



Construction and Standardization of the Leadership Effectiveness Scale to Measure the Leadership Effectiveness of Academic Leaders in Universities

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

This study aimed to construct and standardize the Leadership Effectiveness Scale for Academic Leaders in Universities (LESALU). The purpose of the scale is to measure the leadership effectiveness of academic leaders (deans, directors/chairpersons of centres, and heads of departments) on their day-to-day activities based on four dimensions; interpersonal relations, communication skills, emotional stability, and moral strength. A descriptive survey method was employed. The study constructed a scale with 70 items, 38 positive and 32 negative statements. The scale's reliability was estimated by the split-half method which was found to be 0.86, the Explanatory Factor Analysis (EFA) was conducted; the Keiser Meyer Olkin (KMO) measure of

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sampling adequacy was found to be 0.741 and validity was assured through content validity. The Leadership Effectiveness Scale for Academic Leaders in Universities is a valuable tool and its application will lead to good performance for the academic leaders and the university.

Keywords: Leadership effectiveness scale; academic leaders; universities.

1. INTRODUCTION

There are different ways of assessing leadership effectiveness. Leadership effectiveness can be measured by self-perception (self-rating) or followers' perceptions (others' ratings). Different authors have measured leadership effectiveness in different ways: some used self-rating only, other researchers used both self and others' ratings, while others used followers' ratings only. The study by Abu-Tineh (2012), used leaders' self-rating, Versol et al. (1993) used self-rating, Hingar (2006) used self-rating, Meydani et al. (2020) used perceptual evaluation (self-rating), and Fagite (2001) used leaders' self-assessment and others' assessment.

Moreover, Pfaff and Boatwright (2013) used leaders' perceptions and how others perceived them. Gogoi (2018) used teacher's perceptions; Oyinlade (2006) assessed the effectiveness of leaders through the perception of followers. Moreover, Jayasinghe (2020) used employees' perceptions, Pratch and Jacobowitz (1996) used individual evaluation, and Fleenor et al. (1996) used self, subordinate, and superior ratings. The study by Dhar and Pethe (2001) demonstrated that leadership effectiveness can be measured by using subjective ratings of effectiveness which are obtained by ratings from the leader's superiors, peers or subordinates. The current constructed scale will be a self-rating scale.

The study conducted by Abu-Tineh (2012) used leaders' self-rating; other studies (Hingar, 2006; Versol et al., 1993) used self-rating. Moreover, Meydani et al. (2020) used perceptual evaluation (self-rating) and Fagite (2001) used leaders' self-assessment and others' assessment. Furthermore, the study conducted by Pfaff and Boatwright (2013) used leaders' perceptions and how others perceived them; other studies used teachers' perceptions (Gogoi, 2018). Oyinlade (2006) assessed the effectiveness of leaders through the perception of followers. Additionally, Jayasinghe (2020) used employees' perceptions; Pratch and Jacobowitz (1996) used individual evaluation, and Fleenor et al. (1996) used self, subordinate, and superior ratings. Moreover, the study by Dhar and Pethe (2001) reported that

leadership effectiveness can be measured by using subjective ratings of effectiveness which are obtained by ratings from the leader's superiors, peers or subordinates.

There is no universal way of assessing effectiveness in leadership. According to Jerome, et al. (1994), leadership effectiveness can be measured by filtering leaders' behaviors based on the tasks at hand and the leader's attributes. According to Oyinlade (2006), leadership effectiveness is measured using essential behavior leadership qualities rooted in the principles of leadership behaviors theory. According to Dhar and Pethe (2001), leadership effectiveness can be measured by considering how leaders perform tasks successfully and attain organizational goals like increasing sales, productivity, cost per unit output and market share. Lacerda (2015) describes leadership effectiveness can be evaluated by using traits, behaviors, skills and processes; the study also explains that effective leaders are likely to be goal-oriented, skilled in interpersonal communication, confident in themselves, and display particular qualities. According to KekÄle (1998), there is no ideal way to lead, rather, to be effective a leader must possess different attributes depending on the situation.

