Archives of Educational Studies
Vol. 4, No. 2, Dec., 2024, 153-169
ares.pk/ojs/index.php/ares/index

Development and Validation of a Questionnaire for Assessing Transformational Leadership Style

Anam Noshaba[1], Ghazala Noureen[2] & Faiqa Zahra[3]

[1]Assistant Professor, Department of Secondary Education, Lahore College for Women University, Lahore, Pakistan.
E-Mail: anam_pk2006@yahoo.com
[2]Associate Professor, Department of Secondary Education, Lahore College for Women University, Lahore, Pakistan.
[3]Lecturer, Govt. Fatima Jinnah Graduate College for Women, Chuna Mandi, Lahore, Pakistan.

Abstract

Transformational leadership is about bringing change to the organization and its people. This research study aimed to develop a reliable and valid tool to measure the transformational leadership style of leaders in higher education institutions in Pakistan. The process proposed by Kalkbrenner and Gormley was used to develop the scale. A 71-item pool was constructed and refined using experts' reviews. Content validity was ensured by the content validity index. After the content validity index, 32 items were retained. Exploratory factor analysis (EFA) was used to ensure the construct validity of the scale. After EFA, three factors emerged i.e., Charismatic, Visionary, and Challenger, containing 14 items. The confirmatory factor analysis (CFA) confirmed the model fit with 14 items and three subscales; (Charismatic = six items), (Visionary = four items) and (Challenger = four items). Cronbach's Alpha value was 0.93. It is recommended that this tool may be used to collect data regarding transformational leadership styles in the Pakistani context.

Keywords: *Leadership; Transformational Leadership Style; Higher Education Institutions*

Introduction

Concept of transformational leadership has grown incredibly popular among scholars and practitioners over the past 25 years. Transformational leadership is related to transforming people (Harris, 1999). Burns (1978) and Bass (1985) first introduced transformational leadership construct. It is defined by a leader's capacity to communicate a common future vision, engage staff intellectually, and include followers' unique characteristics. In these authors' view, transformational leadership is operationalized into four dimensions which are: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. These factors thus became the basis of the famous Multifactor Leadership Questionnaire (MLQ) and are used to measure transformational leadership style (Brown & Keeping, 2005). The multifactor model originates from research conducted in the late 1980s mainly encompassing contemporary perspectives on leadership.

A common tool for evaluating both transformational and transactional leadership behavior is the MLQ. Nine elements that make up the multifactor leadership questionnaire are highly connected. MLQ got both, approval and disapproval with entitlements to improve the factors reflecting transformational and transactional constructs. One of the major criticisms in the academic literature is lacking validity and reliability in varied contexts (Bajcar & Babiak, 2022). According to Chancy (2017), the multifactor leadership questionnaire ignores the external cultural environment and how it can impact and influence the leadership style a leader would adopt, opponents contend that it lacks validity and reliability as an accurate predictor of leadership effectiveness. Second, it does not have a high level of validity and reliability. Thirdly, it ignores work experience, which has a big influence on leadership style. Fourth, it ignores the influence of interpersonal relationships on leadership style and lastly, it only measures closely related factors rather than distinct factors, therefore, has a very narrow focus.

Kouzes and Posner's leadership model was considered in this study to operationalize the construct of leadership. Nearly 20 years ago, they conducted research and suggested that leadership is more than simply

a job title; it is a set of behaviors and practices. These procedures provided leaders with direction on how to attain their goals or complete remarkable tasks (Abu-Tineh et al, 2009). Following are the five important practices or concepts that were identified by Kouzes and Posner, in the survey, which were deemed essential to meet the challenges and bring change effectively; (i) Challenging the Process; (ii) Inspiring a Shared Vision; (iii) Enable Others to Act; (iv) Modeling the Way and (v) Encouraging the Heart. This study was designed to develop a tool to measure transformational leadership.

