The Influences of School Supervisors’ Leadership Styles upon Organizational Effectiveness: Using Organizational Commitment and Organizational Change as Mediators

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ABSTRACT

The purpose of this study is to verify the effects of school supervisors’ leadership styles on organizational effectiveness, with organizational commitment and organizational change being the mediators. A questionnaire-based survey was conducted on full-time teachers holding lecturer or higher-level positions at a Taiwanese technological university. After using simple random sampling to yield knowledge from the population and sending out copies of questionnaire via mail, convenience sampling was adopted to avoid excessively low response rates. The overall model’s goodness-of-fit effect concerning the structural and measurement models were verified using linear Structural Equation Modelling (SEM). Regarding the path coefficients for implicit/unobservable variables in the structural model, the MacKinnon PRODCLIN 2 program was employed to test how significant the model’s total effect, specific mediation effects and direct effects were. Research results showed that: (1) the overall model had a statistically significant total effect; (2) supervisors’ leadership styles exerted a significantly direct effect on organizational effectiveness; (3) both organizational commitment and organizational change exerted significant specific mediation effects, although the former was greater than the latter. Keywords: Leadership style, Organizational effectiveness, Organizational commitment, Organizational change

INTRODUCTION

As rigorous competitions among colleges has complicated by the dwindling birth rate in Taiwan, triggering a craze for upgrades to the “technological university” status, shrinking enrolments and drastically increased school numbers have caused non-equilibrium in the market for educational resources, leaving private technological universities constantly threatened by under-enrolment or merger/acquisition talks.

To tackle the intensifying competition for new students in a rapidly changing environment, decision-makers at many schools are employing every possible student-recruiting strategy and organizational change, which are aimed to directly adjust the structure of school organizations but to now, nevertheless, these have failed to address the problem’s root causes. According to experts’ research findings, when making decisions or strategizing organizational change for a school, the supervisors should first adjust their leadership approaches/styles on a timely, flexible basis to cope with changes in the greater context. In other words, supervisors are supposed to revitalize and underscore a school organization’s distinctive appeal by changing the way they lead. They are also expected to communicate and negotiate in advance with the school organization’s members or teachers who perform duties directly related to teaching, in order to secure organizational commitments from the teaching staff. That way, serious conflicts over organizational change implementations can be avoided and organizational effectiveness enhanced (Nan-hsiung Hsu, 2010).
The competencies of teachers, who are a school’s most important human resource, are not only essential to the success of education but also a major driving force behind the policies of education/curricular reforms. A school’s organizational effectiveness will improve when the teachers comprehend its concepts/visions well enough to bolster teamwork among organization members, to sharpen their own competencies, and to increase identification with the organization (Hsieh, Lang and Chen, 2010).

Consequently, this author conducted a case study of a Taiwanese technological university and built a research model for analyses/verification in an attempt to understand the model’s goodness-of-fit. The specific purposes of this study were:
1. To verify and understand whether supervisors’ leadership styles at the school being examined exert a significant, positive and direct effect on organizational effectiveness;
2. To verify and understand whether supervisors’ leadership styles at the school being examined, mediated by organizational commitment, exert a significant and specific indirect mediation effect on organizational effectiveness;
3. To verify and understand whether supervisors’ leadership styles at the school being examined, mediated by organizational change, exert a significant, specific and indirect mediation effect on organizational effectiveness;
4. To determine which of the two mediators (i.e., organizational commitment and organizational change) has a larger specific indirect effect.

LITERATURE REVIEW

The purpose of this study is to verify the effects of leadership styles on the organizational effectiveness of a Taiwanese technological university, with organizational commitment and organizational change being the mediators. The relevant theories and studies are stated as follows:

Definitions of leadership and different leadership styles

Leadership is an individual’s behaviour that leads group activities toward a shared goal (Hemphill and Coons, 1957) as well as an ability, influence or motivation that directs individuals/organizations toward a certain goal (Bass, 1981). It is also defined as how a leader affects the process of organizational activities in order for an organized group to reach goals or make achievements as expected (Rauch and Behling, 1984; Cheng, 2011).

According to Hsu (1997), leadership is a process of interpersonal interactions that exerts influence on an individual or a group of persons under a given situation, in order to attain a specific group-oriented goal.

Chen (2009) considered leadership a process of using various behavioural approaches to guide organization members toward a shared goal. In that process, the leader exerts influence on organization members through interpersonal interactions; his/her personal qualities help attain organizational goals as they accomplish tasks while rewarding the employees.

Cheng (2011) believes that leadership is a process existing in organizations that vary in nature and form for attaining the organizational goals. In that process, he said, the leader uses his/her influence to create a team spirit among organization members while providing a driving force that motivates employees to be willing to strive toward organizational goals. Cheng went on to divide leadership styles into charismatic leadership and transformational leadership.
House (1971) put forth the path-goal theory to define four leadership styles: (1) directive leadership: a leadership style that familiarizes subordinates with their leaders’ expectations while giving them guidance as to how each task should be accomplished; it is similar to the initiating structure stated in Ohio State University’s two-dimensional theory of leadership styles; (2) supportive leadership: a leadership style that shows friendliness to subordinates and cares about their needs/feelings; it is similar to the consideration stated in the two-dimension theory of leadership styles; (3) participative leadership: leaders adopting this style seek opinions from the subordinates and respect their suggestions; they allow the subordinates to participate in the decision-making process; and (4) achievement-oriented leadership: leaders adopting this style shows confidence in their subordinates and set organizational goals for them.

