted that transformational leadership leads to increased student involvement and faculty cohesion [5]. Similarly, Dungca [11] found that democratic leadership characteristics are positively correlated with student academic performance, underscoring the vital role of leadership in shaping learning outcomes. On the other hand, transactional leadership may be effective in maintaining order academically [6], but it may have a detrimental impact on creativity and critical thinking [7].

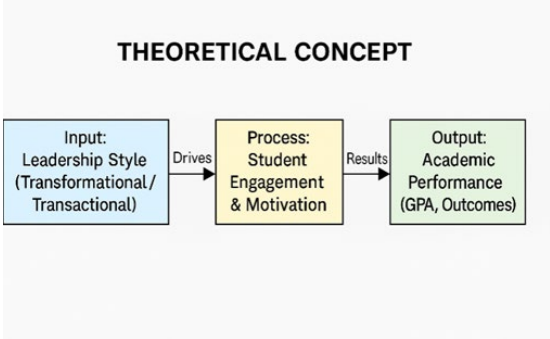
Dungca [11] also noted that leadership styles affect teacher performance, which has a cascading impact on students' academic experience.

In the Philippine academic setting, Catapia and Espinosa noted that transformational leadership results in student satisfaction and academic advancement [4]. However, little formal study has been conducted in local engineering institutions; therefore, it is important to consider how this leadership style influences achievement in technical fields.

In addition to leadership traits, institutional systems also shape educational delivery. Santos et al. [12] recommend the use of digital reporting systems to streamline administrative and facility management tasks, which can support educational leadership and accountability.

3. Conceptual Framework

According to Antonakis and House, this research is underpinned by Bass and Avolio's Full Range Leadership Theory, which assumes that the styles (transformational and transactional) of leadership impact academic achievement among students [8]. The theoretical framework is depicted in the Input-Process-Output (IPO) model:



4. Research Problem

The purpose of this study is to compare the effects of transformational and transactional leadership styles on the academic performance of engineering students at NEUST Sumacab Campus. It particularly tries to answer the following questions:

- What leadership style is predominantly perceived by students, instructors, and alumni?
- What is the academic performance (GPA) of students under different leadership styles?
- Is there a significant relationship between perceived leadership style and academic performance?

A. Significance Of the Study

This research is beneficial to the following stakeholders:

- Students: Informs students of how instructional leadership impacts their educational experiences.
- Educators: Explain how varying styles of leadership can affect student outcomes and encourage reflection and growth.
- Those in Higher Education Administration: Informs leadership training and faculty appraisals.
- Future Researchers: Serves as a foundation for future researchers in the field of leadership and technical education.

B. Scope And Limitation of The Study

This study is limited to the Engineering Department of NEUST Sumacab Campus and involves 150 respondents—students, instructors, and alumni aged 18–50 during A.Y. 2024–2025. It focuses only on transformational and transactional leadership styles. Other factors influencing academic performance (e.g., socio-economic status, personal motivation) are excluded.

C. Research Design

This study utilized a descriptive-correlational research design to assess the influence of transformational and transactional leadership styles on the academic performance of engineering students at NEUST Sumacab Campus. The design was chosen to identify patterns and relationships between leadership perceptions and academic outcomes using both descriptive statistics and correlation analysis.

D. Locale Of the Study

The study was conducted at the Engineering Department of Nueva Ecija University of Science and Technology (NEUST), Sumacab Campus, Cabanatuan City. This location was selected due to its focus on engineering education and accessibility to a target population of students, faculty, and alumni.

E. Sample And Sampling Procedure

A total of 150 respondents were selected using a stratified random sampling technique to ensure balanced representation. The sample included 90 students, 30 instructors, and 30 alumni aged between 18 and 50 years. Each subgroup was proportionally represented based on their population within the department. Stratification ensured diverse perspectives on instructional leadership styles.

F. Respondents Of the Study

The respondents of the study consisted of three groups: 90 current engineering students, 30 engineering faculty members, and 30 alumni who graduated within the last five years. These groups were carefully selected to capture a diverse range of experiences and perspectives on leadership styles as encountered in academic settings over time.

