Vol. 02, Iss. 4 (2025) 225-234, DOI: 10.61552/JSI.2025.04.006

Journal of Sustainable Development Innovations

www.jsi.aspur.rs

Education and Training for Competitive Advantage: The Role of Transformational Leadership and Quality Results

Tryson Yangailo[a,*]

[a]*Independent Researcher, Lusaka, Zambia.*

Keywords:

Education, training, competitive advantage, transformational leadership, quality results, mediation.

* Corresponding author:

Tryson Yangailo
E-mail: ytryson@yahoo.com

Received: 11 December 2024
Revised: 20 January 2025
Accepted: 18 February2025

A B S T R A C T

Education and training are among the most prioritized and adopted activities in organizations. This is because managers understand that the competitiveness and dynamism of the 21st century require their employees to be continuously equipped with knowledge and skills. Although some empirical studies have linked education and training to competitive advantage, very few have included contingency variables to provide more insight into the nature of this relationship. Therefore, this study attempted to include the variables of "transformational leadership" and "quality results" as contingency variables to determine their influence on this relationship, considering that these variables are very critical in today's 21st century. The sample data were collected from 162 managers in TAZARA before being analyzed using Jamovi software. The results indicate that quality results and transformational leadership promote competitive advantage and fully mediate the relationship between education and training and competitive advantage. The results also suggest that the mediating effect of quality results is stronger than that of transformational leadership. Organizations are strongly recommended to integrate quality results into their training and development curricula while adopting a transformational leadership style. This is the first study to empirically test the mediating effect of quality results and transformational leadership on the relationship between education and training, and competitive advantage.

1. INTRODUCTION

The dynamism of the 21st century requires that organizations are constantly adapting to any environmental changes to guarantee their survival and sustain competitiveness. This has made organizations to adopt and implement education and training strategies to explore approaches on how best they can equip their employees with knowledge and skills. On the

other hand, it has also become important for managers at all levels to exhibit their capabilities of how they might influence other employees within their organizations in order to achieve the objectives of their organization [1]. The managers who have influence on enhancing innovation in organizations are described to have transformational type of leadership [2] and assist in enhancing quality in organizations to foster competitiveness [1].

Even though some studies have investigated the nature of the association between education/training and competitive advantage [3-7] there are very few research studies that included contingency variable (s) to comprehend the nature of this relationship. On the other hand, no similar study was previous conducted in the railway sector context. The railway has received little attention where research is concerned [1,8-11]. This study, therefore, attempted to include variables of 'transformational leadership' and 'quality results' as contingency variables to determine their influence on this relationship considering that these variables are very critical in today's dynamic, fierce environment of the 21 st century. There is no previous study that explored the relationship among education and training, transformational leadership, quality results and competitive advantage.

The study developed the following research objectives to address the gaps identified:

- To relate education and training with competitive advantage.
- To determine whether quality results mediate the relationship between education and training, and competitive advantage.
- To determine whether transformational leadership mediates the relationship between education and training, and competitive advantage.

2. LITERATURE REVIEW AND HYPOTHESIS

2.1 Education and Training

Education and training help managers establish a common quality language in an organization and ensure behavioral change and commitment to quality improvement [12]. Education and training improve the knowledge and skills of employees, thereby reducing errors in operations and promoting the competitiveness of the organization [7]. According to Porter [5], employee training, experience and skills are among the most important drivers of differentiation that enable an organization to have a competitive advantage over its competitors. In order to maintain competitiveness, the training process should be a continuous event [13].

2.2 Competitive Advantage

According to Chuck [14], competitive advantage is "providing greater value to customers than rival competitors can" (p.138). The ability of an organization to perform its activities differently is called competitive advantage [15]. "Competitive advantage allows a firm to consistently perform better than its rivals and generate significant profits from the good share of its market" [1].

2.3 Quality Results

Quality results include increased profitability, higher levels of customer satisfaction, reduced costs, and increased loyalty and retention [1]. This element also ensures that production costs and production measures are emphasized together with the evaluation of an employee's success [16].

