
The Relationships between Leadership Attributes, Behaviours and the Effectiveness of Principals at Private Vocational High Schools in Taiwan

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This study examines the relationships between leadership attributes, behaviours and effectiveness of principals at private vocational high schools in Taiwan. The study was designed to contribute to an understanding of the types of leadership behaviours that are conducive to effective performance and the attributes that predispose those behaviours. The sample consisted of 1,528 subjects, drawn from private vocational high school teachers across Taiwan. As measured by the *Multifactor Leadership Questionnaire*, the four transformational behaviour factors of charisma, intellectual stimulation, individualised consideration and inspiration were highly and positively related to perceived overall leader effectiveness. The transactional factor of contingent reward had a mid-range correlation with perceived overall effectiveness. The transactional behaviour factor of management by exception had the lowest positive correlation with perceived overall effectiveness. The non-leadership behaviour factor of laissez-faire had a lower but negative correlation with perceived effectiveness. As measured by the *Leader Attributes Inventory*, all 35 leadership attributes were strongly and significantly related to perceived overall leader effectiveness.

INTRODUCTION

There are almost as many different definitions of leadership as there are persons who have tried to conclude the concepts; many of the definitions are not rigor. Leadership may be defined as a focus of group processes, the art of inducing compliance, the exercise of influence, an act of behaviour, a persuasion, a power relation, an instrument of goal achievement, an emerging effect of interaction, a differentiated role, the initiation of structure, and so on [1].

The economic, technological, demographic and educational context in which vocational education is practiced is changing [2]. These changes and their potential impacts upon vocational education are significant. Consequently, vocational education has been challenged to provide more basic skills, science and mathematics, social science, computer science and critical thinking skills in its programmes [2]. Vocational education must adjust its role and function in order to remain viable in the changing environment.

On the other hand, all 102 private vocational high schools are suffering from a decreasing student population. Most of them plan to transform into comprehensive high schools if their performance achieves those standards established by the Department of Education in Taiwan [3]. Leadership becomes extremely important to organisations in unstable situations. Therefore, it is critical to note that the future effectiveness of vocational education, *its ability to adapt constructively to its changing context*, rests to a large degree upon the quality of leadership in the field [4].

The Leadership of Principals

Effective leadership for principals of private vocational high schools is vital in this era of transition to an informational and technological age. This is because organisational examinations, regarding objectives, structure, clarity and climate, become important during the transition period [5].

Arcy has indicated that an administrator must skilfully utilise leadership abilities in establishing and maintaining viable and progressive educational programmes [6]. Lutz has also pointed out that due to the vast changes in human expectations and needs, as well as rapidly changing technology, vocational education requires efficient and effective leaders as never before [7]. Moreover, most people in the area of vocational education believed that vocational education urgently needs astute and creative leaders at all levels in order to adapt to changes.

However, little is known about how to select and prepare these leaders at present. Despite the great need of effective leadership in vocational education, most of the principals at private vocational high schools observed that the field was making almost no effort to develop these leaders. With increasing demand for effective leadership in engineering education, selection of principals for private vocational high schools should not be based solely on traditional criteria but on the types of leadership qualities they possess.

Leadership Theories

The theory of leadership in the first half of the 20th Century focused largely on *the great man* explanation. This was followed by trait theory, which attempted to identify the personality traits or characteristics of successful leaders. Theory then moved to the leadership style, the situation theory, and the contingent theory. And now, theory moves to focus on what Bass has called transformational leadership [8].

Transformational leadership has a positive correlation with how effective the leader is perceived to be by subordinates, how much extra effort subordinates will expend for the leader, how satisfied the subordinates are with the leader, and how well subordinates have performed as viewed by the leader [9].