Articulate Theoretical Blueprint

Researchers used a theoretical blueprint to ensure the content validity of the measure, which has two main advantages: (a) it helps to define the content and domain areas for the measurement construct, and (b) it assists in figuring out the overall percentage of products that ought to be created in each domain and content area (Menold et al., 2015). The operationalized transformational leadership perspectives used to construct the instrument were proposed by Bennis and Nanus (2007) and Kouzes and Posner (2012). In these two models identified nine factors that contribute to transformational leadership style. A blueprint was made to ensure the content validity is tabulated below:

Table 1

Theoretical Blueprint of Item Development Regarding Transformational Leadership Style (Bennis & Nanus, 2007) and (Kouzes & Posner, 2012)

	Domain Area Transformational Leadership	
Content Areas	Managing Through Communication	10
	Trust Through Positioning	9
	Deployment of Self	6
	Attention Through Vision	7
	Modeling The Way	8
	Inspire The Shared Vision	7
	Challenging The Process	9
	Enable Others to Act	7
	Encouraging the Heart	8

Synthesize Content and Scale Development

Initially, 71 items were developed as shown in Table 1. Five experts made a review for item refinement. Based on their comments and suggestions, 33 statements were retained, some statements were modified and indicators were merged based on their commonalities to meet experts' criteria.

Expert Review for Content Validation

The degree to which test items reflect the entire domain, that it is intended to measure, is known as content validity (MacDermid, 2021). After the first review, five experts (one psychometrician, one subject specialist, and three researchers) were asked for their input on a four-point rating scale for the Content Validity Index. The experts were asked to critically assess the domain and its components, before assigning a score to each item,. In order to improve the items' relevance to the intended build, the experts were also approached for their opinions. The degree of relevance was given as follows: one for items that were not relevant to the measured domain, two for items that were only marginally important to the measured domain, three for items that were moderately relevant to the measured domain, and four for items that were extremely relevant to the measured domain. After revising both, the domain and the items, the experts were asked to use the proper scale to independently award a score to each item.

CVI and S-CVI were calculated using Microsoft Excel 365. Responses on scales one and two were evaluated as zero, whereas scales three and four were rated as 1 to compute CVI. For three to five experts, an I-CVI score of one is appropriate (Polit et al., 2007). Items with I-CVI values below one were excluded from the scale-level CVI/UA analysis. Based on the calculations in Table 2, it can be analyzed that the scale of the questionnaire has attained a reasonable degree of content validity when (S-CVI = 1 and S-UA = 1).

Table 2

Content Validity Index

S/N	Items	*I-CVI*	Experts in Agreement	*UA*
1	My leader speaks thoughtfully during meetings regarding new challenges and opportunities for the institution.	1	5	1

2	My leader is trustworthy in analyzing, changing situations, and making decisions accordingly.	1	5	1
3	My leader remains optimistic in challenging situations.	1	5	1
4	My leader is empathetic towards his/her employees.	1	5	1
5	My leader plans beforehand to achieve targets.	1	5	1
6	My leader is good at finding practical solutions for work-related problems.	1	5	1
7	My leader remains energetic while performing hectic official tasks/assignments.	1	5	1
8	My leader deals with institutional matters in such a way that employees` trust in them.	1	5	1
9	My leader demonstrates first what they expect from me.	1	5	1
10	My leader is an active listener.	1	5	1
11	My leader has excellent presentation skills.	1	5	1
12	My leader negotiates very well.	1	5	1
13	My leader has an impressive writing expression.	1	5	1
14	My leader has a broad and clear vision for the institution's success.	1	5	1
15	My leader starts every task with the end in mind.	1	5	1
16	My leader cares about the institution`s future.	1	5	1
17	My leader`s vision of bringing betterment in society through the institution is my vision.	1	5	1
18	My leader believes in feedback regarding every matter related to the institution`s development.	1	5	1
19	My leader welcomes change.	1	5	1
20	My leader is adaptive to changing situations.	1	5	1
21	My leader believes in adopting innovative techniques for the institution`s success.	1	5	1
22	My leader always looks for new opportunities to increase the institution`s effectiveness.	1	5	1
23	My leader relies on flexible policies to deal with change.	1	5	1
24	My leader welcomes innovative ideas from employees.	1	5	1

25	My leader takes failure as an opportunity to learn new things.	1	5	1
26	My leader is afraid to face the consequences of risky situations.	1	5	1
27	My leader believes in teamwork.	1	5	1
28	My leader ensures all institution`s administration participation in decision-making regarding the implementation of new plans/policies.	1	5	1
29	My leader supports my decision to be successful in the organization.	1	5	1
30	My leader provides me with opportunities to grow.	1	5	1
31	My leader avoids helping me with difficult tasks.	1	5	1
32	My leader gives me rewards/incentives for my success.	1	5	1
S-CVI and S-UA		1	5	1

After the Content Validity Index (CVI), 32 items remained in total. The items in each indicator were, Charismatic (13), Visionary (5), Challenger (8), and Enables Others to Act (6).

