Factors that may mediate the relationship between transformational leadership and organizational innovation

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The purpose of this study is to explore the excellent vocational high school teachers’ perceptions regarding organizational factors; these were related to the organization of the school and how this affected organizational innovation. Findings of this study provided the evidence that, there is a partial mediator effect on support for innovation and organizational learning in the relationship between transformational leadership and organizational innovation. The study also found out that majority of participants considered transformational leadership as an important factor for excellent vocational high school principals. This study will contribute significantly by providing an insight into how a school principal’s leader behavior will influence organizational innovation in a Taiwanese context. This study is important, as it provides the evidence that the principal leader behavior may influence teacher performance and in turn organizational learning. However, the organizational factors usually played an extremely important role in teachers’ attitudes towards teaching.

Key words: Vocational high school, transformational leadership and organizational innovation.

INTRODUCTION

In the past, technological and vocational education has made significant contributions to the Taiwan's economic development through training the technical specialists required for different projects (Ministry of Education, 2009).

However, with technological and vocational education in Taiwan now facing global competition and industrial transformation, technical and vocational education is failing to meet the needs of industry. This transformation has resulted in rapid changes to Taiwan’s industrial structure and technology base that has affected the preparedness of vocational school graduates to enter the high-tech workforce (Hsiao et al., 2008). The education of vocational high schools in Taiwan offers students a variety of vocational courses and focus on training them in skill and techniques. Inevitably, technological and vocational education must carry out changes and reforms in accordance with environmental requirements.

Leadership is a subset of management and that is important to facilitate organizational performance (Bedeian and Hunt, 2006).

The effectiveness of school improvement learning involves the creation of socially constructed interpretations of facts and knowledge which either entered the organization from the outside or were generated from within (Jackson, 2000). Facing increasingly rapid innovation, schools may have to change and develop in order to survive and to be effective (Kursunoglu and Tanriogen, 2009). Organizations can learn through the collective experiences, perspectives and capabilities...
of individuals (Rait, 1995). However, the school principal had leadership of administrator influences his teachers to achieve the goals and objective of the school (Olaleye, 2008). It seems that school principals have a positive influence on teachers’ organizational environment. Furthermore, school principals can act in both formal and informal ways to build commitment towards the organization. Principals hold a unique position in a school organization.

Transformational leadership is a leadership style that is defined as an expansion or extension of transactional behaviour, and is defined in terms of the leader’s effect on followers (Felfe et al., 2004). Transformational leadership is essentially a continuous process of inspiring group members to act in a concerted way to build enduring, values-based organizations while achieving significant shared aspirations (Weinstein, 2004). Recently, interest is growing in the influence of transformational leadership on innovation. Several empirical studies have provided evidence that transformational leadership is an important determinant of innovation. There is much empirical evidence in support of the conclusion that transformational leadership contributes to organizational innovation (Amabile et al., 2004; Gumusluoglu and Ilsev, 2009a; Gumusluoglu and Ilsev, 2009b; Liao et al., 2008; Lloréns-Montes et al., 2005; Peck et al., 2009).

Organizational learning should adopt more transformational and supportive styles of leadership that encourages members’ intellectual stimulation, individualized consideration, inspirational motivation and idealized influence (Lloréns-Montes et al., 2005). Organizational learning is an approach for school improvement and organizational change. However, organizational learning not only directly influences individual performance but also plays a moderator role in improving organizational performance (Bapuji and Crossan, 2004). How closely related are organizational learning and innovation?

A number of studies have shown that transformational leadership has a very positive influence on organizational innovation through its influence on followers’ perception of support for innovation (Gumusluoglu and Ilsev, 2009b). Transformational leadership factor also has a positive effect on organizational innovation when it is mediated by empowerment and the support for innovation (Jung et al., 2003). However, there has been a lack of studies examining organizational learning and support for innovation in which this effect occurs or is augmented. Empirical studies have not examined the mediating role of this contextual factor while investigating the relationship between the organizational learning and the support for innovation.

Thus, this study explores the impact of transformational leadership on organizational innovation and the role played by the organizational learning and the support for innovation as contextual factors. An integrative model of transformational leadership that included these effects on organizational innovation was developed for this purpose. The model is depicted in Figure 1.