The early reviews of literature by Stogdill and Mann found that there were no relationships between intelligence and personality factors and leadership. Recently, however, Lord, DeVader and Alliger have shown by means of meta-analysis methods that these attributes are significantly and consistently related to leadership. Moreover, Lord et al also indicated that attributes could transfer across situations to guide behaviour in a wide range of tasks, contexts and groups [10]. For instance, attributes determine the tendency of an individual to use transactional or transformational behaviours [11].

Jago defined leadership as both a *process* and a *property*. As a process, *leadership is the use of non-coercive influence to direct and coordinate the*

activities of the members of an organised group toward accomplishment of group objectives. As a property, leadership is ascribed to an individual by members of the group when they perceive the individual to possess certain attributes. The definition explains that leadership can be fully understood only by both leadership behaviours and leadership attributes [12].

Moss has provided a conceptualisation of leadership in vocational education that depicts the relationship among a leader's attributes, behaviours and effectiveness. He believes that *while it is a leader's behaviours that influence group performance, it is a leader's attributes that shape those behaviours* [13]. He also listed a set of leadership attributes that were hypothesised to predispose desirable leader behaviours. Therefore, it is meaningful to explore the relationship among leadership attributes, leadership behaviour and leadership effectiveness [13].

Liang indicated that all leadership attributes, which were selected by Moss, were strongly related to perceived leader effectiveness [14]. Charisma, intellectual stimulation, individualised consideration and inspiration were strongly and positively related leadership attributes [15].

PURPOSE

The purpose of this study was to examine the relationships among leaders' attributes, behaviours and the effectiveness of principals at private vocational high schools. The study attempted to provide answers to the following research questions:

- What is the relationship between selected leadership behaviours and leadership effectiveness of principals at private vocational high schools?
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THE DESIGN

Population and Sample

The population of the study was the 8,962 full-time faculty from the 102 private vocational high schools across Taiwan in 1999. The sample consisted of 1,528 subjects, selected in a disproportional stratified random sample by institute and gender.

Instrumentation

The research instrument was composed of two questionnaires. The first was the *Multifactor Leadership Questionnaire* (MLQ) designed by Bass in 1985 and revised in 1997 [16]. The questionnaire consists of three types of leadership styles, covering transformational, transactional and non-transactional leadership styles. Transformational leadership consists of four factors, which are charisma, individualised consideration, intellectual stimulation, and inspiration. Transactional leadership consists of two factors, which are contingent reward and management by exception. Non-transactional leadership contains just one factor: laissez-faire.

A principal components factor analysis was utilised with a varimax rotation. The seven factors used in the MLQ accounted for 89.5% of the common variance. These factors provided acceptable internal consistency [17].

Each factor consisted of ten items, except for the factor of inspiration, which had just seven items. Each item had five possible responses [18].

The second instrument was the *Leader Attributes Inventory* (LAI), which was compiled by Moss in 1988 and revised in 1994. He tested and found the 35 characteristics and management attributes that were most likely to predispose desirable leadership behaviours [19].

Data Collection

The two instruments were mailed directly to each faculty member of the selected sample. The package included a cover letter describing the purpose of the study, the LAQ and MLQ, plus a stamped return envelope. The usable return rate for the first mailing was about 46.32%.

A second set of instruments was then mailed to the persons who had not returned the first set. At the same time, follow-up phone calls were made in an effort to increase the return rate. As a result, 915 usable questionnaires were returned with a return rate of 59.88%. Of this, 411 were from males and 504 were from females.

Data Analyses

All statistical analyses were manipulated by SPSS for Windows release 6.0 on PC. In this study, both descriptive and inferential statistics were employed, including means, standard deviation, frequency, t-tests, Pearson product moment correlation and multiple regression analyses.

RESULTS AND CONCLUSIONS

At least three critical assumptions should be made explicit before the conclusions of the study are stated. First, the three-factor measure of leadership effectiveness must be acceptable. Second, a simple arithmetic mean of the three-factor measure is a better overall measure of effectiveness than any other combination of the three factors measures. Third, the perceptions of faculty about the principals of private vocational high schools' effectiveness, attributes and behaviours are a satisfactory means of assessing these variables. Given the validity of the assumptions, the following conclusions can be drawn from the 915 respondents.

