

Full Length Research Paper

Research on school organizational change and its impact on organizational effectiveness with organizational citizenship behavior and organizational culture as mediators

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Accepted 23 August, 2011

The primary purpose of this research was to verify the impact of a school's organizational changes on organizational effectiveness. The research object was a university of science and technology in Taiwan with organizational citizenship behavior (OCB) and organizational culture as the mediating variables. Convenience sampling was adopted to get samples from the population. SEM was used to verify the goodness-of-fit of this research's overall model and its structural model and measure model. Then, aiming at the path coefficient among the "implicit variables" (or called latent variables) of the structural model the Sobel Test was conducted with the maximum likelihood estimation (MLE) to examine whether the direct effects, mediating effects, and overall effects of the model was significant. The research results showed that the impact of organizational effectiveness by the school organization change has an "insignificant" direct effect and a "significant" mediating effect. Mediating effect was shown through the two mediators, "organizational citizenship behavior" and "organizational culture".

Key words: Organizational changes, organizational effectiveness, organizational citizenship behavior, organizational culture.

INTRODUCTION

Currently, due to the growing problem of "low birth rate" in Taiwan, plus many technical colleges having been upgraded to universities of science and technology, some private universities of science and technology faced insufficient enrollment or their fate was often heard of in mergers and acquisitions. In response to the current increasingly competitive enrollment environment, many decision makers of the schools have made all out great efforts in the enrollment strategies and adopted organizational changes, directly adjusting the organizational

structure to respond to the changing situation. However, directly adjusting the organizational structure is a specious way treating only the symptoms. In fact, according to the research results of some experts and scholars, when developing the strategy of organizational changes, organizational decision makers of the schools should first change the organizational culture making it more active and developing more attractive characteristics, or carrying out thorough communication and consultation with organizational members directly related to teaching or teachers in advance, to gain greater organizational commitment from the teachers. Such a decision making view not only avoids the serious conflict caused while executing the organizational changes, but can also enhance organizational effectiveness (Hsu, 2010). Because "education is the cornerstone of national development", however, for all practical purposes, teachers are the most important human resources in the schools.

Abbreviations: OCB, Organizational citizenship behavior; MLE, maximum likelihood estimation; CVF, competing values framework; SEM, structure equation modeling; CFA, confirmatory factor analysis; EFA, exploratory factor analysis; AVE, average variance extracted; SE, standard error; CR, critical ratio; SMC, squared multiple correlation.

The quality of teachers is vital to the success or failure of education.

They can be major forces behind such policies as education and curriculum reforms. Secondly, if teachers understand the concept and vision of the school, then can strengthen team cooperation among members of the organization, and thus enrich and identify with the school organization. This is helpful to elevate the organizational effectiveness of the school (Hsieh et al., 2010). Thus, this study will use a science and Technology University in Taiwan as the object of research, to establish the research model, verify it, and understand the model's goodness-of-fit. In other words, the specific purpose of the research is as follows:

1. To verify and understand when the case school implemented organizational changes, did it have a significant positive direct effect on organizational effectiveness?
2. With the teachers' organizational citizenship behavior as the mediating variable, to verify and understand the impact on organizational effectiveness when the school implemented the organizational changes, did it have a significant indirect mediating effect?
3. With organizational culture as the mediating variable, to verify and understand the impact on organizational effectiveness when the school implemented the organizational changes, did it have a significant indirect mediating effect?
4. The research results can be provided to the authority of the case school to be used as a decision-making reference when implementing organizational changes.

LITERATURE REVIEW

The primary purpose of this research was to use a science and technology university in Taiwan as the object of research, to verify the influencing effect of school organizational changes on the organizational effectiveness, with organizational citizenship behavior and organizational culture as the mediators. The theory and related research are, respectively explained as follows:

The definition and categories of organizational changes

In defining "organizational changes," Hu (2007) considered an organization as an open organism. Therefore, it must vary, adapt, and change according to the internal and external environments. The internal adjustment lies in improving the members' attitude, behavior and elevating the organization's culture. The external adjustment is to bring the organizational advantages into play further, to achieve the goal of stable growth and performance improvement. Such an adjustment and strategy is called organizational change. Other than defining organizational change, Hu (2007) in accordance with the degree of being proactive when changes occurred to an enterprise,

separated organizational changes into two types: proactive and reactive. For the promotion of organizational change, Chan (2006) mentioned a further step when in the process of promotion, potential staff resistance reaction that might occur, such as disobedience, indifference, slowdowns, turnover, etc., as well as the causes of resistance, such as the needs for security, habits, misunderstanding, etc. These forms of resistance will form a power drag to the promotion of changes. In this regard, Chan felt that one should consider how to lower resistance and made the following proposal: Allow employees to participate in the expression of opinions, promote communication among one another, increase employee recognition and support, strengthen education and training, adopt material and emotional awards..., etc. in ways that can lower the drag on the promoted changed. Hsu (2010) believes that the innovation and the change process of an organization, including strategy, structure, management system, technology, organizational culture, innovation of production modes and technology, and approaches and methods, can improve effective performance of an organization. Therefore, organizational changes must include development, transformation, innovation, changing directions, and renewal. Leavitt (1964) believes that organizations are composed of four main structures and associated interactive surfaces.