In summary, leadership in the present study is conceptually defined as “a process existing in organizations that varies in nature and form in order to attain organizational goals, where the leader uses his/her influence to create a team spirit among organization members and at the same time provides a driving force that motivates members to strive toward organizational goals.” This study’s author categorizes leadership styles as recommended by House (1971).

Definitions and categories of organizational commitment

The concept of organizational commitment is derived from The Organization Man by Whyte (1965), who describes the organization man as one that “not only works for the organization, but also belongs to it.” (Tsai, 2001). Moreover, organizational commitment is a key factor for understanding employees’ work behaviour inside the organization.

Organizational commitment can be considered the relative intensity of an individual’s recognition of, and dedication to, the organizations’ goals and missions (Porter, Steers, Mowday & Boulian, 1974). Not only does it improve the solidarity among employees and the organization that hires them, it also creates a specific sense of pride for those belong to the organization (Jaworski & Kohli, 1993).

In their study on employees of psychologist training centres, Porter, Steers, Mowday & Boulian (1974) concluded that organizational commitment is the degree of an individual’s recognition of, and dedication to, a specific organization. They argued that members generally show three inclinations regarding the organization they belong to: (1) strong belief and acceptance of the organization’s goals and values; (2) the longing for staying a part of that organization; (3) the willingness to work in that organization’s best interest.

Mowday, Porter & Steers (1982) argued that excellent individuals build connections to their organizations by way of organizational commitment, which leads to satisfying interactive effects for themselves and the organization alike. In a questionnaire-based survey of state-run enterprises, they named the three perspectives of organization commitments, categorized according to the three inclinations mentioned in the previous passage. The three perspectives are: (1) value commitment; (2) retention commitment; (3) effort commitment.

Meyer & Allen (1991a) said the foundation on which organizational commitment is defined can be explained in three aspects: (1) affective attachment; (2) attachment due to the perceived cost; (3) attachment due to moral factors such as obligations and rules. Mayer & Allen (1991b) named the three findings as affective commitment, continuance commitment and normative commitment, respectively.

Wu (1993) underscored the importance of how much an individual identifies with his/her organization and shows commitment/loyalty toward it. The higher the degree of commitment, the more eagerly an individual considers him/herself an integral part of the organization.

Hsieh (1999) argued that organizational commitment is the degree of subjective feelings or
emotional responses of an individual member with regard to various situations/dimensions of his or her organization.

According to Chen and Yu (2000), organizational commitment is an attitude/behaviour displayed by an organizational member who approves of the organization’s objectives, feels proud of being part of the organization, behaves in loyalty to the organization, and expresses willingness to strive toward organizational goals.

Robbins (2001) considered organizational commitment an attitude toward work, which is the degree of an employee’s recognition of a specific organization and its goals, as well as how much he/she wishes to maintain the relationship with fellow organization members.

In summary, the definitions of organizational commitment vary depending on the research approaches, subjects and purposes, but the above-mentioned scholars all agreed that an individual’s approval of, and dedication to, an organization is an important concept behind organizational commitment. Many Taiwanese studies have been conducted using the retention commitment, value commitment and effort commitment (Mowdady et al., 1982) as major perspectives (Ding, 2000). The three perspectives have been proven highly valid in measuring organizational commitment.

This study’s author, therefore, adopts the definition proposed by Mowdady, et al. (1982) to conceptually define organizational commitment as “the degree of members’ approval of organizational goals and values, and how much they are willing to work extraordinarily hard to help the organization accomplish its goals” (Hsieh, 2006). As suggested by Mowdady et al. (1982), organizational commitments are categorized and defined in this study as: (1) retention commitment: an individual’s eagerness to maintain identity as the organizational member; (2) value commitment: an organizational member’s faith in, and genuine acceptance of, organizational goals and values; and (3) effort commitment: a member’s willingness to seek the organization’s best interests and make considerable efforts in this regard.

**Definitions and categories of organizational changes**

Jan (2006) said employees’ resistant responses to an organizational change include disobedience, indifference, procrastination and resignation, with such responses resulting from the need for security, habits or misunderstandings. Since employees’ resistance is a huge obstacle to implementing a change, he noted that an organization should make efforts to consider reducing such resistance, or obstacles, by: (1) encouraging employees to express opinions; (2) enhancing supervisor-subordinate communications; (3) improving the employees’ approval of, and support for, the organization; (4) redoubling efforts in employee education/training; and (5) offering material/psychological rewards to employees.

Hu (2007) defined organizational change by noting that an organization is an open organism that must transform, adjust and change in accordance with both the internal and external environments. While the internal adjustments are meant to improve organizational members’ attitudes and behaviour while refining the organizational culture, external adjustments further highlight the organization’s competitive advantages so as to achieve steady growth and enhanced performance. Such adjustments and strategies are referred to as organizational changes. After defining organizational changes, Hu classified those changes into proactive and reactive ones, depending on how proactively a business initiates them.