2.4 Transformational leadership

A transformational leader is creative, innovative, and inspires people to perform at their best in their organization [1]. Transformational leaders usually ensure that their subordinates are able to realize the value of what they are capable of doing. According to Korejan and Shahbazi [17], scholars and theorists believe that the transformational leadership style of management is more effective than the pragmatic type of leadership.

2.5 Education/Training and Competitive Advantage

Denkowska *et al*. [4] examined how formal and non-formal education and training promote competitiveness and innovation in European Member States. The study found a significant positive relationship between education and innovation and competitiveness.

Kamara [3] investigated the effectiveness of training and development on employee performance to enhance competitive advantage in Sierra Leone. The study revealed a significant positive relationship between training and competitiveness.

Sekuloska [6] conducted a study to determine how higher education and training create competitiveness of the nation in Southeast European countries. The results of the study revealed a positive significant relationship between education/training and competitiveness.

A number of other studies have also shown a significant positive relationship between education/training and competitive advantage [5,7].

For this study on the relationship between education/training and competitiveness, the following hypothesis was adopted:

Hypothesis 1: Education and training has a positive significant effect on competitive advantage.

2.6 Education/Training and Quality Results

It is well known that quality results can be achieved through training and education because the components of quality results can only be achieved when an employee is skilled and knowledgeable. "Quality results through quality training and education enhance the skills and knowledge of employees to effectively and efficiently improve teamwork, thereby reducing costs, reducing errors, and increasing job satisfaction, which affect product or/and service innovation" [18]. Based on the literature, the following hypothesis was adopted:

Hypothesis 2: Education and training has a positive significant impact on quality results.

2.7 Education/Training and Transformational Leadership

"Education and training should reinforce basic concepts and skills, but also develop new skills, explore values and beliefs, and enable officers to reach higher levels of professionalism" [19]. Leaders benefit from training and development in the transformational leadership style [20]. This style has been shown to improve performance in organizations. According to Kedir and Geleta [21], it is important to invest resources in leadership development because leadership practices directly affect effectiveness, which is relevant in management. Therefore, it is evident that education/training and transformational leadership are inextricably linked:

Hypothesis 3: Education and training has a positive significant relationship with transformational leadership.

2.8 Quality Results and Competitive Advantage

Organizations strive to survive and maintain their competitiveness by ensuring that they meet the needs and wants of their customers through product and product differentiation [1]. Existing literature has shown that product and/or service quality has a significant positive impact on the competitiveness of organizations [22-26]. Quality has become a prerequisite for achieving competitive advantage in today's dynamic environment [1].

For this research study, based upon literature on the association between quality results and competitive advantage, the following hypothesis was adopted:

Hypothesis 4: Quality results has a positive significant impact on competitive advantage.

2.9 Transformational Leadership and Competitive Advantage

Devie and Hartono [27] examined the impact of transformational leadership on the competitiveness of firms in Indonesia. The study found that transformational leadership has a significant positive impact on competitive advantage.

In Zambia, Yangailo [1] examined the influence of transformational leadership on competitive advantage with key innovations and quality results as mediators. The study found that transformational leadership, quality results, and significant innovations have a positive and significant influence on competitive advantage.

This study adopted the following hypothesis based upon the results presented from previous studies:

Hypothesis 5: Transformational leadership has a positive significant impact on competitive Advantage.

2.10 Conceptual Framework

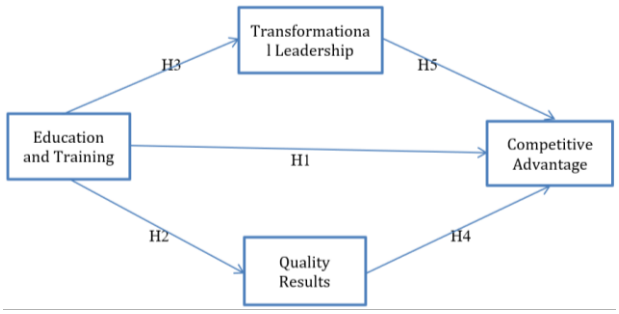

Fig. 1. Hypothesized Model.