They are the four dimensions of mission, people, technology and structure, etc. They are briefly described as follows:

- (1) Mission changes: The so-called mission is primarily the work of an organization, such as production, manufacturing and services. It emphasizes external control, pays attention to what the organization should do, and the products and services it provides.
- (2) Structural changes: Structure represents the system of communication, the system of authority and responsibility management, and the system of work processes. It emphasizes on internal control, organizational hierarchy, partitioning of departments, etc.
- (3) Personnel changes: For example, the number of people in an organization, changes in attitude or skills. It emphasizes internal flexibility, pays attention to human relations within the organization and workers' values and attitudes.
- (4) Technical changes: It refers to a tool that can assist in the process. For example, a mechanism to measure the work or computers, etc. It emphasizes the degree of external flexibility, focuses on the organizational technology of the production system, management procedures and information technology, etc.

These four dimensions are highly interdependent.

The change of any one of these organizational dimensions affects the other organizational dimensions. For example, when an organization introduces new technology, it leads to changes to the original structure (for example: communication mechanism, decision-making

model, etc.); mission changes (for example: production, manufacturing and service); changes in personnel (for example, number of employees, skills and work content); therefore, when studying organizational changes, Leavitt felt one can seek changes from one or more dimensions. Summarizing the views of the afore scholars, the "conceptual definition" of "organizational changes" for the research is, in order to survive and to develop in a sustainable manner; an organization must vary, adjust and change according to the internal and external environments. The internal adjustment lies in improving the teachers' attitudes, behavior and elevating the organization's culture. The external adjustment is to bring the organizational advantages into play further, thus achieving the goal of stable growth and performance improvement. Therefore, the process of innovation and change of an organization is called organizational change. It includes development, transformation, innovation, changing directions, renewal, etc. In addition, many documents have been reviewed. Because most of the organizational change types mentioned the four concepts of personnel, technology, mission and structure. They matched the "organizational change" variables proposed by Leavitt (1964). That model of organizational change is still being widely adopted up to now. Thus, Leavitt's classification of the variables for the "organizational change" was adopted by this research for the case school. In addition, the definition of classification variables was used as the research's "operational definition."

Organizational culture of schools

The meaning of school organization culture

A school organization is like a small society, with the most basic structure of the organization as its culture. The school culture relates to the school's administrative operations, and it directly affects the students and the teachers. Therefore, it is necessary to carefully examine the school culture (Chang, 2000). Because a school is an open organization and it's a highly diversified system, a school's organization possesses multidimensional characteristics. As a result, there is a lack of a theoretical consensus in the discussion on organizational culture. This makes the research of a school's organizational culture, whether it is a choice of factual content, or the give and take of ideal values, often encounters the dilemma of "old wine in a new bottle". Therefore, how to establish an integrated research model in order to study a school's organizational culture is an important orientation in the research of school organization (Cheng, 1996). Thus, this perspective makes it necessary for this research to continue a step further. In addition, school organizational culture means the value judgment and recognition of member characteristics, leader's characters, organizational cohesion, organizational atmosphere and management style within the organization by the

members of the school organization. This includes the four levels of rational dominant culture, growth adjustment culture, consensus building culture, hierarchy control culture. Thus, when doing research in organization-related issues, an inclusive thinking mode is needed that is more able to handle the conflicts and paradox within an organization (Hsieh et al., 2010). And Quinn and Cameron's (1988) "competing values framework" is very suitable to study the structure of organizational culture.

The organizational culture under the path of competitive values can be divided into four kinds: rational dominant, growth adjustment, consensus and hierarchy control. These four types of culture are introduced as follows:

Rational dominant culture

It means the organization tends to have the characteristics of competition, control and integration. The evaluation of members by the organization focuses on work performance. It emphasizes a clarification of goals, the establishment of breakdown, and the efficiency of decision making, thus enhancing organizational effectiveness. Members' behavioral motivation is mission-oriented. The main orientation is whether the goal is accomplished or not.

Growth adjustment culture

It means the organization has the characteristics of being flexible and external-oriented. The evaluation of the members by the organization focuses mainly on the level of effort. There is an emphasis on members' spirit of adventure, continuous innovation, and the acquisition of resources. The behavioral motivation of the members is growth-oriented, so they can adapt to the external changes.

Consensual culture

It means the organization has the characteristics of tending to care about its members, internal maintenance, etc. The evaluation of the members by the organization focuses on interpersonal relations. It emphasizes team cooperation, trustworthy support and participation in decision making. The behavioral motivation of the members emphasizes the orientation of establishing cohesion, harmonious relationships and sharing welt and was among the organization members.

Hierarchical control culture

It means the organization has the characteristics of tending to be stable, safe and predictable. The evaluation of members by the organization focuses on the published

formal standards. It emphasizes hierarchy, clearly defined responsibilities, supervision and control. The behavioral motivation is oriented toward acting in accordance with the regulations and executing in accordance with the laws. Furthermore, culture to an organization is like character to a person. Culture is an inherent, holistic entity. It provides meaning, direction and motivational forces to members of an organization (Chang, 2000). Therefore, organizational culture provides the way of thinking for members of an organization. It affects the value judgment and behavioral expression of members within an organization. School organizations have the characteristics of being diverse and complex. There are various ways and means to understand organizations. One of them is to gain an in-depth understanding of the true face of an organization through researching the organizational culture (Chang, 2001). In summary, due to the differences and similarities of organizational culture, there is a phenomenon of the values of an organizational culture being diverse. Thus, an organization cannot completely conform to one of the aforementioned cultural characteristics and it should be a mix of the above four cultures, with only differences in the extent of a culture.