Meanwhile, Hsu (2010) believed an organization’s pursuit of change and innovation is a process that involves strategies, structures, managerial systems, skills, organizational culture, production methods, technical innovation, as well as the approaches to increasing organizational performance. In other words, development, transformation, innovation, turnarounds and renewal are the prerequisites of any organizational change.
Leavitt (1964) contended that an organization comprises four major perspectives that interact with one another, namely tasks, people, technologies and structure. The four perspectives are briefly described as follows:

1. Task-oriented changes: Literally, the task means major jobs in the organization such as production, manufacturing and services. Task-oriented changes are focused on external control, the organization’s responsibilities and products/services.

2. Structural changes: The structure represents an organization’s systems of communications, responsibility control and work procedures. Changes of this type are focused on internal control, the system of authority, organizational hierarchy, and segregation of duties among departments.

3. People-oriented changes: Changes of this type may involve differences in the size, attitudes or skills of an organization’s personnel, with a focus on internal flexibility, interpersonal relationship besides values/attitudes of workers inside the organization.

4. Technological changes: Changes in this category involve process-aiding tools like work evaluation mechanisms or computerized devices; they are focused on external flexibility, organizational skills of production systems, managerial procedures and information technologies.

Any change in the four highly inter-dependent perspectives will certainly affect the other three. For example, an organization that introduces a new technology is probably forced to transform its existing structures (e.g., communication mechanism and decision-making model), tasks (e.g., production, manufacturing and services) and personnel (e.g., the number, skills and job descriptions of employees). Therefore, Leavitt (1964) held the opinion that organizational changes can be accomplished through at least one of these perspectives.

To sum up, organizational change is conceptually defined in this study as “the transformations, adjustments and changes required of a school organization seeking survival and sustainable development in accordance with internal as well as external environments. While the internal adjustments are meant to improve the teaching staff’s attitudes and behaviour while refining the organizational culture, external adjustments further highlight the organization’s competitive advantages so as to achieve steady growth and enhanced performance.”

In the present study, organizational changes are categorized as recommended by Leavitt (1964) and operationally defined in accordance with that categorization.

Definitions of organizational effectiveness

Cheng (1998) said organizational effectiveness has always been the core element of organization theory and also the ultimate objective of organizational studies.

Wu (2002) defined school effectiveness as “a school’s ability to attain predetermined goals with satisfying performance in every dimension, from the students’ academic achievements, principal’s leadership, the school’s general ambiance, learning skills and strategies, school culture and values, to faculty development.”

Complicated and full of diversity, school organizations not only have relatively ill-defined goals vis-à-vis a typical corporate organization, but also are characterized by vagueness and abstraction. For instance, schools seldom have quantitatively displayed goals or tangibly finished products, which explains the difficulties in, and divided opinions over, defining or gauging school effectiveness (Cheng, 1998; Chang, 2001).

Hsieh (2006) defined school effectiveness as “the extent to which a school attains its educational goals” and categorized it into four perspectives: (1) administrative management; (2) teachers’ instructions;
(3) students’ performance and achievements; (4) the support from parents and communities.

In summary, a school’s organizational effectiveness is conceptually defined in this study as “the extent to which a school attains the predetermined goals.” Organizational effectiveness, therefore, is measured in the four dimensions recommended by Hsieh (2006), namely the “effectiveness of administrative management,” “effectiveness of teachers’ instructions,” “students’ performance and achievements” and “the support from parents and communities.” These dimensions serve as the four sub-perspectives of “a school’s organizational effectiveness” variable in this study, each operationally defined in accordance with how those categorized perspectives are defined.

The relationship between leadership styles and organizational effectiveness

According to House (1971), in order to enhance the subordinates’ work performance while satisfying them, a leader must consider the nature of backgrounds where those subordinates perform tasks, along with their personal qualities, before adopting a leadership style that makes the two contingent factors complimentary to each other. If the leadership style fails to match the nature of task background and/or subordinates, the leadership behaviour will end up being ineffective.

House, Woycke and Fodor (1994) mentioned that charismatic leadership, organizational performance and subordinate satisfaction are highly correlated.

Wang (2006) said a company executive’s leadership style has a significant, direct and positive effect on organizational culture, organizational commitment and organizational learning in “Applying Structural Equation Modelling to Study the Influence of Leadership, Organizational Culture, Organizational Commitment, Organizational Learning, Knowledge Management, and the Organizational Performance -- An Empirical Study of Life Insurance Finance.”

In “The Influence of Leadership, Organizational Culture, and Total Quality Management on the Organizational Performances-- An Empirical Study of Taiwan Sugar Corporation’s Business Divisions,” Huang (2007) said leadership styles affect organizational performance by way of organizational culture and/or total quality management; organizational culture affects organizational performance through total quality management; total quality management directly affects the organizational performance.

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In “The Relationship between the Organizational Change, Leadership Style, Organizational Culture and Job Performance-Evidence from Three Universities in Southern Taiwan,” Huang (2008) said leadership style affects work performance significantly in terms of charisma, motivation, intellectual inspirations and personal consideration, with charisma exerting the most significant influence.