Exploratory Factor Analysis

Since EFA is a component of multivariate statistical methods it identified the smallest amount of a factor, sub-construct, or sub-scale that was proposed or assumed to exist. It simply offers an overview of the co-variation between several measured variables. In other words, it involves being conscious of the factors that provide information about the structure and hierarchy of the variables being measured. Factors are seen as invisible personality features of people in the field of social psychology (Tucker & MacCallum, 1997).

Results

Table 3

Item Statistics and Item-Total Correlations of Transformational Leadership Style`s Scale

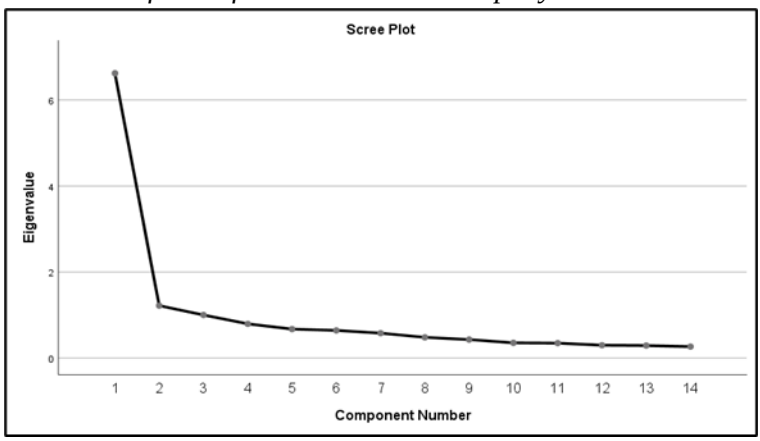
Item No.	Mean (Difficulty Index)	Item-Total Correlation (Discrimination)
01	3.54	0.63
02	3.76	0.66
03	3.64	0.62
04	3.79	0.60

05	3.75	0.66
06	3.75	0.60
07	3.72	0.68
08	3.74	0.66
09	3.81	0.61
10	3.68	0.64
11	3.74	0.61
12	3.73	0.61
13	3.90	0.55
14	3.57	0.43

The column labeled *Item-Total Correlation* in Table 3 above displays correlations between each item and the questionnaire's overall score. Items with item-total correlations higher than 0.3 were kept in the data set. EFA was also performed. Before conducting the EFA, the sample adequacy was confirmed by Kaiser Meyer Olkin (KMO) and Bartlett's test. The df value for the KMO sample was 249, the sample adequacy value was 0.917 and the significance at .000. Both Bartlett's test of sphericity and the value of the KMO test at 0.6 or higher are significant (Pallant, 2011). The data were therefore cleared for factor analysis. Next, the scree plot analysis was used. In the end, three-factor rotations with a cumulative variance value of 55.58 were approved. The factor analysis resulted in the selection of 14 items from a total of 32 items.

Figure 3

Scree Plot of Transformational Leadership Style Scale



For factor analysis, EFA was used. The method of principal component analysis was employed. Rotation was accomplished using the varimax approach. The five and three-factor rotations were used in the factor analysis, and then the best alignment of factors was considered. With

a cumulative variance value of 55.58, three-factor rotations were approved. The factor analysis resulted in the selection of 14 items overall from a total of 32 items. Table 4 lists the factor loading values.