THEORETICAL BACKGROUND AND HYPOTHESES

Transformational leadership and organizational innovation

A number of studies have shown that transformational leadership was positively associated with organizational innovation. Transformational leaders who engaged in inspirational motivation and intellectual stimulation were critical for organizational innovation (Elkins and Keller, 2003). Transformational leadership used by school principals is essential in sustaining the commitment of teachers (Marks and Printy, 2003). Similarly, Nir and Kranot et al. (2006) explored school principal’s leadership style and teachers’ self-efficacy. Data were collected from 755 elementary school teachers in Israel. The findings of this study indicate that transformational leaders were more likely to shape the kind of job circumstances that enable individual satisfaction and therefore, allow personal teacher efficacy to develop.

According to Reuvers et al. (2008), they investigated the relationships between transformational leadership and
innovative work behavior, and examining the moderating effect of gender of the manager and gender of the employee. Their sample consisted of 335 participants in four hospitals in Australia. In their study found a positive and significant relationship between transformational leadership and innovative work behaviour. Elenkov et al. (2005) surveyed senior executives at 223 firms and found that leadership behaviour positively influenced innovation and was moderated by top management team (TMT) heterogeneity. In addition, a study of 163 research and development (R and D) personnel and managers at 43 micro-and small-sized Turkish software development companies found that, transformational leadership is positively associated with organizational innovation (Gumusluoglu and Ilsev, 2009a). More indirect evidences for the positive relationship was examined in a study by Jung et al. (2009) who found that, transformational leadership positively influenced work outcomes in collectivistic cultures as well as affecting followers’ attitudes toward their leader. Based on the theoretical assumptions about transformational leadership, it may be argued that this leadership style is more likely to increase organizational innovation. All these features together allow for a better understanding of the strong positively relationships between transformational leadership and organizational innovation. Thus:

H1: Transformational leadership is positively associated with organizational innovation.

Mediation by support for innovation

The effect of transformational leadership on organizational innovation may also be mediated by the support for innovation. Scott and Bruce (1994) provided a model to test individual innovative behaviour for 172 employees of the R and D facility of a major U.S. corporation. Their study found that, perceived support for innovation was positively associated with innovative behaviour. Gumusluoglu and Ilsev (2009b) examined the moderating role of the support for innovation between transformational leadership and organizational innovation. From their results they concluded that, transformational leadership and external support for innovation had a significant effect on organizational innovation, but internal support for innovation was not confirmed.

However, Jung Chet al.(2003) who used a multisource approach to investigate 32 Taiwanese companies, showed that transformational leadership had significant and positive influence on organizational innovation when it were mediated by the empowerment and the support for innovation. Therefore, it could be concluded that it is possible to find evidence for the hypothesis that the support for innovation was positively mediates the relationship between transformational leadership and organizational innovation. Thus:

H2: Support for innovation mediates the relationship between transformational leadership and organizational innovation.

Mediation by organizational learning

Organizational learning can be seen as an ongoing learning process in a deliberate manner with a view to internal implementation of changes to support the organizational goals (Collinson et al., 2006). Previous research has shown that organizational learning had positive effects on organizational innovation. Bapuji and Crossan (2004) indicated that organizational learning influenced individual performance and acts as a moderator in improving variables on organizational performance. Liao and Wu (2010) examined the relationships among knowledge management, organizational learning and organizational innovation. The selected samples based on Commonwealth Magazine’s Top 1000 manufacturers and Top 100 financial firms in Taiwan. Their results found that knowledge management was an important input to organizations as well as organizational learning was a mediator.

Based on previous research, Vera and Crossan (2004) indicated that organizational learning “as a process of change in thought and action both individual and shared-embedded in and affected by the institutions of the organization.” Hsiao et al. (2009) also examined 418 teachers from 20 electrical and electronic clusters of vocational high school teachers in northern Taiwan. Their study found that the public school teachers’ perceived a higher level of transformational leadership and organizational learning that had a significant influence on organizational innovation than did the private school teachers. Weerawardena et al. (2006) examined 1,000 firms in Australia and found that, learning along with relational learning capabilities achieved higher degrees of organizational innovation. Based on these findings, organizational learning and organizational innovation appear to be closely related. Thus:

H3: Organizational learning mediates the relationship between transformational leadership and organizational innovation.

METHODS

Samples

Questionnaires were administered to Directors of Academic Affairs and Section Chiefs of Curriculum in 84 excellent vocational high schools in Taiwan. In each school, on average, 1 and/2 Directors of Academic Affairs and Section Chiefs of Curriculum responded to the questionnaire, for a total of 96 participants. The Directors of Academic Affairs and Section Chiefs of Curriculum were responsible for promoting integrated curriculum activities and fostering academic excellence in both faculty and students. Their responses were aggregated for each individual school. The samples consisted of 53
Table 1. Descriptive statistics.