Tamg (2008) noted the significantly positive effects of organizational justice, leadership styles and locus of control on self-efficacy and organizational performance (and their perspectives) in “Research on The Relationships Between Organizational Justice, Leadership Style and Locus of Control with Self-efficacy and Organizational Performance-A case Study on Volunteer Non-Commissioned Officers and Soldiers.”

Wang (2009) contended that leadership styles significantly affect organizational performance in “A Study of the Relationships among the Leadership Styles, Organizational Culture, Job Performance and Organizational Performance—Banking in Southern Taiwan as an Example.”

To sum up, this study’s author proposed the following hypothesis:

H1: Supervisors’ leadership styles at the school being examined affect organizational effectiveness in a significant, positive and direct way.
The relationship between leadership styles and organizational commitment

Chen (2008) noted that a principal’s curriculum leadership behaviour partially mediates the teachers’ perception of different leadership styles and organizational commitment in “Exploring Different Leadership Styles and Curriculum Leadership Behaviours of Principals, and Teachers’ Organizational Commitment.”

In “A Study of the Relationship Among Leadership Style, Job Characteristic, Organizational Commitment, and Job Involvement in Nonprofit Organizations: The Case of Social Welfare Association for Disabilities,” Hung (2010) said leadership styles significantly and positively affect employees’ organizational commitments at non-profit organizations.

In “The study on the relationship among organizational commitment leadership style and job performance-An example of the T company,” Liao (2011) said supervisors’ leadership styles and identification with the organization both have significant predictive power concerning work performance, with similarity being the most effective predictor.

Hsiao (2011) contended that the difference in supervisors’ leadership styles affects an employee’s organizational commitment only insignificantly in “A Research on the Relationships among Leadership Styles, Personality Traits, Job Satisfaction and Organizational Commitment – a Case of Employees of Manufacturing Industry in Central Taiwan.”

To sum up, this study’s author proposed the following hypothesis:

**H2:** Supervisors’ leadership styles at the school being examined exert a significant, positive and direct effect on the teaching staff’s organizational commitment.

The relationship between organizational commitment and organizational effectiveness

Chang (2004) said organizational commitment affects both the organizational citizenship behaviours and organizational performance in “A Study on the Relationship between Compensation Justice, Job Satisfaction, Organizational Learn, Organizational Commitment, Organizational Citizenship Behaviour and Organizational Performance – With the International Tourist’s Hotel’s Employees in Tainan.”

Ko (2008) said in “Exploring the Relationships among Training Quality, Organizational Commitment and Organizational Performance” that a company’s training quality, when partially mediated by organizational commitment, is significantly related to organizational performance.

In “A Study on the Relationships among Internal Marketing, Organizational Commitment, Job Satisfaction and Organizational Performance- The Example of Kaohsiung National Tax Administration, Ministry of Finance,” Tseng (2008) said organizational commitment is significantly and positively related to, and affects, organizational performance. Among others, the value commitment exerts the greatest positive effect on all perspectives of organizational performance; effort commitment affects both service quality and tax justice; retention commitment affects the administrative efficiency only.

Chang (2012) mentioned the significantly positive correlation between organizational commitment and organizational performance in “A Study on Organizational Culture, Organizational Performance, Job Stress and Organizational Commitment for Public Sector.”

In “The Study of the Correlation between Organizational Trust, Organizational Commitment and Organizational Performance-As an Example Of Case Company,” Chang (2012) argued that employees’ organizational commitment positively affects the organizational performance.

To sum up, this study’s author proposed the following hypothesis:

**H3:** The teaching staff’s organizational commitment at the school being examined affects the school’s organizational effectiveness in a significant, positive and direct way.
The relationship between leadership styles and organizational change

In “Exploring Leadership Styles, Organizational Change and Resistance: Taking the Example of Taiwan’s Three Government-Backed Commercial Banks,” Wen (1999) said the leadership styles and types of banks not only affect how the organizational change is perceived, but also significantly interact with each other.

Liao (2007) said in “A Study of Relationship among the Commands’ Leadership Style and Organizational Change on Constructing Learning Organization, Promoting Organizational Commitment and Improving Work Behaviour in 1st Air Force Area Logistic Command” that both learning organization and organizational commitment have partial predictive power with regard to work behaviour.

In his study of elementary schools in central Taiwan, Li (2008) noted that the principals’ leadership styles and school organizational change are highly correlated.

To sum up, this study’s author proposed the following hypothesis:

**H4:** Supervisors’ leadership styles at the school being examined affect the school’s organizational change in a significant positive and direct way.

The relationship between organizational change and organizational effectiveness

Chang (2006) said organizational change is significantly correlated with both organizational culture and organizational performance in “Relationships among Leadership Behaviours, Organizational Change, Organization Culture and Organization Performance in Mechanical Manufacturing Industry.”


Yeh (2007) said organizational change exerts a significantly positive effect on trust, job satisfaction and organizational performance in “An Empirical Study of the Relationship among Industrial Environment, Organization Change, Trust, Job Satisfaction and Organization Performance in Banking Industry.”

In “A Study on the Effect of Information Technology Application and Organizational Change on Organizational Performance in Financial Institutions,” Lin (2011) argued that changes in the organizational structure significantly and positively affect organizational performance.