The definition of organizational culture

Organizational culture is an important factor in evaluating an enterprise's competitiveness. It reflects the personality characteristics of the enterprise, and is closely related to the core competitiveness of enterprises (Huang, 2009). Organizational culture is a term often referred to when studying organizational behavior. It takes a long time to shape, form and evolve the culture of an organization. Many domestic and overseas scholars all have different definitions and opinions about organizational culture. Lee (2002) felt that an organizational culture is a product of long-term interaction between internal system operations and external environment. It's a complex regarding values, beliefs, consciousness, thoughts and action within an organization. Its existence is invisible. But, it regulates the action and expression of members and organization tangibly. It forms a phenomenon of an organization shown in daily life. As indicated in Tseng's (2006) research, organizational culture is a pattern expressed by an organization's common beliefs and expectations. Daft (2009) felt an organizational culture is the important values, faith, way of thinking and code of conduct shared by all members of the organization. Liu's (2004) research mentioned excellent organizational culture enhances organizational effectiveness and improves productivity. After consolidating the definitions of the above scholars, the "conceptual definition" of the organizational culture in this research is taken to mean "an organization's external environment, society and cultural background formed a cultural arena and organization members are in contact and influencing one other. In addition, it's a complex within an organization regarding values, faith,

consciousness, thoughts and action. Its existence is invisible. But, it regulates the action and expression of members and organization tangibly. It forms a phenomenon of an organization shown in daily life."

Measurement of organizational culture

Organizational culture passes through formation and evolution, but it is not easy to change an organizational culture. However, under certain circumstances such as the new style of the organization's leadership, the innovation of organization system and operation, the change in management method, the organization members that introduced new concept, a cultural sub-system formed various situation such as the coordination of work attitude and enhancing employee participation, etc can easily changed the organizational culture, improving organizational effectiveness. Therefore, this research assumed that a school's organizational change will affect the organizational culture, and the organizational culture will also affect the organizational effectiveness. It can be seen that this study treats "organizational culture" as a mediating variable. Cameron (1985) distinguished organizational culture into the following four kinds according to the inner-outer orientation of the policy focus and the flexibility control of the organizational structure.

Consensual culture

This culture tends to be flexible and introverted. The work environment is somewhat open, harmonious. It gives employees the feeling of being a member of a big family. It is usually more conservative, unwilling to take greater risks and make changes. The organization is relatively flexible and emphasizes internal maintenance. This type of culture focuses on the cohesion within the organization. The evaluation of the members tends to emphasize on human relationships. It is highly flexible and internally oriented. It emphasizes openness, commitment, and morale.

Development culture

This culture tends to be flexible and open. It emphasizes organization innovation and challenge. It is relatively proactive and it trusts employees. It is able to take on greater risks and changes. In order to enhance flexibility, to care about employees, it places more emphasis more on external activities. The evaluation of organization members mainly depends on the degree of members' effort. Therefore, organization members tend to pursue growth as their behavioral motivation. The organization is highly flexible and externally oriented. It emphasizes innovation, adaptability, growth and the acquisition of resources.

Rational culture

This culture emphasizes on cost control and values work efficiency. It focuses on the performance competition among groups or members. Enterprises of this type of culture are willing to take on greater risks to accept changes. The purpose is stability and control. This organizational culture emphasizes external activities. In this organizational culture, the evaluation of the employees by the organization emphasizes work performance and employees' behavioral motivation often tends to be task-oriented. It is highly controlled and externally oriented, focusing on clarity of goals, productivity and achievement.

Hierarchical culture

This culture is control-oriented and introverted. The organizational characteristics are the framework of authority and responsibility, hierarchical systems, clearly defined workflow processes and general standardization, making employees feel that the company management is built on the basis of control and authority so employee work style is relatively conservative. This is an organizational culture which makes internal adjustments and maintains activities to obtain stability and control of the organization. The organizational learning of this kind of culture is to follow the regulations to do work; everything is carried out according to the law. Therefore, its evaluation of organization members' performance completely follows the standards of clearly published regulations. It is highly controlled and internally oriented. All in all, after reviewing most of the literature, there were four concepts mentioned in the types of organizational culture: "consensual culture", "development culture", "rational culture", "hierarchical culture". (The former two are preferred by today's enterprise organizations and non-profit organizations, and the latter two are preferred by today's government agencies). This is in line with the organizational culture dimension model proposed by Cameron (1985), which is still widely adopted until now. Therefore, this research targeted the dimension of "organizational culture" and adopted Cameron's classification and used his definition of classification dimension as this research's "operational definition".

Organizational citizenship behavior

The basic concept of "organizational citizenship" behavior

"Pursuing excellence, improving quality" has been the ultimate goal of an organization. It is also the goal endeavored by a school administration. Organizational citizenship behavior means the behavior of organization

members beyond the norms of their formal role. This behavior usually showed voluntarily by organization members. And it has a long-term positive meaning to the organizational performance (Hsu, 2002). Organ (1988) also thought organizational citizenship behavior will be helpful to organizational effectiveness. Thus, the accomplishment of organizational goals is closely related to organizational citizenship behavior. Foreign researchers such as Podsakoff and Mackenzie (1994) and Podsakoff et al. (1997) did research on the insurance industry and the paper industry, respectively within the United States. They found out that most dimensions of organizational citizenship behavior all had a positive effect on team performance. In the domestic research arena, the research results of Wang (1995) and Kuo (2004) all found positive relationship between organizational citizenship behaviors with organizational effectiveness. If educational organization can take lessons from the organizational citizenship behavior emphasized by the enterprise organizations to guide the teachers and administrative personnel to make voluntary contribution to the organization, it is believed this would be helpful to the advancement of a school's effectiveness. Organ (1988) felt that the organizational culture and organizational citizenship behavior are closely related.