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<td>3.27</td>
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<td>0.60</td>
<td>6.99</td>
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SD, strongly disagree; D, disagree; N, neutral; A, agree; SA, strongly agree.

Data analysis

The study used statistical techniques such as descriptive statistics, correlation coefficients, and regression analysis to investigate the relationship between transformational leadership and organizational innovation. In response to the research questions, correlation coefficients were used to find the relationships among transformational leadership, support for innovation, organizational learning, and organizational innovation. Through regression analysis, these variables were viewed as predictors to explain organizational innovation.

RESULTS

Descriptive statistics

As Table 1 illustrates, the participants had a middle level positive perception of transformational leadership (mean = 3.79), support for innovation (mean = 3.88), organizational learning (mean = 3.95), and organizational innovation (mean = 3.80). The results indicated 81.25% of the participants had positive (58.65%) or highly positive (22.60%) perceptions of transformational leadership. These results were reported for the following items: ‘My leader made me to look at problems from different point views’, ‘talked to me to be very optimistically about the future’, ‘helped me to build on their strengths’, ‘strengthened my desire to succeed’, and ‘meet my job-related needs’.

Procedures

Based on the literature review and previous research, three hypotheses were formulated and examined. The questionnaires were administered to participants during their work time. All participants filled out the same questionnaire. The questionnaire consists of three sections. The first section consists of demographic information about the Directors of Academic Affairs and Section Chiefs of Curriculum. The second section consisted of 20 items about transformational leadership, 11 items about the support for innovation, 7 items about organizational learning and 5 items about organizational innovation. All scales were composed of 5-point Likert-type items. The final section consists of 40 items. The average time for completing each questionnaire was 20 to 25 min.

Measures

The questionnaire was comprised of several scales. Transformational leadership was measured using a 20 items composite scale comprised of items form the MLQ 5X (Bass and Avolio, 2006). This scale identified five behaviours associated with transformational leaders: idealized influence–attributed (IIA), idealized influence–behaviour (IIIB), inspirational motivation (IM), intellectual stimulation (IS) and individualized consideration (IC). All items were rated using a 5-point scale ranging from 1 (‘Very strongly disagree’) to 5 (‘Very strongly agree’). The Cronbach’s α obtained for IIA was α = .86, for IIIB .89, for IM .82, for IS .84 and for IC .87. Sample items were ‘Got me to look at problems from many different angles’, ‘specified the importance of having a strong sense of purpose’, ‘went beyond self-interest for the good of the group’, ‘talked enthusiastically about what needed to be accomplished’, and ‘Treated others as individuals rather than just as members of the group’.

Support for innovation was measured by 22 items to which respondents were asked to respond on a 5-point ‘strongly disagree’ to ‘strongly agree’ scale. The scale was originally developed by Siegel and Kaemmerer (1978) and modified by Scott and Bruce (1994). Cronbach’s α for the support for innovation factor was α = 0.94. Sample items were ‘creativity is encouraged here’, ‘our ability to function creatively is respected by the leadership’, and ‘the main function of members in this organization is to follow orders which come down through channels’.

Organizational learning was measured by two items adapted from the scale of Kale et al. (2000), two additional items based on Edmondson (1999) and three items from Garcia-Morales et al. (2006). All items were rated using a 5-point scale ranging from 1 (‘Very strongly disagree’) to 5 (‘Very strongly agree’). Cronbach’s α for the organizational learning factor was α = .93. Sample items included ‘The organization has acquired and used much new and relevant knowledge that provided a competitive advantage over the past three years’, ‘the organization was a learning organization’ and ‘the educational centre greatly encourages the acquisition, sharing, dissemination and application of knowledge and learning among its different members.’

Organizational innovation was measured by five items adopted from Friedman (2003). All of these items were based on a five-point scale that ranged from 1 (‘Very strongly disagree’) to 5 (‘Very strongly agree’). Cronbach’s α for the organizational innovation factor was α = 0.88. Sample items were ‘teachers often introduce new ideas for school improvement and change’, ‘the school administration encourages teachers to seek new directions and challenges in teaching’ and ‘social and recreational activities are organized for teachers and other staff members.’