Chien (2012) said organizational change significantly and positively affects the organizational performance in “An Empirical Study of The Relationships among Organizational Culture, Organizational Change and Organizational Effectiveness - The Case of Taiwanese Optical Communication Industry.”

To sum up, this study’s author proposed the following hypothesis:

**H5:** Organizational changes at the school being examined affect the school’s organizational effectiveness in a significant, positive and direct way.

RESEARCH METHOD

Figure 1 illustrates how motivations, research objectives and literature review cited in the previous passages led to this study’s hypotheses and conceptual research framework:
The design of questionnaire and CMV test

1. Designing the Questionnaire

The questionnaire in this study was compiled on the basis of multi-dimensional measurement, combines with the afore-mentioned observable perspectives. On a 7-point Likert Scale, the answers were measured with 7 denoting Strongly Agree and 1 denoting Strongly Disagree: the score grows in proportion to the degree of agreement.

The 16-item questionnaire for the leadership style perspective was patterned after that proposed by House (1971) on the basis of four variables (i.e., directive leadership, supportive leadership, participative leadership and achievement-oriented leadership), each comprising 4 question items.

The 12-item questionnaire for the organizational commitment perspective was inspired by the categorization proposed by Mowdady et al. (1982) on the basis of three variables (i.e., retention commitment, value commitment and effort commitment), each comprising 4 question items.

The 16-item questionnaire for the organizational change perspective was patterned after that proposed by Leavitt (1964) on the basis of four variables: task-oriented changes, people-oriented changes and technological changes. Designed on the basis of multi-dimensional measurement, the questionnaire contains 4 question items under each variable.

Finally, the 16-item questionnaire for the perspective of school’s organizational effectiveness was inspired by the categorization put forth by Sheng-yu Hsieh (September 2010). On the basis of four variables (i.e., effectiveness of administrative management, effectiveness of teachers’ instructions, students’ performance and achievements, and support from parents and communities), this questionnaire contains 4 question items under each variable.

2. CMV test

The questionnaire does not have any common method variance (CMV) problems by CFA comparison method (Lindel and Whitney, 2001) as tested and shown in Table 1.
Table 1: The results of CMV test.

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>DF</th>
<th>$\Delta\chi^2$</th>
<th>$\Delta$DF</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Factor</td>
<td>1458.6</td>
<td>208</td>
<td>912.3</td>
<td>26</td>
<td>0.002</td>
</tr>
<tr>
<td>Multi-Factor</td>
<td>546.3</td>
<td>182</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sampling method

This study’s author conducted a questionnaire-based survey on full-time teachers holding lecturers or higher-level positions at a Taiwanese technological university. Simple random sampling was used to yield information from the population and copies of questionnaire sent out via mail, followed by convenience sampling to avoid excessively low response rates. 10 copies of questionnaire were given out to experts in a pilot-test. A post-test was conducted after modifying the questionnaire in accordance with the experts’ suggestions. 300 copies of the official questionnaire were given out, with 203 valid copies returned at a 67.7% response rate (Fritz and Mackinnon, 2007).

The data obtained from questionnaire and measurement model

This study’s author adopted Linear SEM in a Confirmatory Factor Analysis (CFA) of the research framework and based the questionnaire design on four latent variables (i.e., leadership style, organizational commitment, organizational change and organizational effectiveness), each of which was divided into observable/explicit sub-variables that contain several questions, as shown in the table below. After processing the collected data, the author created a primary file that preceded the design of questionnaire, using multi-dimensional measurement for the construction of this study’s measurement model. However, the data was measured by dual parcels to ensure the computer software efficiently handled and/or measured all data (Chen, 2010). Table 2 shows the number of questions under each implicit or explicit variable, as well as the referential sources (Chang and Lee, 2012).

Table 2: Number of Questionnaire Items under each ‘Implicit Variable’ and ‘Observable Variable’

<table>
<thead>
<tr>
<th>Implicit Variables</th>
<th>Explicit Variables</th>
<th>Total Number of Questionnaire Items</th>
<th>Referential Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership style (X)</td>
<td>Directive leadership</td>
<td>4</td>
<td>House (1971)</td>
</tr>
<tr>
<td></td>
<td>Supportive leadership</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participative leadership</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Achievement-oriented leadership</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Organizational commitment (ME1)</td>
<td>Retention commitment</td>
<td>4</td>
<td>Mowday, Porter &amp; Steers (1982)</td>
</tr>
<tr>
<td></td>
<td>Value commitment</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Effort commitment</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Organizational change (ME2)</td>
<td>Task-oriented changes</td>
<td>4</td>
<td>Leavitt (1964)</td>
</tr>
<tr>
<td></td>
<td>People-oriented changes</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technological changes</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Structural changes</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Organizational effectiveness (Y)</td>
<td>Effectiveness of administrative management</td>
<td>4</td>
<td>Hsieh (September 2010)</td>
</tr>
<tr>
<td></td>
<td>Effectiveness of teachers’ instructions</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students’ performance and achievements</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Support from parents and communities</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
RESULTS AND ANALYSIS

Linear structural model analysis

This study includes a CFA, an analytical method contrary to the Exploratory Factor Analysis (EFA), on the four implicit/latent variables of leadership style, organizational commitment, organizational change and organizational effectiveness. SEM is made up of structural and measurement models to efficiently tackle the causal relationships among implicit/latent variables. The three parts of model-testing in this study are: (1) goodness-of-fit of the measurement model; (2) goodness-of-fit of the structural model; (3) the overall model’s conformity with goodness-of-fit indices. In other words, goodness-of-fit indices were applied to a test of the overall goodness-of-fit effect of SEM (Diamantopoulos & Siguaw, 2000; Lee, 2011).

