

# Engineering Students Perception of Professor Role as a Leader: An Empirical Study

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**Abstract:** Teaching role of an engineering professor has changed from a knowledge imparter to a leadership role. The students emulate the role of a professor. Given individual consideration to engineering college student the professor is considered to influence their performance. It is not enough to be a leader but they have to be a transformational leader. This study focuses on engineering college student's perception about professor's transformational leadership role. Latent variable structural equation modelling was used to test a hypothesis. The results reveal engineering students perceive professor as transformational leader in the professor who gave personalized consideration rather than those maintained contractual relationship.

**Keywords:** Engineering students, Individual consideration, Performance, Transformational leadership.

## I. INTRODUCTION

Professor is an experienced professional who professes with knowledge and intellectual abilities. Engineering college Professor takes assignment of teaching, publishing research articles, interact with industries, and administrative work. They not only possess subject expertise and knowledge, but also inculcate discipline thinking for discussion and practice ethics. The role of Professor is to enhance students' performance and encouraging students for higher learning. The performance of students is a contributing factor in determining whether they perceive an engineering college professor as transformation leader. This article focuses on the perception a Professor as transformational leader.

Johns and Saks [1] define perception as the process of interpreting the information of people's stimulus to provide order and significance to the environment. Literature on measuring perception is grouped under leadership

effectiveness. Criterion used to measure the effectiveness of Professor was engineering college students' grade scores which measures of the leader's effectiveness [2].

Transformational leadership is introduced by seminal work of [3]. The transformational leader communicate the vision of the course to engineering college students [4], recognize a need for change [5], and initiate his/her along with subordinates' behaviour to realise the vision of the firm. S/he motivates followers to achieve high performance standards beyond ordinary expectations [6].

The transformational leader changes low performers to high performers inspiring and empowering students, so that they release more effort and energy [7]. Such a Professor encourages innovation and creativity [8] [9] [10]. The transformational leaders are more effective than transactional leaders in bringing changes in students' performance when there is a close agreement with their academic goals. They are found to be universally effective [6] [11] [12] [13]. Pioneering the concept of transformational leadership [1] and researched by [14] have identified four dimensions of transformational leadership. They are: (a) idealized influence (attribute and behaviour) (b) inspirational motivation, (c) intellectual stimulation, and (d) individualized consideration.

Idealized influence refers to the leaders attributes that the students to emulate. The leader feels trusted, admired, and respected by followers [14]. Leaders, having idealized attributes and behaviour, are found to have profound power and extraordinary influence on students [15]. Idealized behaviour refers to the actions of the leader that transcend beyond self-interest for benefits of the engineering students. The leader develops a sense of collective mission and purpose, and aligns the students' with that mission and purpose.

An intellectually stimulating Professor encourages students' to view the world from new perspectives, that is, they question old assumptions, paradigms, and beliefs. Intellectual stimulation involves challenging students' cognition, generalizations, and stimulating them to seek new ways to do the job. The leader appeals students' intellect by instilling 'problem awareness and problem solving

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capabilities'. Because of intellectual stimulation, followers conceptualize and comprehend the problems they face, solve them, and increase performance.

Inspirational motivation includes motivating engineering college students to do their tasks, leading to higher performance, commitment, and satisfaction [16]. The leader through episodes, dialogues, and various actions takes the followers to a higher plane and they release their efforts accordingly. The leader raises students' expectations and inspires them to achieve their goals. Accordingly, the students' reciprocate.

A leader displaying individualized consideration pays special attention to each student's abilities, aspirations and needs. The leader identifies the deficiencies and removes them through training, education, coaching, and counselling and seeks their participation in goal-setting, decision-making, and problem-solving [16].

A transformational leader possessing idealised behaviour, providing intellectual stimulation, inspirational motivation, and removing the deficiencies among subordinates, empowers and mobilizes the minds of subordinates for higher performance. Therefore, the Professor exhibiting more of these role of transformational leadership, the more will be the engineering students' performance.

## II. THEORETICAL FRAMEWORK

During the past decade there has been a fundamental change in teaching learning methods. Professor is teacher as well as facilitator of class room dynamic knowledge repositories. These changes have realm to new role as leader. All leadership style may not be suitable for engineering college studies. Transformational leadership has four dimensions that are reflected in most professor behavior. Burns [3] described followers and their leaders as inspiring each other to achieve "higher levels of morality and motivation" such as intellectually stimulates subordinates, and pays high attention to individual differences among people [19].