Male (55.2%) and female (44.8%). The average age was 32 years (SD= 10 years) with a range of 30 to 56 years. The average tenure at the school was 12 years. The sample cohort was highly educated: 34.4% had bachelor’s degrees, 63.5% had master’s degrees and 2.1% had PhD degrees.
Table 2. Correlations among the measures.

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<tr>
<td>Transformational leadership</td>
<td>(α= 0.95)</td>
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<tr>
<td>Support for innovation</td>
<td>0.76**</td>
<td>(α= 0.94)</td>
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<tr>
<td>Organizational learning</td>
<td>0.60**</td>
<td>0.74**</td>
<td>(α= 0.93)</td>
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<tr>
<td>Organizational innovation</td>
<td>0.65**</td>
<td>0.72**</td>
<td>0.73**</td>
<td>(α= 0.88)</td>
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n = 96, **p < 0.01.

Within the support for innovation, 78.98% of the participants agreed (62.41%) or strongly agreed (16.57%) that the organization could be described as flexible and continually adapting to change, and that there was adequate time available to pursue creative ideas. In organizational learning, most of the teachers agreed (55.06%) or strongly agreed (21.43%) that the organization was a learning organization, the educational centre greatly encourages the acquisition, and the educational centre fits the ideal model of a learning organization. For the organizational innovation, majority of the teachers agreed (57.89%) and strongly agreed (15.33%) that the school administration encouraged teachers to seek new directions and challenges in teaching and that social and recreational activities were organized for teachers and other staff members.

Correlation analysis

Table 2 present the correlation coefficients of the measures. Correlations in Table 2 indicates the strong relationship between transformational leadership and organizational innovation (r = .73, p < 0.01). Furthermore, transformational leadership has a significant and positive correlation with the support for innovation (r = .76, p < 0.01), organizational learning (r = .60, p < 0.01) and organizational innovation (r = .65, p < .01). Support for innovation had significant and positive correlation with organizational learning (r = .74, p < 0.01), and organizational innovation (r = .72, p < 0.01).

Mediator analysis

To examine for the mediating effects of the support for innovation and organizational learning, Baron and Kenny’s (1986) used three steps to testing mediation effect in their study. Their model tested four paths through three regression analyses. Objectives for mediation analysis may be used to test the effect of an intervention. The decision to accept or reject a mediation model is based on the results of these analyses. They proposed testing mediation should meet the following conditions: (a) Transformational leadership must significantly predict the support for innovation ($R^2 = 0.576, p < 0.01$) and organizational learning ($R^2 = 0.362, p < 0.01$); (b) the relationship between the independent variable (that is, transformational leadership) and the dependent variable (organizational innovation) must be significant before controlling the mediator (support for innovation and organizational learning). This relation was significant ($R^2 = 0.426, p < 0.01$); (c) support for innovation must significantly predict organizational innovation ($R^2 = 0.516, p < 0.01$) as well as organizational learning must significantly predict organizational innovation ($R^2 = 0.530, p < 0.01$), and (d) If all of these conditions hold in the predicted direction, then the effect of the independent variable (TL) on the dependent variable (OL) must be less in the third equation than in the second.

The regression analysis was conducted to test the linkages of the mediation model. Figure 2 presents the relationship model among transformational leadership, support for innovation, and organizational innovation. Figure 3 presents the relationship model among transformational leadership, organizational learning, and organizational innovation.

Figures 2 and 3 illustrate that each of these relationship models meets the four criteria which was recommended by Baron and Kenny (1986). These results provided evidence for the important mediating role of the support for innovation and organizational learning. Kenny et al. (1998) considered that, if the relationship between the independent and dependent variables remains significant, but the absolute value decreases, then partial mediation has occurred. Therefore, this result revealed that there is partial mediator effect for the support for innovation and organizational learning in the relationship between transformational leadership and organizational innovation (Table 3).

DISCUSSION

This study examines the impact of transformational leadership on organizational innovation and the role played by the support for innovation and organizational learning as mediating variables. We found that the highest importance rating given by participants was transformational leadership. Transformational leaders seek to
raise the consciousness of followers about the importance of organizational goals, and inspired them to transcend their own self-interest for the sake of the organization (Marks and Pinty, 2003). Inspirational motivation and intellectual stimulation offered by a transformational leader can be crucial for organizational innovation (Elkings and Keller, 2003). Effective leaders put considerable emphasis on developing effective leadership among the members. Therefore, the majority of participants considered that transformational leadership was an important factor for principals.