Analysing fit of the measurement model

To a large extent, factor loading is intended to measure the intensity of linear correlation between each latent/implicit variable and a manifest/explicit one. The closer the factor loading is to 1, the better an observable variable is in measuring latent variables. Since this study’s reliability is supported by the fact that factor loadings for all observable variables range between 0.7 and 0.9, all observable/explicit variables in the measurement model appropriately gauged the latent/implicit ones. The Average Variance Extracted (AVE), on the other hand, gauges an implicit/implicit variable’s explanatory power of variance with regard to an observable one, with the AVE value growing in proportion to the reliability and convergent validity of that particular implicit/latent variable. As a rule, AVE must be larger than 0.5 for an observable variable’s explainable variance to exceed the measurement error (Fornell and Larcker, 1981). Since the values of factor loadings, Composite Reliability (C.R.) and Cronbach’s α in this study all exceed 0.7, with AVE values invariably larger than 0.5, the latent/implicit variables have excellent reliability and convergent validity (see Table 3, Table 4 and Figure 2).

<table>
<thead>
<tr>
<th>Implicit/latent variables</th>
<th>Observable/explicit variables</th>
<th>Factor loading</th>
<th>Composite Reliability (C. R.)</th>
<th>Cronbach’s α</th>
<th>Average Variance Extracted (AVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership style</td>
<td>x1</td>
<td>.811</td>
<td>.823</td>
<td>.821</td>
<td>.621</td>
</tr>
<tr>
<td></td>
<td>x2</td>
<td>.832</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational commitment</td>
<td>ε1</td>
<td>.831</td>
<td>.834</td>
<td>.823</td>
<td>.623</td>
</tr>
<tr>
<td></td>
<td>ε2</td>
<td>.823</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational change</td>
<td>ε3</td>
<td>.831</td>
<td>.836</td>
<td>.832</td>
<td>.631</td>
</tr>
<tr>
<td></td>
<td>ε4</td>
<td>.842</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational effectiveness</td>
<td>y1</td>
<td>.791</td>
<td>.812</td>
<td>.804</td>
<td>.612</td>
</tr>
<tr>
<td></td>
<td>y2</td>
<td>.811</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Judgment Indicators for the Measurement Model Standardized Regression Weights:

In this study, the discriminant validity among the model’s dimensions is determined using the AVE method. Fornell and Larcker (1981) said there will be discriminant validity between dimensions when the AVE exceeds the square of correlation coefficients in each dimension. Table 4 proves the discriminant validity among this study’s perspectives (i.e., leadership style, organizational commitment, organizational change and organizational effectiveness).
Table 4: Estimated Values for Discriminant Validity within the Confidence Interval

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>$\pm 2\sigma$</th>
<th>Bias-corrected</th>
<th>Percentile method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower</td>
<td>Upper</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>X $\leftrightarrow$ ME1</td>
<td>.493</td>
<td>.331</td>
<td>.653</td>
<td>.313</td>
</tr>
<tr>
<td>ME1 $\leftrightarrow$ Y</td>
<td>.511</td>
<td>.392</td>
<td>.631</td>
<td>.384</td>
</tr>
<tr>
<td>X $\leftrightarrow$ ME2</td>
<td>.484</td>
<td>.394</td>
<td>.584</td>
<td>.391</td>
</tr>
<tr>
<td>ME2 $\leftrightarrow$ Y</td>
<td>.494</td>
<td>.391</td>
<td>.614</td>
<td>.381</td>
</tr>
<tr>
<td>X $\leftrightarrow$ Y</td>
<td>.483</td>
<td>.374</td>
<td>.583</td>
<td>.361</td>
</tr>
</tbody>
</table>

Analysing fit of structural model

1. Path analysis results of structural model

This study’s author made sure that the model passed the goodness-of-fit test before calculating the parameter estimates, Standard Errors (S.E.) and Critical Ratio (C.R.) among latent variables, as shown in Table 5 and Table 6 (Leeb, 2008).

Table 5: Path Analysis Results of the Structural Model (Un-standardized)

<table>
<thead>
<tr>
<th>Path coefficients for each pair of latent variables</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership style (X) $\rightarrow$ Organizational commitment (ME1)</td>
<td>0.991</td>
<td>0.121</td>
<td>8.190</td>
<td>***</td>
<td>H1</td>
</tr>
<tr>
<td>Organizational commitment (ME1) $\rightarrow$ Organizational effectiveness (Y)</td>
<td>1.022</td>
<td>0.133</td>
<td>7.684</td>
<td>***</td>
<td>H2</td>
</tr>
<tr>
<td>Leadership style (X) $\rightarrow$ Organizational change (ME2)</td>
<td>0.973</td>
<td>0.131</td>
<td>7.427</td>
<td>***</td>
<td>H4</td>
</tr>
<tr>
<td>Organizational change (ME2) $\rightarrow$ Organizational effectiveness (Y)</td>
<td>0.832</td>
<td>0.124</td>
<td>6.711</td>
<td>***</td>
<td>H5</td>
</tr>
<tr>
<td>Leadership style (X) $\rightarrow$ Organizational effectiveness (Y)</td>
<td>0.662</td>
<td>0.193</td>
<td>3.430</td>
<td>***</td>
<td>H3</td>
</tr>
</tbody>
</table>