University academic leaders have visions of how their department, centre, or faculty should be and how to get there. Cooperation between leaders and colleagues is essential for the success of any centre, department, school or faculty. Sometimes, a leader may need changes but fail to accomplish them because of their followers. If the leader is good at interpersonal relations, communication skills, moral strength, and emotional stability, his/her followers will accept changes and, hence, will be effective in leadership; the cooperation of colleagues depends on the effectiveness of the leader's skills and behaviors. According to KekÄle (1998), effective academic leaders use their power wisely and observe laws.

The current study creates a self-rating scale to measure the leadership effectiveness of academic leaders in universities, whereby

academic leaders will measure their leadership effectiveness using a scale called the Leadership Effectiveness Scale for Academic Leaders in Universities. The scale will assess leadership effectiveness based on interpersonal relations, communication skills, emotional stability and moral strength.

2. LITERATURE REVIEW

The literature review is based on studies conducted on the construction and standardization of scales and tools to measure leadership effectiveness.

Jerome, et al. (1994) constructed "The Leadership Effectiveness Index (LEI)" to measure leadership effectiveness. The study used test-retest to determine the reliability which was found to be 0.92 and face validity was used to determine the scale's validity. Gupta (1996) constructed a managerial effectiveness scale that consisted of 16 dimensions with 45 items, the reliability of the scale was 0.73. Dhar and Pethe (2001) constructed a scale known as the Psychological Test: Dhar and Pethe Leadership Effectiveness Scale. The scale consisted of 41 items, the scale determined the reliability by using split-half and was found to be 0.91, and content validity was used to determine the scale's validity.

Kouzes and Posner (2002) used Leadership Practice Inventory (LPI) to measure leadership effectiveness, the tool consisted of 30 items. Rosser, et al. (2003) constructed a multi-level model of leadership effectiveness to measure the leadership effectiveness of deans and directors in universities. The scale included 58 items, reliability was calculated through Cronbach's alpha and found to be 0.9 and content validity was used to determine the scale validity. Hingar (2005) developed a self-rating scale named the leadership behavior scale, with 30 items and a reliability of 0.69. Oyinlade (2006) constructed the Essential Behavioral Leadership Qualities (EBQL) with 18 items. The scale's reliability was determined by using Cronbach's alpha and was found to be 0.92 and validity was determined by face validity. Dhar et al. (2006) developed the managerial effectiveness scale that consisted of 29 items.

Lowder (2007) constructed "A meta-analysis of effective leadership" to measure leadership effectiveness, the scale included 37 items. Taj (2010) designed the Leadership Effectiveness Scale (LES) to measure the leadership

effectiveness of leaders in organizations, the scale included 79 items. The study used content validity to determine the validity of the scale and test retest for reliability which was found to be 0.60. Rahman and Castelli (2013) constructed a leadership effectiveness for business leaders with 21 items, the reliability of the scale was 0.928.

Alhourani (2013) assessed the leadership effectiveness of university deans by using the Multifactor Leadership Questionnaire (MLQ) which consisted of 36 items with a Cronbach alpha of 0.86. Gogoi and Gogoi (2019), constructed the Teachers' Perception Scale on Leadership Effectiveness (TPSLE) to measure the effectiveness of principals by using teacher's perceptions. Their study used content validity to estimate validity and split half to determine reliability which was found to be 0.94.

Through previous literature, the researcher found the presence of several scales and tools to measure leadership effectiveness including the Leadership Effectiveness Index (LEI) developed by Jerome et al. (1994) which was developed to assess leadership effectiveness in vocational colleges. The Leadership Practices Inventory (LPI) by Kouzes and Posner (2002) was specifically for heads of schools, and the Essential Behavioral Leadership Qualities (EBQL) by Oyinlade (2006) was constructed for school principals. Moreover, Gogoi and Gogoi (2019) developed the Teachers' Perception Scale on Leadership Effectiveness (TPSLE) to assess the leadership effectiveness of college principals. Alhourani (2013) developed the Multifactor Leadership Questionnaire (MLQ) to assess the leadership effectiveness of university deans only, while Dhar et al. (2006) developed the Managerial Effectiveness Scale for managers and human resource officers. The Leader Behavior Scale by Hingar (2005) was also for the executives of organizations/institutions. The researcher failed to get a scale suitable to measure the leadership effectiveness of academic leaders, specifically in the positions of deans, heads of departments and directors/chairpersons of centres in the universities. This failure served as the foundation for the current study.