Table 4

Factor Loading for Transformational Leadership Style Scale

Items		*F1*	*F2*	*F3*
		Charismatic	Visionary	Challenger
		Items (06)	Items (04)	Items (04)
1)	My leader speaks thoughtfully during meetings regarding new challenges and opportunities for the institution.	0.78		
2)	My leader is trustworthy in analyzing changing situations and making decisions accordingly.	0.76		
3)	My leader is good at finding practical solutions for work-related problems.	0.65		
4)	My leader remains optimistic in challenging situations.	0.61		
5)	My leader remains energetic while performing hectic official tasks/assignments.	0.60		
6)	My leader believes in teamwork.	0.57		
7)	My leader cares about the institution's future.		0.78	
8)	My leader starts every task with the end in mind.		0.76	
9)	My leader has a broad and clear vision for the institution`s success.		0.69	
10)	My leader plans ~~beforehand~~ to achieve targets.		0.51	
11)	My leader welcomes change.			0.80
12)	My leader is adaptive to changing situations.			0.74
13)	My leader believes in adopting innovative techniques for the institution`s success.			0.67
14)	My leader welcomes innovative ideas from employees.			0.64

Note. ***Values less than < 0.10 are suppressed.

Table 4 shows the conclusion which was based on three variables. With six items in the first factor named "Charismatic", four items in the

second factor labeled "Visionary" and four items in the third factor, which was titled "Challenger".

Table 5

Descriptive Statistics, Reliability Coefficients, Discriminative Validity (mean correlations with other subscales) of Transformational Leadership Style`s Scale

Name of Factor (Sub-Scale)	No. of Items	Mean	Standard Deviation	Cronbach's Alpha	Mean Correlations	Serial number in the final scale
Charismatic	6	22.34	4.74	0.84	0.58	1-6
Visionary	4	15.07	3.52	0.82	0.54	7-10
Challenger	4	14.86	3.44	0.81	0.52	11-14

Table 6

Correlation among all Sub-Scales (Charismatic, Visionary and Challenger) of Transformational Leadership Style Scale (n = 250)

S/N	Sub-Scale	*n*	*M*	*SD*	*1*	*2*	*3*
1	Charismatic	250	22.34	4.74	1	.688**	.637**
2	Visionary	250	15.07	3.52		1	.642**
3	Challenger	250	14.86	3.44			1

** Correlation is significant at the 0.01 level (2-tailed).

Note. *N* = Number of participants, *M* = Mean, *SD* = Standard Deviation, *1* = Charismatic, *2* = Visionary, *3* = Challenger

The correlation coefficient for the sub-constructs of the transformational leadership style scale is shown in Table 6. All have positive relationships with one another, demonstrating the consistency of the scale. This scale is therefore a viable and trustworthy instrument for evaluating transformational leadership style. Ratner (2009) claimed that values in the range of 0.5 to 0.9 show a strong positive linear connection.

Confirmatory Factor Analysis

Another form of factor analysis that is utilized in research is confirmatory factor analysis. Confirmatory Factor Analysis (CFA), enables one to verify whether there is an association between variables or their factors. For CFA, the three components of the transformational

leadership style scale were investigated. Various criteria and indices were used e.g. RMSEA (Root Mean Square Error of Approximation), CFI (Comparative Fit Indices), NFI (Normed fit index), etc. were used to describe the good fit. To interpret RMSEA MacCallum et al. (1996) criteria were used (RMSEA≤ .05). Portella (2012) criteria were used for (NFI > .90). and for CFI >.90 (Bentler, 1990) criteria was used.

Results of CFA

The results of Confirmatory Factor Analysis are given below:

According to Table 7 three factors obtained in EFA were confirmed by confirmatory factor analysis. Results revealed 14 items with three factors i.e., Charismatic, Visionary and Challenger.