Note: * indicates $P<0.05$; ** indicates $P<0.01$; *** indicates $P<0.001$

Table 6: Standardized Regression Weights: (Group number 1–Default model)

<table>
<thead>
<tr>
<th>Path coefficients for each pair of latent variables</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership style (X) $\rightarrow$ Organizational commitment (ME1)</td>
<td>.433</td>
</tr>
<tr>
<td>Organizational commitment (ME1) $\rightarrow$ Organizational effectiveness (Y)</td>
<td>.501</td>
</tr>
<tr>
<td>Leadership style (X) $\rightarrow$ Organizational change (ME2)</td>
<td>.382</td>
</tr>
<tr>
<td>Organizational change (ME2) $\rightarrow$ Organizational effectiveness (Y)</td>
<td>.393</td>
</tr>
<tr>
<td>Leadership style (X) $\rightarrow$ Organizational effectiveness (Y)</td>
<td>.352</td>
</tr>
</tbody>
</table>

Note: * indicates $P<0.05$; ** indicates $P<0.01$; *** indicates $P<0.001$

2. Coefficient of Determination

The $R^2$ value (Squared Multiple Correlation, or SMC) indicates how well an implicit independent variable explains an implicit dependent one. Therefore, the $R^2$ values shown in Table 7 indicate that the implicit independent variables have adequate explanatory power on the implicit dependent variables, respectively. In Table 7, the coefficients of determination in path analysis, small as they may be, suggest that the implicit independent variables have a certain level of explanatory power regarding the implicit dependent ones, respectively, although that power is relatively low.

Table 7: Path Coefficient of Determination

<table>
<thead>
<tr>
<th>Coefficients of Determination</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership style (X) $\rightarrow$ Organizational commitment (ME1)</td>
<td>.243</td>
</tr>
<tr>
<td>Organizational commitment (ME1) $\rightarrow$ Organizational effectiveness (Y)</td>
<td>.261</td>
</tr>
<tr>
<td>Leadership style (X) $\rightarrow$ Organizational change (ME2)</td>
<td>.234</td>
</tr>
<tr>
<td>Organizational change (ME2) $\rightarrow$ Organizational effectiveness (Y)</td>
<td>.244</td>
</tr>
<tr>
<td>Leadership style (X) $\rightarrow$ Organizational effectiveness (Y)</td>
<td>.233</td>
</tr>
</tbody>
</table>
Indices of fit of the overall model

This study’s author adopted SEM for modelling in order to explore how implicit variables connect to one another in the Structural Model, whether the measurement model has measurement reliability, and how the overall model’s goodness-of-fit effect is. While $\chi^2$, d.f., GFI, AGFI, NFI, CFI, RMR and RMSEA are the goodness-of-fit indicators for the overall model, it is preferable that $\chi^2$/d.f. $<$5, $>$1>GFI$>$0.9, $>$1>NFI$>$0.9, $>$1>CFI$>$0.9, RMR$<$0.05 and RMSEA$<$0.05 (Bagozzi & Yi, 1988). In this study, the overall model has a satisfactory goodness-of-fit effect because $\chi^2$/d.f. $<$5 and the values of GFI, AGFI and NFI all exceed 0.90, with a below-0.05 RMR, as shown as in Table 8 (Lee, 2011).

<table>
<thead>
<tr>
<th>Determination index</th>
<th>$\chi^2$</th>
<th>DF</th>
<th>GFI</th>
<th>AGFI</th>
<th>NFI</th>
<th>CFI</th>
<th>RMR</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fit value</td>
<td>9.125</td>
<td>4</td>
<td>0.911</td>
<td>0.902</td>
<td>0.821</td>
<td>0.832</td>
<td>0.033</td>
<td>0.031</td>
</tr>
</tbody>
</table>

Table 8: Assessment of Fit of the Overall Model

Standardized Results of SEM Analysis

The model’s overall framework resulted from computer-aided standardization, as shown in Fig. 2.
Analytical testing of path effects for the structural model

Focused on the path coefficients between implicit/unobservable variables in the structural model, this study’s author adopted Mackinnon PRODCLIN2 to determine whether the structural model’s total effect, specific mediation effect and direct effect were statistically significant, as shown in Table 9 (MacKinnon, Fritz, Williams and Lockwood, 2007). Table 9 proves that the structural model’s total effect, specific mediation effect and direct effect are all significant. The structural model in Figure 2 contains path coefficients that suggest the specific indirect effects of organizational commitment and organizational change, or (a1*b1) and (a2*b2), respectively, account for \((c + (a1*b1))\) and \((c + (a2*b2))\) of the total effect. The two percentages of \((c + (a1*b1))\) and \((c + (a2*b2))\) are calculated to be 38.05% and 29.75%, respectively, in the following equations:

\[
(1) \quad \frac{(a1*b1)}{c + (a1*b1)} = \frac{0.45*0.50}{0.35 + (0.45*0.50)} = 38.05%
\]

\[
(2) \quad \frac{(a2*b2)}{c + (a2*b2)} = \frac{0.38*0.39}{0.35 + (0.38*0.39)} = 29.75%
\]

The calculated results suggest that the organizational commitment variable has a greater specific indirect effect than organizational change.