2.1 Objectives

- I. To construct the Leadership Effectiveness Scale for Academic Leaders in Universities.

II. To standardize the Leadership Effectiveness Scale for Academic Leaders in Universities.

country. For the standardization, a sample of 192 academic leaders was included: 92 from India and 100 from Tanzania.

3. METHODOLOGY

The study employed a survey design using the descriptive research method. The study involved the two locations: Assam, India, and Mbeya, Tanzania. Purposive and incidental convenience sampling were used in the study. Purposive sampling was used to get universities and incidental convenience sampling was used to get the academic leaders. In Mbeya, Tanzania, four regions were purposively selected: Mbeya, Iringa, Morogoro, and Dodoma. This selection was based on the availability of a large number of the universities. In India, the study was conducted in Assam state. Assam was also purposively selected because it has 25 universities, which were enough for the scale validation.

The sample of the study included the universities and academic leaders. The researcher selected two kinds of samples, one for tryouts and another for the standardization of the Leadership Effectiveness Scale for academic leaders in universities. For both kinds of samples, the study included 13 universities: 7 from India and 6 from Tanzania. For the tryout, the study involved a sample of 200 academic leaders: 100 from each

4. RESULTS

The analysis of the data was done based on the two objectives of the study.

4.1 Construction of the Leadership Effectiveness Scale for Academic Leaders in Universities

In the process of preparing the scale's draft, the researcher consulted different Leadership Effectiveness Scales and tools that are available, including the following authors who measured leadership effectiveness of leaders by using different dimensions, as the Table 1 shows:

4.2 Dimensions of the Scale

This scale consists of four dimensions of leadership effectiveness: Interpersonal Relations (IR), Communication Skills (CS), Moral Strength (MS) and Emotional Stability (ES). The researcher decided to select four leadership effectiveness dimensions because different authors have used them in measuring leadership effectiveness; hence, they are the most comprehensive.

Table 1. Dimensions of leadership effectiveness from different authors

S/N	Author(s)	Name of the Tool	Dimensions
1.	Rosser, et al. (2003)	Multi-level model of leadership effectiveness	Interpersonal relations, communication skills, management of the unit, diverse, vision and goal setting and quality of education in unity were used to measure leadership effectiveness of deans and directors.
2.	Madanchian & Taherdoost (2019)	Managers' Assessment of Leadership Effectiveness	Measured leadership effectiveness by using the abilities of leaders to inspire, facilitate, and motivate; to be accountable, to have a positive attitude, monitor and ability to influence.
3.	Trivellas & Reklitis (2014)	Competing Values Framework (CVF)	Interpersonal relationships, personal development, fostering innovation, managing the future, energizing employees, controlling the system, coordination and competitiveness.
4.	Dhar et al. (2006)	Managerial Effectiveness Scale	Interpersonal effectiveness, interpersonal effectiveness and functional effectiveness.
5.	Hong et al. (2011)	Managerial Behavior Instrument	Relating to others, enacting change, managing process and producing results.

Table 2. Details of the draft of the scale

Dimensions	Positive and Negative Items	Number in Scale	Total Statements
Interpersonal Relations (IR)	Positive 17	2,5,8,9,11,20,21,23,24,29,30,41,46,47, 60,64 &70	24
	Negative 7	1,22,28,42,61,65 & 66	
Communication Skills (CS)	Positive 11	13,15,27,37,39,49,50,57,58,62 & 63	23
	Negative 12	12,16,25,26,31,32,33,38,40,48,51 & 59	
Emotional Stability	Positive 8	14,17,54,55,67,68,72 &77	16
	Negative 8	6,7,18,19,53,69,71 & 78	
Moral Strength	Positive 11	4,34,35,36,44,52,56,74,76,79 & 81	18
	Negative 7	3,10,43,45,73,75 & 80	
Total	Total Positive= 47 Total Negative= 34		81

Communication skills involve the ability to communicate precisely and effectively. Leaders use communication skills to get staff committed to achieving organizational goals. Through communication skills, leaders build collaboration among colleagues, motivate, encourage and inspire colleagues in achieving their goals.