The second result found that, there was a positive and significant relationship among transformational leadership, support for innovation, organizational learning and organizational innovation. This result implies that transformational leadership has often emphasized the ingredients of change—ideas, innovation, influences and consideration in the process (Marks and Pinty, 2003). Organizations can improve their innovation performance by helping leaders engage in transformational leadership behaviors through training and mentoring processes (Jung et al., 2003). Schools will face new challenges requiring innovation and change. When the organizational learning approach was implemented well at school, it will bring forth better learning effectiveness for students, adults and the organization (Collinson et al., 2006). Successful reforms in these schools tended to be more dependent upon educational policy and school administrators, as well as on educational policy makers and educational researchers.

Further, transformational leadership had a positive effect on organizational innovation. The mediating effects of the support for innovation and organizational learning were also found to be significant between transformational leadership and organizational innovation. But, the indirect effect of organizational learning on organizational innovation is greater than the indirect effect by the support for innovation. Therefore, these results indicate that
there was partial mediator effect. Successful leaders were
those using both exploration and exploitation to create a
complex organizational context that inspires followers to
reach objectives and expectations, and support and trust
each other (Gison and Birkinshaw, 2004).

The results of this study have implications for the school
principals. First, school principals play the most important
role in organizational innovation. Effective school
principals may promote organizational innovation by using
both transformational leadership and organizational
learning at the same time, which will be better to than
using rewards and grant practices as a mean for
supportive innovation. Second, organizational learning
and support for innovation represent potentially important
mediators between transformational leadership and
organizational innovation. Thus, if school principals want
to create an innovative organization when the two
components exist at the same time, these two variables
will have a multiplying effect on organizational innovation.

Limitations

As the saying goes-“As is the principal, so is the school.”
Excellent vocational high school principals need to
simultaneously play management and transformational
leadership roles for effective organizational innovation.

From the results of this study, we may include several
limitations that suggest possibilities for future research.
First, this study examines only the role of transformational
leadership, support for innovation, organizational learning
and organizational innovation. This study showed that
transformational leadership was important determinants
of organizational innovation and encouraged school
principals to engage school teachers in the school
improvement process. Thus, it is possible that there are
other variables not included in this study.

The second limitation of this study relates to the
participants. Participants consisted of only 96 Directors of

Academic Affairs and Section Chiefs of Curriculum in
excellent vocational high schools in Taiwan. These
findings cannot be generalized to other non-excellent
vocational high schools. For this reason, future research
can be conducted with a collection of more samples in
different levels or groups.

In conclusion, the final limitation concerned the
self-reported survey tool. Self-reported survey data may
be subject to social desirability bias. Social desirability
bias can occur in survey research if participants answer
inaccurately to conform to social norms or expectations.
Moreover, social desirability bias may have affected exit
survey results. Therefore, future studies could expand the
sample size to include participants such as teachers,
students, parents and staff.

DIRECTIONS FOR FUTURE RESEARCH

This study investigated the mediated relationship between
the support for innovation and organizational learning.
Future research might also examine the moderated
relationship. Furthermore, the support for innovation and
organizational learning had partial mediator effects on
transformational leadership and organizational innovation.
Future studies could look at the effects of other contextual
variables such as organizational culture and
leader-member exchange. In addition, if future research
can be conducted with a larger sample across different
levels or groups, the results will be more robust.

Conclusions

This research examined the influence of transformational
leadership, support for innovation, and organizational
learning on organizational innovation. The findings
revealed that the support for innovation and organi-
zational learning act as mediators of the relationship
between transformational leadership and organizational innovation. At the same time, school principals played a central role in enhancing organizational innovation. This study also found that when school principals used the strategies of transformational leadership through the support for innovation and organizational learning, organizational learning would be a highly effective way to achieve organizational innovation in the excellent vocational high schools.

Schools must change and develop in order to survive and to be effective because of the increasingly rapid pace of innovation (Kursunoglu and Tanriogen, 2009). However, the behaviours of school principals occur in a far more complex environment involving many additional factors. Thus, this study suggests more insight is necessary into the influence of these factors through measurement of such aspects as the type of leader effectiveness, organizational citizenship behaviour, team culture, group cohesion, perceived organizational support, perceived supervisor support and leader-member exchange.

Organizational learning has focused on collective attention and learning among members when they seek continuous improvement for students, themselves, and the organization (Collinson et al., 2006). Thus, the results of this study suggest that successful organizational innovation requires strong leadership at all levels. If the support for innovation and organizational learning were implemented properly, schools have the capacity to help the organization learn better.

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