All of the transformational behavioural factors: charisma, intellectual stimulation, individualised consideration and inspiration were strongly and positively related ($p \leq 0.001$) with all leadership attributes ($r = 0.76$ to 0.88). Among the transactional behavioural factors, contingent reward had mid-range positive relationships with the leadership attributes ($r = 0.77$ to 0.80 , $p \leq 0.001$). The transactional factor of management by exception had lower relationship with the leadership attributes ($r = 0.67$ to 0.70). The factor of laissez-faire had mid-range negative relationship ($r = -0.44$ to -0.46 , $p \leq 0.001$) with the leadership attributes (see Table 1).

As shown in Table 2, a combination of the following attributes were particularly useful in explaining the variance in transformational behavioural factors ($R^2 = 0.79$): A3 (optimistic); A6 (achievement-oriented); A10 (willing to accept responsibility); A22

Table 1: Person product-moment correlation coefficients (r) between leadership attributes and leadership behaviours.

Leadership style	Personal characteristics	Management attributes	Total leadership
Transformational leadership	0.86**	0.87**	0.88**
Charisma	0.76**	0.77**	0.78**
Inspiration	0.80**	0.81**	0.82**
Intellectual stimulation	0.80**	0.81**	0.83**
Individual consideration	0.78**	0.78**	0.80**
Transactional leadership	0.81**	0.83**	0.83**
Contingent reward	0.77**	0.79**	0.80**
Management by exception	0.67**	0.70**	0.70**
Non-transactional leadership			
Laissez-faire	-0.46**	-0.44**	-0.46**

** $p < 0.01$

Table 2: Regression equation for leadership attributes (independent variable) with transformational leadership behaviours (dependent variable).

Variables	Correlation coeff.(R)	Cumulative R ²		Beta	t
		R ²	Incr.		
A6(x ₆)	0.77	0.59	0.59	0.14	5.29**
A22(x ₂₂)	0.83	0.69	0.10	0.11	4.31**
A10(x ₁₀)	0.86	0.74	0.05	0.15	6.11**
A3(x ₃)	0.87	0.76	0.02	0.14	5.29**
A23(x ₂₃)	0.88	0.78	0.02	0.14	5.32**
A28(x ₂₈)	0.89	0.79	0.01	0.11	4.14**
Y=6.97+1.79x ₆ +1.40x ₂₂ +1.85x ₁₀ +1.68x ₃ +1.71x ₂₃ +1.34x ₂₈					

**p<0.01

Note: A3 (optimistic); A6 (achievement-oriented); A10 (willing to accept responsibility); A22(respect others); A23 (motivating others) and A28 (team building).

(respect others); A23 (motivating others) and A28 (team building).

The relationships between the four factors in transformational leadership and perceived mean (overall) effectiveness had a mid-range relationship ($r = 0.56$ to 0.77 , $p \leq 0.001$). The relationship between contingent reward and mean effectiveness was strong, and significant at the 0.001 level ($r = 0.74$). The management by exception had a weak relationship to mean effectiveness ($r = 0.54$). The factor of laissez-faire had low and negative relationship ($r = -0.37$, $p \leq 0.001$) with the mean effectiveness (see Table 3).

Table 3: Person product-moment correlation coefficients (r) between leadership effectiveness and leadership behaviours factors.