2.11 Research Hypotheses

Hypotheses summarized below are based upon the main objective of the study, gained insights from the literature review and a hypothesized model.

- Hypothesis 1: Education and training has a positive significant effect on competitive advantage.
- Hypothesis 2: Education and training has a positive significant impact on quality results.
- Hypothesis 3: Education and training has a positive significant relationship with transformational leadership.
- Hypothesis 4: Quality results has a positive significant impact on competitive advantage.
- Hypothesis 5: Transformational leadership has a positive significant impact on competitive Advantage.
- Hypothesis 6: Quality results has a mediating effect on the relationship between education and training, and competitive advantage.
- Hypothesis 7: Transformational leadership has a mediating effect on the relationship between education and training, and competitive advantage.

3. METHODOLOGY

The Tanzania Zambia Railway Authority (TAZARA) was selected to conduct this study. TAZARA is a two state (Zambia and Tanzania) owned on a fifty-fifty basis and has been in operation since its inception in 1975. A questionnaire was distributed to 197 managers out of a target population of 240. One hundred and sixty two (162) respondents completed and returned the questionnaire. Quantitative research approach was used to analyze the data collected using Jamovi software. Using the Krejcie and Morgan [28] formula to determine sample size, it was determined that the sample size collected was adequate (see Table 1).

Five-point Likert scales were used to measure all constructs, with (5) representing strongly agree and (1) representing strongly disagree. The measures for education and training, transformational leadership, and quality results were adopted from previous studies [16, 29-32]. The measures of competitive advantage were adopted from Berhanu [33] and Hilmy [34].

Table 1. Sample size determination.

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note. —*N* is population size.

4. DATA PRESENTATION AND ANALYSIS

The study employed quantitative research approach using the Jamovi software. The results of the study are presented in descriptive statistics, figures, tables, and the hypothesis tests.

4.1 Response Rate

One hundred and ninety-seven (197) questionnaires were distributed to the primary participants of this study out of a target population of 240. Of the 197 respondents, one hundred and sixty-two (162) completed and returned the questionnaire, representing a response rate of 82.23%.

4.2 Demographic Characteristics

Demographic profile of the 162 respondents who participated in this study based on their gender and experience are presented in Table 2.

Table 2. Demographic Profile.

Description	Frequency	Percentage (%)
Gender		
Male	134	82.7
Female	28	17.3
Total	**162**	**100**
Years-Experience		
< 10	45	27.7
10-20	61	37.7
> 20	56	34.6
Total	**162**	**100**

Of the 162 respondents, 82.7% were male and 17.3% were female. On the aspect of experience with the organization, out of the 162 respondents, 27.7% had less than 10 years of work experience, 37.7% had between 10 and 20 years of experience, and 34.6% were those with more than 20 years of work experience.

4.3 Descriptive Statistics

Mean, standard deviation, kurtosis and skewness for the constructs utilised in this study are presented in Table 3.

Table 3. Mean, Standard Deviation, Skewness and Kurtosis of Constructs (N = 162).

	CA	QR	ET	TL
N	162	162	162	162
Mean	2.88	3.15	2.77	3.06
Median	2.90	3.20	2.75	3.00
Standard deviation	0.752	0.735	0.917	0.841
Minimum	1.00	1.00	1.00	1.00
Maximum	5.00	5.00	4.75	5.00
Skewness	-0.00830	-0.371	-0.0395	0.0753
Std. error skewness	0.191	0.191	0.191	0.191
Kurtosis	-0.00492	0.577	-0.496	-0.0689
Std. error kurtosis	0.379	0.379	0.379	0.379

Source: Survey data

Mean values of the three constructs indicate that respondents favourably responded. Kurtosis and skewness are in the recommended threshold range of –2 to +2 showing no serious deviation from normality for each construct.