Interpersonal relations involve interactions or social connections between people. At work, it constitutes the day-to-day interaction between leaders and workers/colleagues. In this scale, interpersonal relations involve the ability of the leader to interact and inspire others to do their best.

Moral strength involves high ethical standards, including respect, honesty, and justice. It involves the ability to act with integrity even in difficult or in the face of opposition. Leaders with positive moral strength show honesty, kindness, and accountability; those with negative moral strength include manipulating situations and favoring others.

Emotional stability involves a person's ability to handle and control emotions. Leaders carry significant role in influencing individuals in organizations; hence, they must have some control over their emotions.

Scoring key: A five-point Likert scale was used: *Strongly Agree, Agree, Undecided, Disagree* and *Strongly Disagree*.

The researcher constructed a scale draft consisting of 79 items covering all four dimensions. After the construction of the draft, the researcher presented the draft of the scale to the experts. The researcher made some corrections through the experts' recommended

inputs. With the corrections made, some items were edited, some were dropped and others were added. Finally, the draft with 81 items was constructed, as Table 2 shows:

4.3 Item Analysis

After the construction of the draft of the scale, the next step was to try the draft scale for item analysis. The tryout was done with 200 academic leaders, 100 from Assam, India and 100 from Tanzania.

After data collection, the researcher calculated the scores of each respondent; then, the scores were arranged in ascending order from highest to lowest score with a total of 200 respondents. Based on scores, 27% of respondents with high scores (54) were taken as the high group and 27% of respondents with low scores (54) were taken as the low group. Hence, a total of 108 respondents were extracted to form two criterion groups (high and low group), followed by computing the t value of each statement. Table 3 shows the t-value of each statement with the following dimensions: IR (interpersonal Relationships), CS (Communication Skills), ES (Emotional Stability) and MS (Moral Stability).

4.4 Item Selection

After calculating the t-value, the items whose t-value was less than 1.75 were cancelled (10 items) and those with a t-value equal to or greater than 1.75 were selected (71); but the researcher planned to retain only 70 items hence item number 2 with the t-value of 2.405626 was also rejected because it is the positive statement with the low t-value among 16 items of interpersonal relations. Table 4 shows the final items selected.

Table 3. The t value of each Item

Item Number	t-value	Category	Dimension	Decision
1	2.501851	Negative	IR	Accepted
2	2.405626	Positive	IR	Accepted
3	3.184453	Negative	MS	Accepted
4	4.907477	Positive	MS	Accepted
5	8.467804	Positive	IR	Accepted
6	4.137677	Negative	ES	Accepted
7	6.123724	Negative	ES	Accepted
8	3.945227	Positive	IR	Accepted
9	3.656552	Positive	IR	Accepted
10	2.950901	Negative	MS	Accepted
11	6.158403	Positive	IR	Accepted
12	4.137677	Negative	CS	Accepted
13	0.42008	Positive	CS	Rejected
14	1.067521	Positive	ES	Rejected
15	2.373551	Positive	CS	Accepted
16	3.592402	Negative	CS	Accepted
17	8.467804	Positive	ES	Accepted
18	5.196152	Negative	ES	Accepted
19	7.484552	Negative	ES	Accepted
20	2.630151	Positive	IR	Accepted
21	6.350853	Positive	IR	Accepted
22	6.735753	Negative	IR	Accepted
23	1.708034	Positive	IR	Rejected
24	3.872983	Positive	IR	Accepted
25	1.521452	Negative	CS	Rejected
26	3.309315	Negative	CS	Accepted
27	9.237604	Positive	CS	Accepted
28.	4.671647	Negative	IR	Accepted
29.	2.738613	Positive	IR	Accepted
30.	8.852704	Positive	IR	Accepted
31.	4.426352	Negative	CS	Accepted
32.	3.335802	Negative	CS	Accepted
33.	4.233902	Negative	CS	Accepted
34.	6.940221	Positive	MS	Accepted
35.	1.708034	Positive	MS	Rejected
36.	0.408248	Positive	MS	Rejected
37.	0.57735	Positive	CS	Rejected
38.	4.354648	Negative	CS	Accepted
39.	4.354648	Positive	CS	Accepted
40.	8.082904	Negative	CS	Accepted
41.	5.965953	Positive	IR	Accepted
42	1.667901	Negative	IR	Rejected
43	9.045154	Negative	MS	Accepted
44	3.464102	Positive	MS	Accepted
45	5.581053	Negative	MS	Accepted
46	3.752777	Positive	IR	Accepted
47	8.852704	Positive	IR	Accepted
48	6.123724	Negative	CS	Accepted
49	8.852704	Positive	CS	Accepted
50	5.325677	Positive	CS	Accepted
51	3.129904	Negative	CS	Accepted
52	5.780765	Positive	MS	Accepted
53	7.120653	Negative	ES	Accepted
54	3.367877	Positive	ES	Accepted