Leadership style	Goals attain	Leadership satisfaction	Work satisfaction	Mean effectiveness
Transformational	0.69**	0.82**	0.67**	0.78**
Charisma	0.61**	0.77**	0.61**	0.71**
Inspiration	0.60**	0.70**	0.56**	0.67**
Intellectual stimulation	0.64**	0.75**	0.62**	0.72**
Individual consideration	0.66**	0.77**	0.77**	0.75**
Transactional	0.64**	0.76**	0.63**	0.72**
Contingent reward	0.64**	0.78**	0.66**	0.74**
Management by exception	0.49**	0.56**	0.56**	0.54**
Non-transactional Laissez-faire	-0.3**	-0.41**	-0.32**	-0.37**

**p<0.01, *p<0.05

Table 4 illustrates a combination of the following leadership behaviours that were particularly useful in explaining the variance in mean effectiveness ($R^2 = 0.63$): F₄ (individual consideration); F₅ (contingent reward); F₁ (charisma) and F₃ (intellectual stimulation).

Table 4: Regression equation for leadership behaviours factors(independent variable) with mean effectiveness(dependent variable).

Variables	Correlation coefficients(R)	Cumulative R ²		Beta	t
		R ²	Increase		
F ₄	0.75	0.56	0.56	0.25	5.49**
F ₅	0.74	0.61	0.05	0.23	5.31**
F ₁	0.71	0.62	0.01	0.21	5.59**
F ₃	0.72	0.63	0.01	0.16	3.80**
Y=22.94+1.14 F ₄ +1.11 F ₅ +1.03 F ₁ +0.75 F ₃					

**p<0.01

Note: F₄(individual consideration), F₅(contingent reward), F₁(charisma), F₃(intellectual stimulation)

The relationships between the leadership attributes factor and perceived mean (overall) effectiveness had a relatively high relationship ($r = 0.74$ and $r = 0.77$, $p \leq 0.001$). The relationship between the leadership attributes factor and goals attainment had a mid-range relationship ($r = 0.65$ and $r = 0.68$, $p \leq 0.001$). The relationship between the leadership attributes factor and leadership satisfaction had the highest relationship ($r = 0.80$ and $r = 0.81$, $p \leq 0.001$). The relationship between the leadership attributes factor and work satisfaction also had a mid-range relationship ($r = 0.62$ and $r = 0.66$, $p \leq 0.001$) (see Table 5).

Table 5: Person product-moment correlation coefficients (r) between leadership effectiveness and leadership attributes.

	Goals attain	Leadership satisfaction	Work satisfaction	Mean effectiveness
Personal characteristics	0.68**	0.81**	0.66**	0.77**
Management attributes	0.65**	0.80**	0.62**	0.74**
Total leadership attributes	0.68**	0.82**	0.66**	0.77**

**p<0.01

Table 6 shows that a combination of the following leadership behaviours were particularly useful in explaining the variance in mean effectiveness ($R^2 = 0.64$): A23 (motivating others); A34 (commitment to the common good); A17 (ideological beliefs appropriate to the group); A22 (respect others) and A6 (achievement-oriented).

Table 6: Regression equation for leadership attributes (independent variable) with mean leadership effectiveness (dependent variable).

Variables	Correlation coefficients (R)	Cumulative R^2		Beta	t
		R^2	Increase		
A23(x_{23})	0.73	0.53	0.53	0.29	8.51**
A34(x_{34})	0.71	0.60	0.07	0.21	6.01**
A17(x_{17})	0.68	0.62	0.02	0.14	4.95**
A22(x_{22})	0.67	0.63	0.01	0.15	4.61**
A6(x_6)	0.65	0.64	0.01	0.13	4.17**
$Y = 21.55 + 4.79x_{23} + 3.57x_{34} + 2.45x_{17} + 2.52x_{22} + 2.25x_6$					

** $p < 0.01$

IMPLICATIONS FOR PRACTICE

The relationship among leadership attributes, transformational leadership behaviours and leadership effectiveness was relatively high for the principals at private vocational high schools in this study, as perceived by their faculties. This indicates that some leadership training might be helpful. Private vocational high schools can begin to create and provide learning experiences that develop those leadership attributes and leadership behaviours that are amenable to change.