4.4 Reliability and Validity

The sample data collected were subjected to reliability and validity tests. The four assumptions that must be met in order to conduct a principal components analysis to obtain validity results are: linear relationship between variables; multiple variables measured either at continuous or ordinal or levels; the adequacy of sampling; no significant outliers. The data from the sample met all four assumptions after verification. The sample used in the study met the recommended minimum of 150 cases required to perform principal component analysis [35].

In order to obtain reliable measures, the reliability test was conducted to determine the good internal consistency and suitability of all the measures used. The Cronbach alpha for all four construct scales were calculated by performing reliability analysis with respect to the recommended threshold of 0.7 [36, 37].

Factorability of the twenty (20) items in the measurement instrument was evaluated and, it was observed that the items correlated at least 0.3 with one other item indicating a reasonable factorability. Kaiser Meyer Olkin measure of sampling adequacy recorded 0.873 above 0.6. The Bartlett's test of sphericity was statistically significant ($\chi 2$ (190) = 1342, $p < .001$). Table 4 presents that the 20 items were suitable based on principal components analysis.

Table 4. Barlett's and Kaiser-Meyer-Olkin Test result.

Bartlett's and KMO Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.873
Bartlett's Test of Sphericity	Approx. Chi-Square	1342
	Degrees of freedom	190
	Significance	<.001

Computed using Jamovi

Cronbach's alpha for the instrument was above the 0.7 threshold [36, 37]. The alpha coefficients for the instrument ranged from 0.777 to 0.825. The alpha coefficient: for the quality results scale was 0.777; for education and training scales was 0.815; for transformational leadership scales was 0.825 and for competitive advantage scales was 0.781. The four Cronbach alpha coefficients met and exceeded the recommended acceptable threshold of 0.7 as shown in Table 5.

Table 5. Cronbach Alpha Test Results.

Items	Cronbach's Alpha	McDonald's Mega	Number of Items	Comment
Overall	.902	.904	20	Accepted
Quality Results	.777	.784	5	Accepted
Transformational Leadership	.825	.831	6	Accepted
Education and Training	.815	.817	4	Accepted
Competitive Advantage	.781	.782	5	Accepted

The relationship between variables is linear. This assumption was checked by the computation of the correlation coefficients as presented on Table 6.

Table 6. Correlation Matrix.

		CA	ET	QR	TL
CA	Pearson's r	—			
	Spearman's rho	—			
	N	—			
ET	Pearson's r	0.306 ***	—		
	Spearman's rho	0.268 ***	—		
	N	162	—		
QR	Pearson's r	0.537 ***	0.593 ***	—	
	Spearman's rho	0.451 ***	0.563 ***	—	
	N	162	162	—	
TL	Pearson's r	0.482 ***	0.466 ***	0.643 ***	—
	Spearman's rho	0.383 ***	0.414 ***	0.583 ***	—
	N	162	162	162	—

Note. * p < .05, ** p < .01, *** p < .001

The results present significant positive correlations among education and training, transformational leadership, quality results and competitive advantage. Education and training, and competitive advantage have positive significant Pearson and Spearman correlation coefficients of 0.306 and 0.268, education and training, and quality results have positive significant Pearson and Spearman correlation coefficients of 0.593 and 0.563, education and training and transformational leadership have positive significant Pearson and Spearman correlation coefficients of 0.466 and 0.414, competitive advantage and quality results have positive significant Pearson and Spearman correlation coefficients of 0.537 and 0.451, competitive advantage and transformational leadership have positive significant Pearson and Spearman correlation coefficients of 0.482 and 0.383, quality results and, transformational leadership have positive significant Pearson and Spearman correlation coefficients of 0.643 and 0.583. All the correlations show that there were below the cut off 0.85 showing that there were no problems of multicollinearity [38].

4.5 Fitness of the Model

The test for regression model was run before estimating the proposed model. Testing of regression models were tested with following hypotheses.

$$H0 : \beta1=\beta2= \beta3 = \beta4 \ldots\ldots\ldots Bi = 0 \quad (1)$$

Ha : One regression coefficients is atleast not equal to zero (2)

Table 7. Summary of Regression Model Fit Measure.