The current domestic research situation on subjects related to organizational culture and organizational citizenship behavior was observed. Most research objects were public or private enterprises or business groups. There were relatively fewer studies in the field of education. Therefore, this study has considerable value for further research. The behavior of organization members within an organization can be considered as a kind of organizational behavior. Organizational behavior originated in Hawthirne's studies which discovered work motivation and social interaction are the important factors that determine job performance within an organization (Cheng, 2003). The concept of organizational citizenship behavior originated from Katz's (1964) thoughts of behavior beyond one's role, and it started from the role theory. It explained how people, in organization, formed their role behavior as requested by the organization (Chiang and Cheng, 2003). Robbins (2003) also pointed out "organizational citizenship behavior" means "the voluntary, unconditional behavior of employees beyond the requirement of their formal duties. And this kind of behavior is beneficial to the elevation of organizational effectiveness". And Robbins' definition was adopted by this research to be the "conceptual definition" of organizational citizenship behavior. There are many related studies that have carried out research on the level factor of organizational citizenship behavior. This research considered the theoretical model of specialists and scholars. Then, the categories proposed by Hsieh et al. (2010) were adopted as the measurement dimension of "organizational citizenship behavior". It was separated into four levels: "identifying with the organization",

“assisting colleagues”, not competing for profit and seeking private gain”, and “professionalism” as “the variable of teacher’s organizational citizenship behavior” and used its definition of classification dimensions as the “operational definition” of the research.

The definition of school effectiveness

Effectiveness and efficiency are two different concepts. The former emphasizes the accomplishment of the organizational goals. The latter emphasizes the effective utilization of resources. Generally speaking, the goals pursued by an organization (effectiveness) are more important than the utilization of resources (efficiency) (Wu, 2002). If “effectiveness” is defined as the degree in which a specific goal has been accomplished, then if a school can accomplish targeted goals, then it’s an effective school (Wu, 2002). Because a school’s organization is complex and diverse, it’s more unclear than the goals of regular enterprise organization. And it possesses the characteristics of being vague and abstract (for example, the goals of a school sometimes cannot be easily quantified. Schools do not have clearly visible products). Therefore, it’s difficult to define or measure a school’s effectiveness. As a result, up to now there are no common views about the definition of a school’s effectiveness (Cheng, 1998; Chang, 2001). However, this research’s “conceptual definition” of “school effectiveness” is “the extent to which a school can accomplish its targeted goals”. Organizational effectiveness has always been the core of organization theory.

It is also the ultimate objective of organization studies (Cheng, 1998). Ouchi (1983), Peter and Waterman (1982), and other scholars advocated a close relationship between organizational effectiveness and organizational culture. There was also a domestic researcher who found out that organizational culture and organizational effectiveness is closely related (Wu, 1990). Research on school effectiveness often requires mention of a school’s characteristics or culture. Culture can help members find their own perception of their respective organizations; it thereby guides thinking, feelings and influences behavior. Good school organizational culture can improve a school’s effectiveness (Chang, 2001). The domestic research situation on the relationship between organizational culture and organizational effectiveness has been observed, with the research objects being mostly enterprises. There are relatively fewer studies in the field of education. This is the reason why this research should be continued a step further. There is plenty of related literature on the research of level factors of school effectiveness. But, this research adopted the classification by Hsieh et al. (2010) as the measurement dimension of “organizational effectiveness”. It has been separated into four levels, “administrative management effectiveness”, “teachers’ teaching effectiveness”, “students’

performance and achievement”, “parent and community support”. To be this research’s sub-dimension of “school effectiveness variable”, the definition of classification dimension as this research’s “operational definition” was used.

The relationships among school’s organizational change, organizational culture, teachers’ organizational citizenship behavior and school effectiveness

As described previously while formulating organizational change strategies, the decision makers of the school must first change the organizational culture, making the organizational culture more lively and attractive, or communicate and consult thoroughly with organization members who are directly related to teaching or teachers in advance to obtain the organizational commitment from the teachers. Such decision-making views not only avoid serious conflict when implementing the organizational changes, they also enhance organizational effectiveness (Hsu, 2010). In addition, Kezar and Eckel (2002) felt an organization needs a culture that encourages changes. The process of changes could be hindered due to violation of cultural norms, or it could be enhanced via culture.

The results of changes are the revised organizational culture. Huang’s (2009) research found out, “if a strong culture appears in an organization, employees may engage in more culture-related investments. So that when the company wishes to implement the new policy, instead, its organizational culture is not easy to change. If an organization shows a weak culture, although staff participation is usually low, however, when faced with changes, it’s easier to change the organizational culture, and this change will also affect the organizational performance.

As mentioned in the Liu’s (2004) research, excellent organizational culture can enhance efficiency, increase productivity. And organizational culture provides the thinking style for members of an organization. It affects the value judgment and behavior expression within organization of members of an organization. Organ (1988) felt organizational culture and organizational citizenship behavior are closely related. Yen-Nan Wu’s (2003) research results found that a positive relationship exists between a school’s organizational culture and organizational citizenship behavior. Lee’s (2004) research results also showed a significant positive correlation between school’s organizational culture and organizational citizenship behavior. And also a school’s organizational culture also has a predictive power about its organizational citizenship behavior. Secondly, organizational culture and organizational effectiveness are closely related (Wu, 1990). And the research on school effectiveness usually needs to mention a school’s characteristics