Table 7

Fit Indices of CFA for Transformational Leadership Scale

Model	x^2	x^2/df	*CFI*	*TLI*	*IFI*	*ECVI*	*NFI*	*RMSEA*	*SRMR*
3 Factors Solution	2944.48	5.25	.92	.90	.92	1.16	.96	.08	.05

Note. x^2 = Chi Square, *CFI* = Comparative Fit Index, *TLI* = Tucker-lewis Index, *IFI* = Incremental Fit Index, *ECVI* = Expected Cross Validation Index, *NFI* = Normal Fit Index, *RMSEA* = Root Mean Square Error of Approximation, *SRMR* = Standardized root mean square

If the x^2/df value is ≤ 3 it indicates an acceptable fit (Kline, 2014). A CFI value of ≥ 0.90 is considered an excellent fit for the model (Benler, 1990). TLI = Tucker-Lewis coefficient also known as Bentler-Bonett non-normed fit index (NNFI) ranges from zero to one where a value closer to one represents a very good fit while one represents a perfect fit. Incremental Fit Index = IFI where values close to one indicates a very good fit while one indicates a perfect fit (West et al., 2012). Expected Cross Validation Index = ECVI where a smaller value represents a better model fit (Browne & Cudeck, 1993). Normed Fit Index = NFI is considered very good if it is equal to or greater than 0.95, good between 0.9 and 0.95, suffering between 0.8 and 0.9, and bad if it is less than 0.8 (Portela, 2012). Root Mean Square Error of Approximation = RMSEA value ranges ≤ 0.05 indicates reasonable fit (MacCallum et al., 1996). Standardized Root Mean Squared Residual = SRMR value that ranges≤ 0.05 shows an acceptable fit (Siguaw & Diamantopoulos, 2000). All indices were verified with this in consideration, and the results indicated a good model fit for the transformational leadership style scale.

Convergent and Discriminant Validity

Two parameters related to structural equation modeling, convergent, and discriminant validity, were used to evaluate the validity of the questionnaire. The average variance extracted (AVE) factor was used to evaluate the convergent validity, and the AVE square of each structure was compared with the values of the coefficients of correlation between structures to evaluate the discriminant validity. Tables 8 and 9 contain a summary of this information.

Table 8

Summary of Convergent Validity of Study Structures

Latent Variable	Average Variance Extracted (AVE)
Charismatic	0.58
Visionary	0.55
Challenger	0.52

Average Variance Extracted (AVE) acceptability level has a standard value of 0.5 (Hulland, 1999). All AVE values connected to the structures are greater than 0.5, as are presented in the table above, and this value represents that the convergent validity of the existing questionnaire is adequate within this range.

Table 9

Summary of Divergent Validity of Study Structures

Latent Variables	Charismatic	Visionary	Challenger
Charismatic	0.85		
Visionary	0.80	0.84	
Challenger	0.74	0.69	0.72

The model compares the distinction between an index from one structure and an index from another structure in the discriminant validity range. Hair et al. (2017) claimed that it is derived by comparing the AVE square of each structure with the values of the coefficients of correlation between structures. The output of Analysis of Moment Structures (AMOS) revealed that each structure's AVE square was more than the coefficients of correlation between that structure and other structures, demonstrating acceptable divergent validity of the structures presented in Table 9.

Pilot Study

Williams et al. (2010) claimed that a pilot test requires between 50 and 100 participants. For this study, data were collected from 50 faculty members. According to Hulin et al. (2001) reliability value of 0.8 or above indicates a good level of reliability.

Table 10

Reliability Statistics

No. of Items	Cronbach's Alpha Value
14	0.93

Table 10 presents the Cronbach's alpha value. Following confirmatory factor analysis, it demonstrates the scale's overall reliability. The Cronbach's alpha value for this scale was .93, which is generally a sign of good reliability.

Discussion and Recommendations

The development of a scale with reliable psychometric features was the key aim of the current research study. This study was successful in achieving its objective. After the completion of the scale development process following factors are retained in the instrument: (i) Charismatic, (ii) Visionary, and (iii) Challenger. In a nutshell, this study revealed that transformational leaders are charismatic, visionary, and challengers. The

result of the study, that transformational leaders are charismatic, is in line with Joshi (2020) claim that leaders are charismatic. Finding of the study that transformational leaders are visionary is aligned with the study of Stone et al. (2004) who found that transformational leaders are visionary as they always have vision and articulate it in a very efficient manner. Last but not least, research by Carlson and Perrewe (1995), Liontos (1992), Lussier and Achua (2015), and Yukl (1989) supported the finding that transformational leaders are challengers. According to these studies, a transformational leader encourages change by making a compelling argument in favor of it. They are the true innovators and challengers. Based on the findings following recommendations were made:

1. Future researchers are needed to gather data from different organizations in order to improve the generalizability of the instrument as it was administered only in higher education institutions.
2. In order to broaden the scope, future studies must involve multiple sample sizes by employing different sampling techniques.