Model		R	R^2	Adjusted R^2	Overall Model Test F	Overall Model Test P
1	ET predicting CA	0.306	0.0936	0.0880	16.5	< .001
2	QR predicting CA	0.537	0.288	0.283	64.7	<. .001
3	ET predicting QR	0.593	0.351	0.347	86.6	< .001
4	TL predicting CA	0.482	0.232	0.227	48.4	< .001

ET = Education and Training

TL=Transformational Leadership

Quality Results

CA= Competitive Advantage

Computed using Jamovi

Table 7 shows that there were significant relationships between the constructs based on the regression analyses conducted. The first model that shows the proposed effect of education and training on competitive advantage shows a good fit and significant values of R(0.306), R^2(0.0936) and a significant F-value of 16.5. This indicates that education and training explain 9.4% of the variation in competitive advantage. The second model, which shows the proposed impact of quality results on competitive advantage, shows a good fit and significant values of R (0.537), R^2(0.288) and a significant F-value of 64.7. This indicates that quality results explain 28.8% of the variation in competitive advantage. The model suggesting the effect of education and training on quality results

shows a good fit and significant values of R (0.593), R^2(0.351) and significant F-value of 86.6. This shows that education and training explain 35% of the variation in quality results. The model suggesting that transformational leadership has an impact on competitive advantage showed a good fit and values that are significant of R (0.482), R^2(0.232) and significant F-value of 48.4. This indicates that transformational leadership explains 23% of the variation in competitive advantage.

4.6 Hypotheses Testing and Results

This study undertook seven hypotheses regarding the direct relationship and the indirect effect (mediating effect). Tables 8 and 9 show the results of the tested hypotheses.

Table 8. Indirect and Total Effects.

				95% C.I. (a)				
Type	Effect	Estimate	SE	Lower	Upper	β	z	p
Indirect	ET ⇒ QR ⇒ CA	0.2000	0.0503	0.1014	0.2986	0.2438	3.975	<.001
	ET ⇒ TL ⇒ CA	0.0919	0.0354	0.0226	0.1611	0.1120	2.598	0.009
Component	ET ⇒ QR	0.4749	0.0507	0.3755	0.5743	0.5926	9.363	<.001
	QR ⇒ CA	0.4210	0.0959	0.2331	0.6090	0.4114	4.390	<.001
	ET ⇒ TL	0.4271	0.0638	0.3022	0.5521	0.4657	6.699	<.001
	TL ⇒ CA	0.2150	0.0763	0.0655	0.3646	0.2405	2.819	0.005
Direct	ET ⇒ CA	-0.0408	0.0665	-0.1712	0.0896	-0.0498	-0.614	0.539
Total	ET ⇒ CA	0.2510	0.0615	0.1304	0.3716	0.3060	4.078	<.001

Note. Confidence intervals computed with method: Standard (Delta method)
Note. Betas are completely standardized effect sizes

Computed using Jamovi

The model path coefficients of this study and the significance results are shown in Tables 8 and 9. The relationships and effects hypothesized in this research study were all supported. Hypothesis 1, which is an overall effect of education and training on competitive advantage, shows that it is positively significant ($\gamma = 0.2510$, $p<0.001$), so H1 is supported. However, when both transformational leadership and quality results are mediated, the direct effect becomes insignificant, which means that full mediation has taken place ($\gamma = -0.0408$, $p=.539$). Education and training has a positive significant effect on quality results ($\gamma = 0.4749$, $p< .001$), thus supporting H2. Education and training has a positive significant relationship with transformational leadership ($\gamma = 0.4271$, $p< .001$), thus supporting H3. Quality results has a positive significant effect on competitive advantage ($\gamma = 0.4210$, $p< .001$), therefore H4 is supported. Transformational leadership has a positive significant impact on competitive advantage ($\gamma = 0.2150$, $p< .05$), therefore H5 is supported.