Learning experiences that develop leadership attributes should be designed to induce present and potential principals to behave as transformational leaders as well as to utilise transactional behaviours when needed.

Leadership attributes amenable to further improvement by reasonable educational efforts should be used as selection criteria for positions that demand leadership behaviours.

REFERENCES

1. Bass, B.M., *Handbook of Leadership*. New York: Free Press (1990).
2. Moss, J.Jr and Liang, T., *Leadership, Leadership Development and the National Center for Research in Vocational Education*. Berkeley, CA: National Center for Research in Vocational Education (1990).
3. Chuang, C.B., The advantage and disadvantage of increasing higher technological and vocational education. *Technological and Vocational Educ. J. Bimonthly*, 51, 19-22 (1999).
4. Daughtry, L.H. and Finch, C.R., Effective leadership of vocational administrators as a function of gender and leadership style. *J. of Vocational Educ. Research*, 22, 3, 173-186 (1997).
5. Baugher, S.L., Stewart, B.R. and Martin, B., Leadership behaviours of vocational education administrators in the Midwest. *J. of Vocational Research*, 10, 3, 35-51 (1985).
6. Arcy, T., Self perceptions of leader behaviour of secondary and post secondary career oriented and vocational administrators. *College Student J.*, 18, 2, 169-176 (1984).
7. Lutz, C.M., The attributes of a good leader. *Vocational Educ. J.*, 61, 3, 28-30 (1986).
8. Bass, B.M., *Leadership and Performance Beyond Expectation*. New York: Free Press (1985).
9. Bass, B.M. and Avolio, B.J., *Improving Organizational Effectiveness through Transformational Leadership*. Newbury Park, CA: Sage Publications (1994).
10. Lord, R.G., DeVader, C.L. and Alliger, G.M., A meta-analysis of the relation between personality traits and leadership perceptions: an application of validity generalization procedure. *J. of Applied Psychology*, 71, 3, 402-410 (1986).
11. Avolio, B.J. and Jung, D.I., Opening the black box: an experimental investigation of the mediating effects of trust and value congruence on transformational and transactional leadership. *J. of Organizational Behaviour*, 21, 8, 949-946 (2000).
12. Jago, A.G., Leadership: perspectives in theory and research. *Management Science*, 28, 315-336 (1982).
13. Moss, J.Jr, Jensrud, Q. and Johansen, B.C., *An Evaluation of Ten Leadership Development Programs for Graduate students in Vocational Education*. Berkeley, CA: National Center for Research in Vocational Education (1992).
14. Liang, T., Relationships between Leader Attributes and the Effectiveness of Vocational Administrators. *Annual Convention of the American Vocational Assoc.*, Orlando, Florida (1989).
15. Liang, T., *Relationship among Leader Attributes, Behaviours and Effectiveness of Vocational Education Administrators*. Unpublished doctoral dissertation, University of Minnesota (1990).

16. Bass, B.M. and Avolio, B.J., *Full Range Leadership Development: Manual for the Multifactor Leadership Questionnaire*. Palo Alto, CA: Mind Garden (1997).
17. Bass, B.M., *Bass and Stogdill's Handbook of Leadership*. New York: Free Press (1990).
18. Bass, B.M., Ethics, character and authentic transformational leadership behaviour. *Leadership Quarterly*, 10, 2, 181-217 (1999).
19. Moss, J.Jr, Lambrecht, J.J. and Jensrud, Q., *Leader Attributes Inventory Manual*. Berkeley, CA: National Center for Research in Vocational Education (1994).

BIOGRAPHY



Morris Tsang-Lang Liang is an associate professor in the Department of Industrial Education at the National Changhua University of Education in Changhua, Taiwan. He earned his MA and PhD from the University of Wisconsin and University of Minnesota respectively.

Dr Liang's research interests have been focused on curriculum design and evaluation in the areas of vocational education at the high school level. He is also devoted to the theory of leadership development in different organisational settings.



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