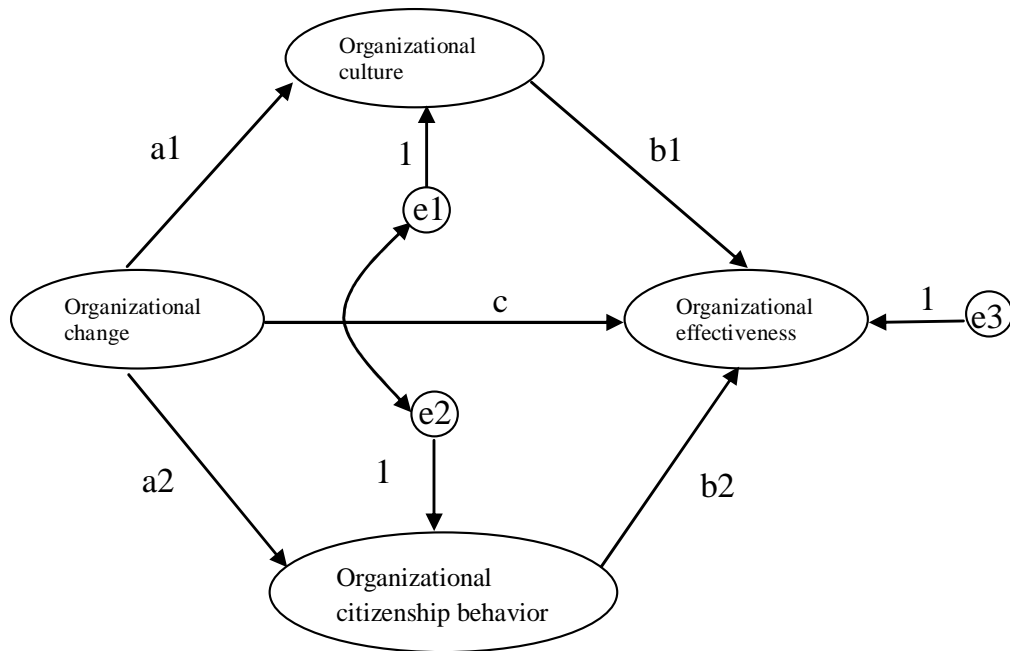


Figure 1. Conceptual research framework.

and culture. Because culture can assist member discover their perception about the organization they belong to, and guide their thinking, feelings and affect their behavior, excellent school organizational culture can have a significant positive correlation with school effectiveness. And a school's organizational culture has a predictive power about the school's effectiveness. Ting (2004), Hsu (2006) found that there was a significant positive correlation between a school's organizational culture and its effectiveness. In addition, Wang (1995) and Kuo (2004) found that there was a positive correlation between the organizational citizenship behavior and the organizational effectiveness. In summary, this research proposes the following hypotheses:

H₁: The case school implemented organizational change and had a significant positive direct effect result.

H₂: The case school implemented organizational change with the teacher's organizational citizenship behavior as the mediating variable and had a significant indirect (mediating) effect on school effectiveness.

H₃: The case school implemented organizational changes with the organizational culture as the mediating variable and achieved a significant indirect (mediating) effect on school effectiveness.

RESEARCH METHOD

Based on the above research motivation, purpose, and literature review, the research hypotheses are deduced. The conceptual research framework of the following research model has been

established as shown in Figure 1.

Questionnaire design

The questionnaire design of the research followed each observable dimension. The "breakdown measurement" method was applied. Likert seven-point scale method was adopted for the measurement of the questionnaire. A 7 to 1 score was given according to the extent of agreement and disagreement. 7 points indicates "extremely agree". 1 point indicates "extremely disagree". The higher the score, the higher the degree of agreement. On the contrary, the lower the score, the lower the degree of agreement. The questionnaire design for organizational change combined the rating scales of organizational change by Lung (2001) and Chin (1996), separated into four variables: mission change, structure change, personnel change and technical change. The questionnaire was designed according to "breakdown measurements". There were four questions for each variable, a total of 16 questions. This research adopted the scale of organizational culture by Sun (2002) for the questionnaire design of organizational culture. The design of questionnaire considered Quinn's (1988) "diagnostic questionnaire for organizational culture" based on "competing values framework". The "organizational culture assessment tools" by Cameron and Quinn (1999) were also revised. The organizational culture was separated into four variables: "consensus culture", "developing culture", "rational culture" and "hierarchical culture". There are six questions for each variable, a total of 24 questions. This research adopted the classification by Hsieh et al. (2010) for the questionnaire design of organizational citizenship behavior. "Organizational citizenship behavior" was separated into four variables: "identifying with the organization", "assisting colleagues", "do not compete for profit and seek private gain", and "professionalism". There are 4 questions for each variable, a total of 16 questions. Because this research focuses on the effectiveness of organizational performance, the classification of effectiveness by Roodsutti and Swierczek (2002) was adopted for the questionnaire design of organizational

Table 1. The number of questions of “implicit variable” and “explicit variable” in the questionnaire.

Implicit variable	Explicit variable	Number of question	Questionnaire references
Organizational changes(X)	Mission changes	4	Chin (1996).
	Structural changes	4	Lung (2001).
	Personnel changes	4	Tseng (2006)
	Technical changes	4	
Organizational culture (ME1)	Consensual culture	6	Quinn (1988).
	Developmental culture	6	Cameron and Quinn (1999).
	Rational culture	6	Sun (2002).
	Hierarchical culture	6	Tseng (2006).
Organizational citizenship behavior (ME2)	Do not compete for profit and seek private gains	4	Hsieh et al. (2010).
	Professionalism	4	
	Identifying with organization	4	
	Assisting colleagues	4	
Organizational performance (Y)	Organizational effectiveness	16	Rodsutti and Swierczek (2002) Sun (2002), Hsi-Min Huang (2004)

performance. The variables were separated into internal orientation and external orientation. Each item was revised into two variables in Sun's (2002) research questionnaire of leadership style, organizational culture and organizational effectiveness under competing values framework (CVF) aiming at Taiwan area technical colleges. There were 8 questions for each variable, a total of 16 questions.