Table 9. Hypothesis Summary.

No	Hypothesis	Results
1.	Hypothesis 1: Education and training has a positive significant effect on competitive advantage.	Supported
2.	Hypothesis 2: Education and training has a positive significant impact on quality results.	Supported
3.	Hypothesis 3: Education and training has a positive significant relationship with transformational leadership.	Supported
4.	Hypothesis 4: Quality results has a positive significant impact on competitive advantage	Supported
5.	Hypothesis 5: Transformational leadership has a positive significant impact on competitive Advantage.	Supported
6.	Hypothesis 6: Quality results has a mediating effect on the relationship between education and training, and competitive advantage.	Supported

The indirect effect of education and training on competitive advantage through quality results shows a positive and statistically significant ($p<0.001$, $\gamma = 0.2000$; ratio effect = 0.7968). This shows a partial mediation effect of quality results, which supports Hypothesis 6.

The indirect effect of education and training on competitive advantage through transformational leadership shows a positive statistically significant ($p=0.009$, $\gamma = 0.0919$; ratio effect = 0.3661). This also shows a partial mediation effect of transformational leadership, thus supporting Hypothesis 7.

The model has shown that the two mediators (quality results and transformational leadership) fully mediate the relationship between education and training and competitive advantage. This is evident from the insignificance of the direct effect of training on competitive advantage (direct effect ($p=0.539$, $\gamma = -0.0408$, 95% CI: [-0.1712, 0.0896]).

5. DISCUSSION

The results provide a strong support for the theoretical model of the relationship among education and training, quality results, transformational leadership, and competitive advantage. The results indicate that most managers in TAZARA are male and that employees in management with 10 to 20 years of work experience are the majority.

To investigate if education and training has a positive significant effect on competitive advantage, the study confirms and support previous studies that have presented that education/training has a positive significant

effect on competitive advantage [3-7]. The results of the study also show that education and training has a positive significant impact on quality results. This is consistent with Yangailo [18] who presented that education and training have a positive significant impact on quality results.

To determine whether education and training has a positive significant relationship with transformational leadership. The results of this study confirm and support previous studies that presented that education and training has a positive significant relationship with transformational leadership [19-21].

The results also reveal that quality results has a positive significant impact on competitive advantage. This is consistent with previous studies that presented the same results [22-26].

To determine whether transformational leadership has a positive significant impact on competitive advantage, this study proved that transformational leadership has a positive significant impact on competitive advantage. This finding is consistent with some previous studies that also found that transformational leadership fosters competitive advantage [1, 27].

This study also investigated whether quality results has a mediating effect on the relationship between education and training, and competitive advantage. The results of this study reveal that quality results partially mediate the association between education and training, and competitive advantage. This is a major contribution to the literature as there hasn't been any study that empirically tested this association using quality results as a mediating variable.

The study also investigated whether transformational leadership has a mediating effect on the relationship between education and training, and competitive advantage. The findings of this study reveal that transformational leadership partially mediates the association between education and training, and competitive advantage. This is also a major contribution to literature as there hasn't been any study that empirically tested this association using transformational leadership as a mediating variable.

The study has empirically revealed that quality results and transformational leadership promote competitive advantage, although quality results has a greater mediating effect compared to transformational leadership.

6. CONCLUSION

The study is the first to examine the association among education and training, quality results, transformational leadership, and competitive advantage. The results reveal that education and training has an impact on quality results, transformational leadership and competitive advantage, and that both transformational leadership and quality results completely mediate the association between education and training, and competitive advantage. This study contributes towards a good understanding of the association between education and training, and competitive advantage by further including mediating variables. Thus, integrating quality results in curricula of training and development of organizations while adopting transformational type of leadership style is the only way to attain and sustain competitiveness in today's dynamic environment.

This study focused on TAZARA, thereby narrowing the generalization of the study results. It is therefore recommended that replication of this study be conducted in other sectors.