Table 9: Summary of Results Regarding the Mediation Effects

<table>
<thead>
<tr>
<th>Variable</th>
<th>MacKinnon PRODCLIN2 95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>X→ME1</td>
<td>.231</td>
</tr>
<tr>
<td>ME1→Y</td>
<td>.263</td>
</tr>
<tr>
<td>X→ME2</td>
<td>.232</td>
</tr>
<tr>
<td>ME2→Y</td>
<td>.216</td>
</tr>
<tr>
<td>X→Y</td>
<td>.113</td>
</tr>
</tbody>
</table>

The following results were derived from analyses mentioned above:

1. Supervisors’ leadership styles at the school being examined, mediated by organizational commitment, exert a significant and specific indirect mediation effect on organizational performance, hence the substantiated H1 and H2 (Hypothesis substantiated);
2. Supervisors’ leadership styles at the school being examined exert a significant, positive and direct effect on organizational effectiveness, with a 0.35 standardized path coefficient that supports H3 (Hypothesis substantiated);
3. Supervisors’ leadership styles at the school being examined, mediated by organizational change, exert a significant, specific and indirect mediation effect on organizational effectiveness, hence the substantiated H4 and H5 (Hypothesis substantiated);
4. Organizational commitment exerts a greater specific indirect effect than the other specific mediator: organizational change.

CONCLUSIONS AND SUGGESTIONS

Conclusions

Conclusions were derived from the afore-mentioned data analyses and results, as detailed in the following passages:
1. H1 and H2 are substantiated: Supervisors’ leadership styles at the school being examined, mediated by organizational commitment, exert a significant, specific and indirect mediation effect on organizational effectiveness. The conclusion echoes the argument of Liao (2011), Hsiao (2011), Chang (2012) and Chang (2012). Despite the different industries explored, these scholars agree in their research conclusions that leadership styles positively affect organizational commitment, which in turn positively affects organizational effectiveness.

2. H3 is substantiated: Supervisors’ leadership styles at the school being examined exert a significant, positive and direct effect on organizational effectiveness. That conclusion echoes arguments of Huang (2008) and House (1971). Despite the different industries explored, these scholars agree in their research conclusions that leadership styles affect organizational effectiveness in a significantly positive way.

3. H4 and H5 are substantiated: Supervisors’ leadership styles at the school being examined, mediated by organizational change, exert a significant, specific and indirect mediation effect on organizational effectiveness. That conclusion echoes arguments of Li (2008), Lin (2011) and Chien (2012). Despite the different industries explored, these scholars agree in their research conclusions that leadership styles positively affect organizational change, which in turn positively affect organizational effectiveness.

4. Comparing the mediation effects of organizational commitment and organizational change: between the two specific mediators in this study, organizational commitment is the variable that has a greater specific indirect effect than organizational change.

Contributions of the present study (Managerial significance of the present study)

Innovative applications of research method

1. Exploratory research enabled by multi-regression analyses accounts for a majority of the literature, leaving the CFA-based research framework with one cause, one effect, and two mediators rarely considered. Since the present study’s main perspectives are implicit variables, CFA and linear SEM, but not multi-regression analysis, appear to be suitable as measurement tool and model framework, respectively. Moreover, this study includes a series of analyses and tests of reliability, validity and CMV in the design of questionnaire scales and model dimensions, using relatively new statistical methods. That explains why this study is relatively innovative in terms of research method.

2. Contributions to the practices of Taiwanese technological universities: Unlike the previous studies that were largely based on EFA, this study’s author performed modelling in accordance with the summarized literature review and then verified the model’s goodness-of-fit effects. The present study, consequently, is a CFA-based one addressing topics that are both important and innovative in terms of business practices, with the research results providing a reference for further studies in relevant fields, and also for the management of the school examined in this study seeking to improve organizational effectiveness with strategic managerial decisions.

Limitations and suggestions

1. Considering the limited amount of research resources, simple random sampling was used to yield information from the population and copies of questionnaire sent out via mail, followed by convenience sampling to avoid excessively low response rates. That method, however, led to sampling bias and unsatisfactory reliability. Future studies are advised to use other sampling methods (e.g., stratified random sampling) instead.
2. Regarding modelling for a CFA-based study like the present one, it is advisable that a simple verification model be built to avoid excessive complexity, and the subsequently poor goodness-of-fit (Chen, 2010). This study’s author, therefore, decided to focus solely on the two mediators of organizational commitment and organizational change, and a comparison of the two mediators in order to determine which of them had a greater specific indirect effect. Future researchers, nevertheless, may increase the number of mediators and compare their specific indirect effects.

3. This study is focused solely on the CFA of a Taiwan-listed company, and future researchers are advised to conduct similar studies on a wider range of companies or different industries for comparative analyses of multiple groups.

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