Research framework

The sampling method

This research used convenience sampling to target a technical university in southern Taiwan to carry out questionnaire investigation from full-time teachers (lecturers or above). This research disseminated 10 sets of expert questionnaires as a pilot test. Revisions were made according to the improvement suggestions made by the experts. Post tests were then conducted. 200 sets of questionnaires were officially disseminated. There were 175 valid samples, a sample recovery rate of 87.5%.

Questionnaire data and measurement system

In order to verify the research framework proposed by this research, structure equation modeling (SEM) was adopted to conduct the confirmatory factor analysis (CFA) for the research model framework. This research separated the questionnaire into four latent variables: organizational change, organizational culture, organizational citizenship behavior and organization performance. Each latent variable was separated into the following observable/ explicit variables. There are a few questions for each observable/ explicit variable for the survey. The data collected from the survey were then processed, and the original questionnaire data files were established. As for the establishment of measurement system for this research model, even though questionnaire design followed the method of “breakdown measurement.” taking into account easier processing by computer software, the “repeat measurements”

method was utilized to conduct the measurement (Chen, 2010). Table 1 shows the number of questions in the questionnaire and reference sources of implicit and explicit variables of this research.

RESULTS AND ANALYSIS

Analysis of structural equation model

CFA is an analysis method relative to exploratory factor analysis (EFA). This research conducted CFA on the four unobservable variables (latent variables): “organizational change(s)”, “organizational culture”, “and organizational citizenship behavior”, organizational performance.” And SEM includes structural model and measurement model. It can effectively solve the cause and effect relationship between implicit variable and latent variable. In addition, the model confirmed by this research includes three parts: (1) confirming the goodness-of-fit of the measurement model (2) confirming / verifying the goodness-of-fit of the structure model and (3) confirming/verifying whether the goodness-of-fit of the complete model is consistent with the goodness-of-fit indicator. That is, applying related goodness-of-fit indexes to determine the overall fit of the SEM mode. (Diamantopoulos and Siguaw, 2000).

Analyzing the goodness-of-fit of the measurement model

The factor loading of each latent/implicit variables and manifest/explicit variables was mainly to measure the strength of the linear correlation between the manifest

Table 2. Judgment indicators of measurement model within the model.

Latent variable	Manifest variable	Factor loading	Variance extracted
Organizational changes	x1	0.78	0.63
	x2	0.75	0.59
Organizational culture	ε1	0.73	0.58
	ε2	0.75	0.61
Organizational citizenship behavior	ε3	0.79	0.58
	ε4	0.81	0.59
Organizational effectiveness	y1	0.82	0.57
	y2	0.83	0.58

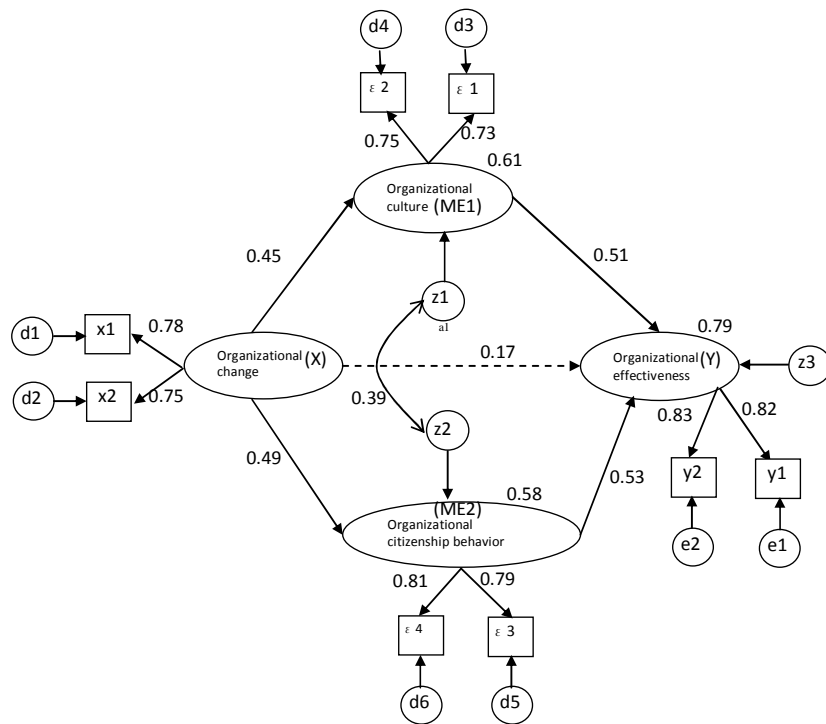


Figure 2. Standardized results of SEM analysis.

variables and latent variables (explicit and implicit variables). The closer the factor loading was to 1, it means the observable variables were more able to measure the unobservable variables. The factor loading of each observable variable of this research was between 0.7 and 0.9. This indicated that it had an excellent reliability. Therefore, the “manifest variables” (that is, explicit variables) within this model’s “measurement system” can all adequately measure the “latent variables” (that is, implicit variables), respectively. In addition, average variance extracted (AVE) is used to calculate the variance

explanation capability of unobservable (latent) variables with respect to each observable variable. The higher the VE value of the latent variable (that is, the unobservable variable), the higher its reliability and convergent validity. Generally, VE value should be greater than 0.5. That is, the variation can be explained as to why the explicit/observable variable is greater than the measurement error (Fornell and Larcker, 1981). The AVE of this study were all greater than 0.5. This indicated that the explicit variables have very high reliability and convergent validity (Table 2 and Figure 2).