Acknowledgement

I would like to express my sincere gratitude to the editor and reviewers for reviewing the paper.

REFERENCES

[1] T. Yangailo, "Assessing the influence of transformational leadership on competitive advantage through important innovations and quality results: Case of railway industry," *Manage. Sci. Lett.*, vol. 13, no. 1, pp. 41–50, 2023.

[2] B. M. Bass and B. J. Avolio, Eds., *Improving Organizational Effectiveness Through Transformational Leadership*. Sage, 1994.

[3] M. Kamara, *The Effectiveness of Training and Development on Employee Performance to Enhance Competitive Advantage: A Case Study of Social Enterprise Development Sierra Leone (Send-SL)*. Universitas Muhammadiyah Malang, 2022.

[4] S. Denkowska, K. Fijorek, and G. Węgrzyn, "Formal and non-formal education and training as an instrument fostering innovation and competitiveness in EU member countries," *J. Competitiveness*, vol. 12, no. 3, 2020.

[5] M. E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance*. Simon and Schuster, 2008.

[6] J. D. Sekuloska, "Higher education and training as crucial pillars in creating the competitiveness of nation," *Procedia-Soc. Behav. Sci.*, vol. 156, pp. 241–246, 2014.

[7] Hamburg, "Improving education and training impact on competitive advantages in SMEs," *Int. J. Innov. Res. Electron. Commun.*, vol. 1, pp. 54–60, 2014.

[8] M. Kaunda and T. Yangailo, "Motivation on employee performance through top leadership commitment," *Int. J. Manage. Knowl. Learn.*, vol. 12, 2023.

[9] F. Talib and Z. Rahman, "Studying the impact of total quality management in service industries," *Int. J. Product. Qual. Manage.*, vol. 6, no. 2, pp. 249–268, 2010.

[10] D. G. Janelle and M. Beuthe, "Globalization and research issues in transportation," *J. Transp. Geogr.*, vol. 5, no. 3, pp. 199–206, 1997.

[11] T. Yangailo, "Linking customer focus and competitive advantage: The mediation of transformational leadership," *Int. J. Manage. Knowl. Learn.*, vol. 12, 2023.

[12] M. Mosadeghrad, "Essentials of total quality management: A meta-analysis," *Int. J. Health Care Qual. Assurance*, vol. 27, no. 6, pp. 544–558, 2014, doi: 10.1108/IJHCQA-07-2013-0082.

[13] S. K. Singh, J. Chen, M. Del Giudice, and A. N. El-Kassar, "Environmental ethics, environmental performance, and competitive advantage: role of environmental training," *Technol. Forecast. Soc. Change*, vol. 146, pp. 203–211, 2019.

[14] W. Chuck, *Effective Management*. Texas Christian University, 2006.

[15] P. Kotler, *Marketing Management*. Prentice Hall, 2000.

[16] C. L. Ang, M. Davies, and P. N. Finlay, "Measures to assess the impact of information technology on quality management," *Int. J. Qual. Reliab. Manage.*, vol. 17, no. 1, pp. 42–66, 2000.

[17] M. M. Korejan and H. Shahbazi, "An analysis of the transformational leadership theory," *J. Fundam. Appl. Sci.*, vol. 8, no. 3, pp. 452–461, 2016.

[18] T. Yangailo, "The mediating and moderating effect of total quality management practices on the association between strategic planning and competitive advantage: The case of railway sector," *Int. J. Product. Qual. Manage.*, vol. 40, no. 4, pp. 491–511, 2023.

[19] R. Bynum, "Transformational leadership and staff training in the law enforcement profession," *Police Chief*, vol. 75, no. 2, pp. 72, 2008.

[20] M. Anderson, "Transformational leadership in education: A review of existing literature," *Int. Soc. Sci. Rev.*, vol. 93, no. 1, pp. 1–13, 2017.

[21] K. Kedir and A. Geleta, "Leading educational change: The practices of transformational leadership in the Ethiopian Technical Vocational Education and Training (TVET) institutions," *Online Submiss.*, vol. 9, no. 5, pp. 46–61, 2017.