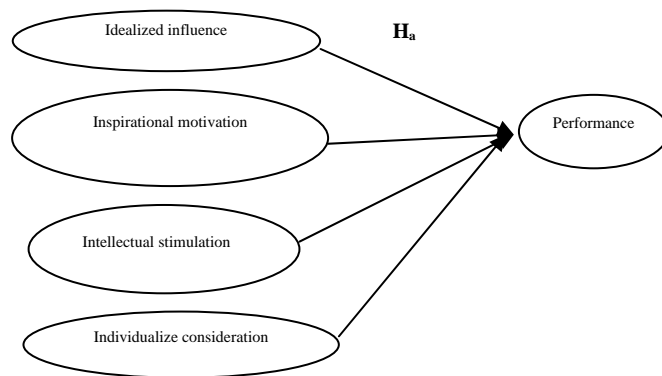
Table I  
SAMPLE PROFILE OF ENGINEERING COLLEGE STUDENTS

Variable	Descriptive statistics	Engineering college students
Age (in years)	<i>M (SD)</i>	19.68 (1.33)
Monthly fathers' income (in thousands of INR <sup>a</sup> )	<i>M (SD)</i>	49,978 (30,120)
Education (years studied)	<i>M (SD)</i>	15.56 (1.48)
Family Size	<i>M (SD)</i>	04.44 (1.32)
Gender		
Male	N (%)	68 (77.30)
Female	N (%)	20 (22.70)

Based on the above theoretical backdrop the following hypotheses are framed.

H<sub>0</sub> Engineering college students do not perceive Professor as transformational leader.

H<sub>a</sub> Engineering college students perceive Professor as transformational leader.



## III. METHOD

### Sample

Data was collected from private deemed engineering college, India where the author is working. Engineering college students studying in third year of engineering stream and second year students attending twinning programme were selected for the questionnaire survey. They were contacted personally. The respondents were briefed about the research objective. Eighty eight students were personally handed over the questionnaire. They were requested to return the questionnaire after ten minutes. When researcher personally approached them all the eighty eight engineering college students returned filled-in questionnaires.

The socio demographic profiles of the two genders are compared with *F* and  $\chi^2$  tests (Table I). Engineering college students' with mean age 19.68 *SD* 1.33, *F* (1, 87) =27.88, *p*<.001. By and large, male and female had nuclear families and differed on the family size, *F* (1, 87) =24.89, *p*<.001. There were proportionally few female students compared to male students among the surveyed group,  $\chi^2(1) = 26.18$ , *p*<.001. They had sufficient years of educational background and family income.

### Measures

Besides the information on socio-demographic variables on age, years of studying, family income, monthly expenses, their Cumulative Grade Point Average (CGPA) score, and years of formal education, data on leadership style of the

professor were collected from engineering college students through the self-reported questionnaire.

Transformational leadership questionnaire-multifactor [14] was used to assess the transformational leadership of the Professor. The scale had four dimensions: (a) idealized influence (attitude and behaviour), (b) inspirational motivation, (c) intellectual stimulation, and (d) individualized consideration. Sample items on (a) idealized influence, include, 'My Professor talks about his/her most important values' and 'My Professor goes beyond self interest for the good of the group', on (b) inspirational motivation, include, 'My Professor talks optimistically about the future' and 'My professor articulates a compelling vision of the future', on (c) intellectual stimulation, include, 'My professor suggests new ways of looking at how to complete assignments', and 'My Professor gets others to look at problems from many different angles', and on (d) individualized consideration, include, 'My Professor helps others to develop their strengths' and 'My Professor spends time teaching and coaching me'. Response descriptions against each item were given on a five-point Likert-type scale ranging from 'strongly disagree' (= 0) to 'strongly agree' (= 4). All items were keyed positively. Higher scores on items of a dimension indicated the more favourable evaluation of that dimension.

#### IV. RESULTS AND DISCUSSION

The performance of engineering college students CGPA was compared professor influence. Pearson correlation was calculated by SPSS 16.0V the results revealed the students perception of professor role as transformation leadership has influence their CGPA grade. The professor was effective in improving their performance.