Table 3. Path analysis results of the structural model.

Path coefficient between implicit variables		Estimate	S.E.	C.R.	P	Label
Organizational changes (X)	→ Organizational culture (ME1)	0.45	0.02	22.50	***	a1
Organizational culture (ME1)	→ Organizational effectiveness (Y)	0.51	0.03	17.00	***	b1
Organizational changes (X)	→ Organizational citizenship behavior (ME2)	0.49	0.03	16.33	***	a2
Organizational citizenship behavior (ME2)	→ Organizational effectiveness (Y)	0.53	0.02	26.50	***	b2
Organizational changes (X)	→ Organizational effectiveness (Y)	0.17	0.19	0.87		c

Note: * indicates $P < 0.05$, ** indicates $P < 0.01$, *** indicates $P < 0.001$.

Table 4. Path coefficient of determination.

Coefficients of determination	R ²
Organizational changes → Organizational culture	0.61
Organizational culture → Organizational effectiveness	0.79
Organizational changes → Organizational citizenship behavior	0.58
Organizational citizenship behavior → Organizational effectiveness	0.79

Table 5. Evaluation table of the overall model fit.

Determination index	χ^2	DF	GFI	NFI	AGFI	CFI	RMR	RMSEA
Fit value	4.125	1	0.912	0.924	0.906	0.931	0.023	0.035

Analyzing the goodness-of-fit of the structural model

Path analysis results of the structural model

After the confirmation of the goodness-of-fit of the model, this research listed the following results in Table 3. Parameter estimate of each implicit variable, standard error (S.E.) among implicit variables, and critical ratio (C.R.), etc.

The coefficient of determination

The R² value (Squared Multiple Correlation, SMC) is the degree of explanation of each "independent" implicit variable with respect to each "dependent" implicit variable as shown in table 4.

The goodness-of-fit analysis of the overall model

The linear SEM was applied to accomplish the purpose of model building for the research, to study the relation among the latent variables and whether the measurement system has the measurement reliability and the overall goodness-of-fit was measured for this research. The overall goodness-of-fit indicators used to measure this research were χ^2 , d.f., GFI, AGFI, NFI, CFI, RMR, RMSEA, etc. Generally, $\chi^2/d.f. < 5$; $1 > GFI > 0.9$; $1 > NFI > 0.9$; $1 > CFI > 0.9$; $RMR < 0.05$; $RMSEA < 0.05$

(Bagozzi and Yi, 1988). The goodness-of-fit for the overall model of research was $\chi^2/d.f. < 5$. GFI, AGFI and NFI were all greater than 0.90, and RMR value was smaller than 0.05. It showed that the goodness-of-fit of the overall model was good, as indicated in Table 5.

Standardized results of the linear structural equation modeling, SEM

The entire framework of the standardized results after computer execution is shown in Figure 2.

The verification of the path effect analysis of the structural model

Aiming at the path coefficient between each "implicit variable" (or called latent variable) of the structural model, the Sobel Test was done with the MLE, to test whether the direct, mediating effect, and overall effect of the model path was significant. In other words, the research used MLE to conduct the Sobel Test for path effect analysis, with organizational culture (ME₁) and organizational citizenship behavior (ME₂) as the mediating factor. As shown in Table 6, individual indirect effect ($a_1 \cdot b_1$) or ($a_2 \cdot b_2$) was 68.18 and 74.24%, respectively of the overall effect $\{c + (a_1 \cdot b_1) + (a_2 \cdot b_2)\}$. As for the overall indirect (mediating) effect, it was 74.24% of the overall

Table 6. The direct effect, overall indirect (mediating) effect and overall effect of the structural model path.

Path assumption	Direct effect	Overall indirect effect	Overall effect
Organizational changes (X)→ Organizational effectiveness (Y)	0.17(c)	(a1*b1)+(a2*b2)	{c+(a1*b1)+
Organizational changes (X)→Organizational culture (ME1)	0.45(a1)	=(0.45×0.51)+	(a2*b2)}=0.17+
Organizational culture (ME1)→ Organizational effectiveness (Y)	0.51(b1)	(0.49×0.53)=0.49	(0.45*0.51)+
Organizational changes (X)→Organizational citizenship behavior (ME2)	0.49(a2)		(0.49*0.53)=0.66
Organizational citizenship behavior (ME2)→Organizational effectiveness (Y)	0.53(b2)		

effect. Its calculation is as follows:

$$\frac{(a1*b1)+(a2*b2)}{c+(a1*b1)+(a2*b2)} = 74.24\%$$

This indicated that this model has a significant mediating effect and overall effect. However, the direct effect was insignificant. According to the above analysis, the research was able to obtain the following verified results:

1. School organizational change has a positive but insignificant direct influencing effect on the organizational effectiveness. The standardized path coefficient was 0.17. Thus, Hypothesis H₁ obtained some support. (The hypothesis is partially valid)
2. Using teachers' organizational citizenship as the mediating variable, school organizational change has a significant indirect mediating effect. Thus, Hypothesis H₂ obtained support. (The hypothesis is valid)
3. Using organizational culture as the mediating variable, it was verified that the school organizational change had a significant indirect mediating effect on organizational effectiveness. Thus, Hypothesis H₃ obtained support. (The hypothesis is valid).