References

Abu-Tineh, A. M., Khasawneh, S. A., & Omary, A. A. (2009). Kouzes and Posner's transformational leadership model in practice: The case of Jordanian schools. *Journal of Leadership Education, 7*(3), 265-283.

Amanchukwu, R. N., Stanley, G. J., & Ololube, N. P. (2015). A review of leadership theories, principles and styles and their relevance to educational management. *Management, 5*(1), 6-14.

Asad, M. M., Rind, A. A., & Abdulmuhsin, A. A. (2021). Impact of transformational leadership on educational institutes culture: A quantitative study in the context of Pakistan. *International Journal of Organizational Analysis, 30*(5), 1235-1250.

Bajcar, B., & Babiak, J. (2022). Transformational and transactional leadership in the polish organizational context: Validation of the full and short forms of the Multifactor Leadership Questionnaire. *Frontiers in Psychology, 13*, 908594.

Bass, B. M. (1985). *Leadership and performance beyond expectations*. Collier Macmillan.

Bass, B. M., & Avolio, B. J. (1994). Transformational leadership and organizational culture. *The International Journal of Public Administration*, *17*(4), 541-554.

Bennis, W., & Nanus, B. (2007). *Leaders: Strategies for taking charge*, (2nd ed.). Harper.

Benson, J. (1998). Developing a strong program of construct validation: A test anxiety example. *Educational Measurement, Issues and Practice, 17*(1), 10–17.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*(2), 238-246.

Brown, D. J., & Keeping, L. M. (2005). Elaborating the construct of transformational leadership: The role of affect. *The Leadership Quarterly*, *16*(2), 245-272.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Sage.

Burns, J. M. (1978). Leadership. By Burns James MacGregor. *American Political Science Review*, *74*(1), 153-156.

Carlson, D. S., & Perrewe, P. L. (1995). Institutionalization of organizational ethics through transformational leadership. *Journal of Business Ethics*, *14*(1), 829-838.

Chancy, S. (2017). *The Multifactor Leadership Questionnaire (MLQ) as a determinant measure of leadership style.* Ascenditur.

Colbert, A. E., Judge, T. A., Choi, D., & Wang, G. (2012). Assessing the trait theory of leadership using self and observer ratings of personality: The mediating role of contributions to group success. *The Leadership Quarterly*, *23*(4), 670-685.

Fareed, M. Z., Su, Q., & Awan, A. A. (2021). The effect of emotional intelligence, intellectual intelligence and transformational leadership on project success; an empirical study of public projects of Pakistan. *Project Leadership and Society*, *2*(1), 1-10.

Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*. Sage.

Harris, A. (1999). Leadership and School Improvement: What's New?. *Improving Schools*, *2*(3), 10-11.

Heinitz, K., Liepmann, D., & Felfe, J. (2005). Examining the factor structure of the MLQ: Recommendation for a reduced set of factors. *European Journal of Psychological Assessment*, *21*(3), 182-190.

Hulin, C., Netemeyer, R., & Cudeck, R. (2001). Can a reliability coefficient be too high?. *Journal of Consumer Psychology*, *10*(2), 55-58.

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, *20*(2), 195-204.

Joshi, G. (2020). *Charismatic Leaders & innovation: Impact of charismatic leaders on the innovation practices in the companies they start and lead*. (Open research repository). Ontario College of Art & Design University-Canada.

Kalkbrenner, M.T., & Gormley, B. (2020). Development and initial validation of scores on the lifestyle practices and health consciousness inventory (LPHCI). *Measurement and Evaluation in Counseling and Development. 53*(4), 219-237.

Kalsoom, Z., Khan, M. A., & Zubair, D. S. S. (2018). Impact of transactional leadership and transformational leadership on employee performance: A case of FMCG industry of Pakistan. *Industrial Engineering Letters*, *8*(3), 23-30.