The constructs was tested by confirmatory factor analysis (CFA) using Amos 16.0 software package [19]. The latent variable structural equation modelling (LVSEM) was adopted to test the hypotheses. LVSEM tests the sequential relationships between a series of independent and dependent variables. It tests the complex models in a single analysis [20]. Moreover, LVSEM unfolds antecedent-consequence relationships that are unreserved in bidirectional correlational analyses. It incorporates measurement models as well as structural models. It controls measurement errors: (a) random and (b) systematic. Random errors occur due to difficulties in measuring the constructs accurately. Random errors of each construct were isolated increasing the fit measures of constructs using confirmatory factor analysis. Systematic errors occur due to factors like social desirability, common method bias (e.g., scale type), and response biases (e.g., leniency).

Transformational leadership dimensions of intellectual stimulation and individualized consideration directly correlated with their CGPA score (performance). Inspirational motivation and idealized influence related directly with their performance. Total score of transformational leadership with performance significantly correlated. Along with descriptive statistics, various fit measures of CFI, GFI, NFI, and RMSEA are given in Table II.

TABLE II  
SCALE RELIABILITY AND VALIDITY

Construct	M	SD	Cronbach $\alpha$	CFI	GFI	NFI	RMSEA	Loading range
<i>Transformational leadership</i>	2.64	0.58	0.93					
(a) Idealized influence								
(b) Inspirational motivation	2.83	0.61	0.77	0.93	0.88	0.92	0.11	0.30-0.98
(c) Intellectual stimulation	2.69	0.66	0.97					
(d) Individualized consideration	2.61	0.55	0.76					

M=MEAN, SD=STANDARD DEVIATION, CFI= COMPARATIVE FIT INDEX, GFI= GOODNESS OF FIT INDEX, NFI= NORMED FIT INDEX, RMSEA= ROOT MEAN SQUARE ERROR OF APPROXIMATION

This study aims to find out engineering college students perception of professor role as transformational leadership. The null hypothesis ( $H_0$ ) is rejected and the alternative hypothesis ( $H_a$ ) is accepted (Table III). This research findings suggest that Professors' working in engineering college has the bigger potential to modify the both the attitude and behaviour of students in increasing their performance.

TABLE III  
INTER-CORRELATION AMONG VARIABLES

	Transformational leadership	Idealised Influence	Inspiration Motivation	Intellectual Stimulating	Individual Consideration
Performance	.58***	.13*	.09*	.48***	.36**

\*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .5$

Results also reveal in LVSM the standardized regression weights of idealized influence, intellectual stimulation, and individualized consideration in the model were significant through their critical ratio of unstandardized regression weights (Table IV) indicate there is significant relationship between the variables under study with effect variable. Whereas inspirational motivation had a inverse influence on their performance.

TABLE IV  
LVSEM RESULTS

		Estimate	S.E	C.R.
Performance	← Idealized influence	.07	.03	2.60**
Performance	← Inspirational motivation	-.04	.04	-.84
Performance	← Intellectual stimulation	.05	.04	1.11*
Performance	← Individualized consideration	.04	.04	1.10*

\*\*\* $p < .001$ , \*\* $p < .01$ ,  $p < .5$ ; S. E=Standard error, C.R.=Critical ratio

The transformational Professor as leader has made the engineering college students more optimistic and enthusiastic. The engineering college students have become confident, driven for higher performance, and courageously took up challenging academic tasks. Professor have enhanced students' effectiveness encouraging them to perform better and elevating them to a higher plane, removing deficiency through proper teaching, training, and counselling; and seeking their participation in class-room discussion, problem-solving, and decision-making. Engineering college students have gained confidence over the subject that could otherwise have upset them. They have withstood challenges posed by parallel academic requirement because the Professor has intellectually stimulated and encouraged students to think critically and to read the subject in different way. In turn students have improved their performance. Professor as transformational leader also created awareness among engineering college students for propelling their performance. This is situation of 'Pygmalion effect' [17][18]. When the professor has intellectually stimulated, individually considered, and influenced those idealized thoughts and expected higher performance from students, the students have performed accordingly.

## V. CONCLUSION

The following conclusions are from the above study:

- Engineering college students' perception of on the role of Professor as transformational leader has significantly influenced their performance.
- Professor has definitely given more individual consideration to boost their confidence as shown in correlation.
- Engineering college students need more intellectually stimulating environment to enhance the performance.
- No research is without limitation, had the sampled data been collected from different segment of engineering background this would give more realistic view.
- Further research can consider the other dimensions of students reading habit, knowledge gained and hard work.
- Structuring staff development program to Professor so that students are inspired and motivated.

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