G. Research Instrument

Data were collected using a structured survey questionnaire composed of five sections. The first section covered demographics, including age, gender, and academic role (student, instructor, or alumnus/a). The second section focused on the perception of leadership style, utilizing Likert-scale

items (ranging from 1 = Strongly Disagree to 5 = Strongly Agree) adapted from Bass's Multifactor Leadership Questionnaire (MLQ) to measure both transformational and transactional traits. The third section addressed academic performance through self-reported GPA and perceived academic outcomes. The fourth section evaluated the impact of leadership style by assessing factors such as student motivation, satisfaction, and classroom dynamics. Lastly, the fifth section consisted of open-ended questions designed to gather additional qualitative feedback and insights from respondents.

5. Data Gathering Procedure

The researchers obtained permission from university authorities and distributed the questionnaires both physically and online to ensure wide accessibility. Participation was voluntary and anonymous, and informed consent was secured. A total of 150 valid responses was collected and encoded for analysis.

A. Data Analysis Technique

Data were collected using a structured survey questionnaire composed of five sections. The first section covered demographics, including age, gender, and academic role (student, instructor, or alumnus/a). The second section focused on the perception of leadership style, utilizing Likert-scale items (ranging from 1 = Strongly Disagree to 5 = Strongly Agree) adapted from Bass's Multifactor Leadership Questionnaire (MLQ) to measure both transformational and transactional traits. The third section addressed academic performance through self-reported GPA and perceived academic outcomes, with GPA values interpreted according to the official NEUST GPA scale [9]. The fourth section evaluated the impact of leadership style by assessing factors such as student motivation, satisfaction, and classroom dynamics. Lastly, the fifth section consisted of open-ended questions designed to gather additional qualitative feedback and insights from respondents.

B. Ethical Consideration

The study adhered to the ethical standards outlined in the Data Privacy Act of 2012. All personal data were kept confidential, and participants' identities remained anonymous. Participation was voluntary, and respondents could withdraw at any time. Data were securely stored and used solely for academic purposes.

6. Results And Discussions

Sample Demographics: Among 150 participants, 60% were students, 20% instructors, and 20% alumni. Gender split was 55% male and 45% female. The age range was 18 to 50.

- Prevailing Leadership Style: Transformational leadership was the most perceived style (63.3%).
- Influence on Academic Performance:89% of students under transformational leadership reported a high academic impact, compared to 55% under transactional leadership.
- Academic Performance Comparison: Students influenced by transformational leadership had a mean GPA of 1.80 (SD = 0.15), while those under transactional leadership averaged 2.30 (SD = 0.25). A two-tailed t-test confirmed the significance ($p < 0.05$).

A. Discussion

The results affirm that transformational leadership contributes more significantly to academic success. Traits like intellectual stimulation and personalized support positively impact GPA and classroom engagement. While transactional leadership fosters order, it lacks the same motivational effect.

7. Findings And Conclusions

Transformational leadership was also the most perceived style and was linked to the higher academic performance of the participants. Institutional filing by Attributor Augustdniggle.com. Students subjected to this style of teaching reported higher levels of engagement and motivation, and attendees were academically successful (when measured by results in GPA and qualitative feedback) than their counterparts with more traditional lectures. This is consistent with the view that transformational leadership characteristics, such as individualized consideration and charismatic leadership, may lead to a higher quality student experience at university.

It should be noted, however, that transactional leadership also serves a purpose in organizational structure, consistency, and accountability – leading in technical fields such as engineering where expectations are clear, and getting the job done is key. And that's not to say that one style is empirically better than the other in all situations; the study does not have suggestions that one style is inherently better across the board. Instead, it underscores the potential benefit of a pedagogical climate that supports faculty's choice to combine both orientations according to classroom demands and student qualities.

The results highlight the promise of leadership development programs to support instructors in critically examining and improving teaching practices. Nurturing balanced managerial leadership, academic excellence in differentiated learning can be achieved.

A. Recommendations

Researchers in the future are recommended to extend the present study and extend it to other departments, universities, or academic levels so as to examine the generalization of the outcomes. Added considerations, such as the socio-emotional characteristics of students, how they perceive themselves as learners, and factors related to their outside lives, might offer further information about how styles of leadership combine with success in school. Similar studies contrasting public and private institutions or longitudinal lines of research reflecting the effects of leadership over time could, as well, contribute to an improved understanding of the lasting effects of academic

leadership behaviours. Integration of mixed methods designs or qualitative interviews may complement the interpretation of data and reveal the lived experiences of students, as well as those of the lecturers.

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