Item Number	t-value	Category	Dimension	Decision
55	5.987642	Positive	ES	Accepted
56	4.522577	Positive	MS	Accepted
57	9.622504	Positive	CS	Accepted
58	9.045154	Positive	CS	Accepted
59	0.730297	Negative	CS	Rejected
60	3.271652	Positive	IR	Accepted
61	6.39589	Negative	IR	Accepted
62	2.963005	Positive	CS	Accepted
63	5.292377	Positive	CS	Accepted
64	9.430054	Positive	IR	Accepted
65	5.307228	Negative	IR	Accepted
66	9.045154	Negative	IR	Accepted
67	5.579393	Positive	ES	Accepted
68	1.549193	Positive	ES	Rejected
69	3.270519	Negative	ES	Accepted
70	3.271652	Positive	IR	Accepted
71	3.464102	Negative	ES	Accepted
72	7.977601	Positive	ES	Accepted
73	3.656552	Negative	MS	Accepted
74	8.660254	Positive	MS	Accepted
75	8.660254	Negative	MS	Accepted
76	9.622504	Positive	MS	Accepted
77	2.455298	Positive	ES	Accepted
78	3.335802	Negative	ES	Accepted
79	7.484552	Positive	MS	Accepted
80	4.150524	Negative	MS	Accepted
81	4.811252	Positive	MS	Accepted

Table 4. Distribution of positive and negative items selected for the final Leadership Effectiveness Scale for academic leaders in universities

Dimension	Positive and Negative Items	Number in Scale	Total Items
Interpersonal Relations (IR)	Positive 14 Negative 7	4,7,8,10,17,18,24,25,33,37,38,50,54 & 59. 1, 19, 20, 23, 51, 55 & 56.	21
Communication Skills (CS)	Positive 9 Negative 10	12, 22, 31, 40, 41, 48,49, 52, & 53 11, 13, 21, 26, 27, 28, 30, 32, 39 & 42	19
Emotional Stability (ES)	Positive 6 Negative 8	14, 45, 46, 57, 63 & 66. 5,6,15, 16,44,58,60 & 67.	14
Moral Strength (MS)	Positive 9 Negative 7	3, 29, 35, 43, 47, 63, 65, 68 & 70. 2, 9, 34, 36, 62, 64 & 69.	16
Total positive statements= 38			70
Total negative statements = 32			

The Table 4 shows the distribution of positive and negative statements included in the final constructed scale (the statements were renumbered from 1 to 70 after omitting the rejected one).

4.5 Standardization of the Leadership Effectiveness Scale for Academic Leaders in Universities

4.5.1 The reliability of the scale

To ensure the scale's reliability, the researcher used the split-half method. The researcher

administered the final draft of the scale to 192 academic leaders from 13 universities in India and Tanzania. After administering the scale, the researcher divided the sets of items into two halves. Then, the researcher calculated the correlation of the coefficient of the two halves using the product-moment correlation coefficient formula. The reliability of the half-scale was found to be 0.75. The next step was calculating the correlation of the coefficient of the full scale using the Spearman-Brown formula which was found to be 0.86. Table 5 shows the reliability process.