Khan, H., Rehmat, M., Butt, T. H., Farooqi, S., & Asim, J. (2020). Impact of transformational leadership on work performance, burnout and social loafing: A mediation model. *Future Business Journal*, *6*(1), 1-13.

Khanzada, B., Naeem, S., & Butt, H. (2018). Impact of transformational leadership on job satisfaction and patient safety outcomes in health sector of Pakistan. *Journal of Health Education Research & Development*, *6*(02), 1-10.

Kline, P. (2014). *An easy guide to factor analysis.* Routledge.

Kouzes, J., & Posner, B. (2012). *The leadership challenge: How to make extraordinary things happen in organizations* (5th ed.). Jossey-Bass.

Liontos, L. B. (1992). Transformational Leadership. *ERIC Digest, 72(1),* 1-23.

Lussier, R. N., & Achua, C. F. (2015). *Leadership: Theory, application, & skill development*. Cengage Learning.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*(2), 130-149.

MacDermid, J. C. (2021). ICF Linking and cognitive interviewing are complementary methods for optimizing content validity of outcome measures: An integrated methods review. *Frontiers in Rehabilitation Sciences, 2*(1), 1-15.

Menold, J., Jablokow, K. W., Purzer, S., Ferguson, D. M., & Ohland, M. W. (2015). Using an instrument blueprint to support the rigorous development of new surveys and assessments in engineering education. In *Annual Conference & Exposition,* 26-1657.

Muenjohn, N., & Armstrong, A. (2008). Evaluating the structural validity of the multifactor leadership questionnaire (MLQ), capturing the leadership factors of transformational-transactional leadership. *Contemporary Management Research, 4*(1) 1-12.

Mvududu, N. H., & Sink, C. A. (2013). Factor analysis in counseling research and practice. *Counseling Outcome Research and Evaluation, 4*(2), 75-98.

Ololube, N. P. (2013). The problems and approaches to educational planning in Nigeria: A theoretical observation. *Mediterranean Journal of Social Sciences, 4*(12), 37-48.

Pallant, J. (2011). Survival manual. *A step by step guide to data analysis using SPSS, 4*(1), 1-4.

Polit, D. F., Beck, C. T., & Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health, 30*(4), 459-467.

Portela, D. M. P. (2012). Contribution of factor analysis techniques to the study of the "scientific occupation of young people on vacation" program. (Unpublished master dissertation). University of Alberta-Canada.

Ratner, B. (2009). The correlation coefficient: Its values range between+ 1/− 1, or do they?. *Journal of Targeting, Measurement and Analysis for Marketing*, *17*(2), 139-142.

Salihu, M. J. (2019). A conceptual analysis of the leadership theories and proposed leadership framework in higher education. *Asian Journal of Education and Social Studies*, *5*(4), 1-6.

Siguaw, J. A., & Diamantopoulos, A. (2000). *Introducing lisrel: A guide for the uninitiated*. Sage.

Stone, A. G., Russell, R. F., & Patterson, K. (2004). Transformational versus servant leadership: A difference in leader focus. *Leadership & Organization Development Journal*, *25*(4), 349-361.

Thibault, T., Gulseren, D. B., & Kelloway, E. K. (2019). The benefits of transformational leadership and transformational leadership training on health and safety outcomes. In R. J. Burke & A. M. Richardsen (Eds.), *Increasing occupational health and safety in workplaces* (pp.334-348). Edward Elgar.

Tucker, L. R., & MacCallum, R. C. (1997). Exploratory factor analysis. *Unpublished manuscript, Ohio State University, Columbus.*

Van Knippenberg, D., & Sitkin, S. B. (2013). A critical assessment of charismatic—transformational leadership research: Back to the drawing board?. *Academy of Management Annals*, *7*(1), 1-60.

West, R. F., Meserve, R. J., & Stanovich, K. E. (2012). Cognitive sophistication does not attenuate the bias blind spot. *Journal of Personality and Social Psychology*, *103*(3), 506-519.

Williams, B., Onsman, A., & Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine*, *8*(1) 1-13.

Yukl, G. (1989). Managerial leadership: A review of theory and research. *Journal of Management*, *15*(2), 251-289.