[22] T. Yangailo, "The impact of quality results and important innovation as TQM practices on organisational productivity: The case of railway sector," *Proc. Eng. Sci.*, vol. 4, no. 3, pp. 327–336, 2022, doi: 10.24874/PES04.03.010.

[23] C. R. Gowen III, K. L. McFadden, and W. J. Tallon, "On the centrality of strategic human resource management for healthcare quality results and competitive advantage," *J. Manage. Dev.*, vol. 25, no. 8, pp. 806–826, 2006, doi: 10.1108/02621710610684277.

[24] Gremyr, M. Elg, A. Hellström, J. Martin, and L. Witell, "The roles of quality departments and their influence on business results," *Total Qual. Manage. Bus. Excellence*, vol. 32, no. 7–8, pp. 886–897, 2021.

[25] K. M. Warraich, I. A. Warraich, and M. Asif, "Achieving sustainable competitive advantage through service quality: An analysis of Pakistan's telecom sector," *Glob. J. Manage. Bus. Res.*, vol. 13, no. 2, pp. 1–10, 2013.

[26] M. Inhofe Rapert and B. M. Wren, "Service quality as a competitive opportunity," *J. Serv. Market.*, vol. 12, no. 3, pp. 223–235, 1998, doi: 10.1108/08876049810219539.

[27] D. Devie and C. A. Hartono, "The impacts of transformational leadership on competitive advantage of local accounting firms," *J. Econ. Bus.*, vol. 1, no. 4, pp. 524–541, 2018.

[28] R. V. Krejcie and D. W. Morgan, "Determining sample size for research activities," *Educ. Psychol. Meas.*, vol. 30, pp. 607–610, 1970, doi: 10.1177/001316447003000308.

[29] L. J. Porter and A. J. Parker, "Total quality management—the critical success factors," *Total Qual. Manage.*, vol. 4, no. 1, pp. 13–22, 1993.

[30] S. S. Rao, L. E. Solis, and T. S. Raghunathan, "A framework for international quality management research: Development and validation of a measurement instrument," *Total Qual. Manage.*, vol. 10, no. 7, pp. 1047–1075, 1999.

[31] L. S. M. D. L. Wai, A. K. Seebaluck, and V. Teeroovengadum, "Impact of information technology on quality management dimensions and its implications," *Eur. Bus. Rev.*, vol. 23, no. 6, pp. 592–608, 2011, doi: 10.1108/09555341111175426.

[32] E. Bayraktar, E. Tatoglu, and S. Zaim, "An instrument for measuring the critical factors of TQM in Turkish higher education," *Total Qual. Manage.*, vol. 19, no. 6, pp. 551–574, 2008.

[33] N. Berhanu, *Total Quality Management (TQM), Competitive Advantage and Ownership in Ethiopian Construction Sector*. Addis Ababa University, 2019.

[34] M. Hilmy, *Effect of Total Quality Management Practices on Competitive Advantage of Transport and Logistics Firms in Mombasa County, Kenya*. University of Nairobi, 2016.

[35] K. Fan, C. O'Sullivan, A. Brabazon, and M. O'Neill, "Non-linear principal component analysis of the implied volatility smile using a quantum-inspired evolutionary algorithm," *Nat. Comput. Comput. Finance*, pp. 89–107, 2008.

[36] J. D. Nunnally, *Psychometric Theory*, 2nd ed. New York: McGraw-Hill, 1978.

[37] J. F. Hair, W. C. Black, B. J. Babin, R. E. Anderson, and R. L. Tatham, *Structural Equation Modeling: An Introduction*, 6th ed. Upper Saddle River, NJ: Pearson Prentice Hall, 2006, pp. 752–753.

[38] J. F. Hair, W. C. Black, B. J. Babin, and R. E. Anderson, *Canonical Correlation: A Supplement to Multivariate Data Analysis*. Upper Saddle River, NJ: Pearson Prentice Hall, 2010.