Table 5. The reliability of the scale

Method	Sample	Reliability of half-scale	Reliability of full-scale
Split half	192	0.75	0.86

4.6 Explanatory Factor Analysis (EFA)

The EFA was performed using the Principal Component Analysis (PCA) and Varimax rotation. The minimum factor loading criteria set in this study was. The communality of the scale was also assessed to ensure acceptable level of explanation, the result showed that all communalities were over 0.50. Bartlett's Test of Sphericity was used to weight the overall significance of the correlation matrix. The results were significant, the Chi-square was 5231.200 and p-value was 0.000 which was less than 5% level of significant which indicates the suitability for factor analysis. The Keiser Meyer Olkin (KMO) measure of sampling adequacy was found to be 0.741, in this regards data with KMO above 0.6 are considered appropriate for factor analysis. The factor solution delivered from this analysis found 68.58 percent of the variation in the leadership effectiveness scale for academic leaders in universities data.

4.7 The Validity of the Scale

The validity of the scale was ensured through content validity. The researcher sought advice from experts knowledgeable in leadership effectiveness specifically regarding construction and standardization of scale. The scale's draft was given to the number of experts who provided inputs regarding the content coverage and language used. The researchers incorporated all suggestions from the experts. Through their opinions and suggestions, the researcher modified the draft by omitting and adding some items.

5. DISCUSSION

This study aimed to construct and standardize the Leadership Effectiveness Scale to measure the leadership effectiveness of university academic leaders. With regard to the study's findings, the study constructed the final scale with 70 items (38 positive and 32 negative statements). Also, the scale was standardized by calculating its reliability, which was found to be 0.86. The explanatory Factor Analysis (EFA) was conducted, the Keiser Meyer Olkin (KMO) was found to be 0.741 and the scale's validity was assured through content validity. The reliability of

0.86 and the KMO measure of sampling adequacy of 0.741 indicate that the scale is good.

The study constructed the Leadership Effectiveness Scale to measure the leadership effectiveness of university academic leaders with 70 items (38 positive and 32 negative statements). The findings relate to the study by Taj (2010), who constructed the Leadership Effectiveness Scale with 79 statements; 55 were positive and 24 were negative. Also, the study relates to Gogoi and Gogoi (2019), who constructed the Leadership Effectiveness Scale with 60 statements, 39 positive and 21 negative; Rosser et al. (2003) constructed a scale with 58 statements.

This study estimated its reliability through the split-half method. Previous studies, including Dhar and Pethe (2001), and Gogoi and Gogoi (2019) used split-half to calculate their reliability. On the contrary, the studies conducted by Taj (2010) and Jerome et al. (1994) used test-retest; moreover, Oyinlade (2006) and Rosser et al (2003) used Cronbach. In the present study, the researcher found a reliability of 0.86; in comparison with previous studies, Dhar and Pethe (2001) got a reliability of 0.91, Gogoi and Gogoi (2019) found 0.94, Taj (2010) found a reliability of 0.60, Oyinlade (2006) found 0.92, Rosser et al (2003) found 0.9, and Jerome et al. (1994) got the reliability of 0.92. In this study, the scale's validity was assured through content validity. The findings relate to Dhar and Pethe (2001); Gogoi and Gogoi (2019); Rosser et al. (2003); and Taj (2010), whose studies used content validity to determine validity. In contrast, Jerome et al. (1994) and Oyinlade (2006) used face validity to determine the study's validity of the scale.

6. CONCLUSION

This study constructed the Leadership Effectiveness Scale to measure the leadership effectiveness of university academic leaders with 70 items (38 positive and 32 negative statements). Also, the scale was standardized by calculating its reliability, which was found to be 0.86, and the scale's validity was assured by content validity and the Keiser Meyer Olkin

(KMO) was found to be 0.741. The higher reliability and the KMO ensure the accuracy of the scale. The Leadership Effectiveness Scale for Academic Leaders in Universities is a valuable tool and its application will lead to good performance for the academic leaders and the university.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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