Conclusions

Through the analysis of the above data and results, the following conclusions have been obtained:

H₁: School's organizational change has a positive but insignificant direct influence on the organizational effectiveness. (The hypothesis is partially valid) This conclusion was partially the same as Organ's (1988) argument. The conclusion was also similar to the argument of Hsu (2010). It also matched with the research discovery by Sun (2002) that the organizational culture has a significant and profound influence on the organizational effectiveness.

H₂: With the teachers' organizational citizenship behavior as the mediating variable, the school's organizational change(s) as having a significant indirect (mediating) effect on the organizational effectiveness was verified (H₂ is valid). This conclusion was partially the same as Lee's (2004) argument. It also has similarity with the argument of Wu (2003).

H₃: With organizational culture as the mediating variable, the school's organizational change having a significant indirect (mediating) effect on the organizational effectiveness was verified. This conclusion is partially the same as the views of Kezar and Eckel (2002), Sun (2002) and Huang (2009).

The contribution of this research

1. The innovative application of research methods: The related literature has been reviewed. Most research was done using multiple regression analysis to do exploratory research. Very few studies used the research framework of confirmatory factor analysis of "one cause, one effect, and two mediating variables". Yet, the primary dimensions of this research subject were unobservable variables (implicit variables); thus, multiple regression analysis was not applicable. CFA and SEM must be used as the research measurement and modeling framework respectively. Therefore, the research methods of this research were relatively innovative.

2. On the practical level: Past scholars' research subjects preferred the exploratory factor analysis (EFA), while this research integrated the related research accomplishments of past scholars and built models to verify the goodness-of-fit of the models. This was to understand whether the models have excellent goodness-of-fit effect. Thus, this research topic is a practical subject of importance in confirmatory factor analysis (CFA). Other than being worthwhile as a reference for future researchers to continue a step further in the related research fields, the research results can be used as a strategic reference when case schools are developing organizational changes. Therefore, this research is an extremely valuable reference.

RESEARCH LIMITATIONS AND SUGGESTIONS

1. Due to the limitation of the research resources, this research adopted, as a basis of convenience, the non-probabilistic convenience sampling; the choice of sampling only considered the convenience of close proximity or measurement. However, the sampling bias was large. The reliability of the results was relatively poor. It is suggested that future researchers can switch to simple

random sampling or stratified random sampling, etc. to derive the samples.

2. This research was a confirmatory type factor analysis. When building the models, the design shall be as concise a confirmatory model as possible, to avoid building models that are too complex thereby causing a poor model fit (Chen, 2010). Thus, this research only considered the impact of organizational changes on organizational performance, with organizational citizenship behavior and organizational culture as the mediating variables.

3. The study was limited to the case of confirmatory factor analysis. Future researchers may consider trying to expand the scope of the study or use it to confirm different industries, to compare how the goodness-of-fit varies using the same model in a variety of industries.

ACKNOWLEDGEMENT

The author thanks the support and encouragement from Takming University of Science and Technology.

REFERENCES

- Bagozzi RP, Yi Y (1988). On the evaluation of structural equation models. *Acad. Mark. Sci. J.*, 16(1): 74-94.
- Cameron KS (1985). Culture congruence strength and type: relationships to effectiveness. Working paper, Business School, University of Michigan.
- Cameron KS, Quinn RE (1999). *Diagnosing and changing organizational culture*. Reading: Addison-Wesley.
- Chan CY (2006). *Crisis Management: a theoretical framework*. Taipei: United Economics Pub.
- Chang CH (2001). The research on the effect of principal transfer, leadership exchange to organizational culture characteristics and organizational effectiveness in primary schools. Kaohsiung city, Taiwan: Fu-Wen primary school (in Chinese).
- Chang HF (2000). The theory and practices of school administration decision-making. Taipei: Wu-Nan Culture Enterprise. (in Chinese)
- Chang TJ (2000). Research on the administration of school education. Taipei: Wu-Nan Culture Enterprise (in Chinese).
- Chen SY (2010). Structural equation model. Taiwan: Psychological Publishing Co., (in Chinese).
- Cheng PH (2003). The research on Taiwan's organizational behavior: past, present, and future. *Appl. Psychol. Res.*, 19 (in Chinese).
- Cheng TF (1998). A study on the application of competing values in the relationship among principal's leadership role, school's organizational culture, and organizational effectiveness in high/vocational schools. Taiwan: Ph.D. dissertation, Education Department, National Kaohsiung Normal University. (in Chinese)
- Chiang TY and Cheng PH (2003). Review and outlook of the research on organizational loyalty, organizational commitment, and organizational citizenship behavior. *Taiwan Appl. Psychol. Res.*, 19: 175-209 (in Chinese).
- Chin CT (1996). The research of organizational change, employees' work characteristics and behavior resistance-with China Ship Building Company as a case study. Taiwan: MS thesis, Institute of Business Administration, National Chung Hsing University. (in Chinese)
- Daft RL (2009). *Organization theory and design*. South-Western College Pub.
- Diamantopoulos A, Siguaw JA (2000). *Introducing LISREL: A guide for the uninitiated*. London: Sage Publications.
- Fornell C, Larcker DF (1981). Evaluating structural equation models with un-observables and measurement error. *J. Mark. Res.*, 18(1): 39-50.
- Hsieh SY, Lang FL, Chen MH (2010). A study on teachers' perception of school's organizational culture, organizational citizenship behavior, and school effectiveness of Kaohsiung county national junior high schools. *Res. Humanities Soc. Sci.*, 4(3): 86-105 (in Chinese).
- Hsu LH (2006). *New theories on classroom teaching of math in primary schools*. Hang Zhou, China: Zhejiang University Press (in Chinese).
- Hsu NH (2010). *Theories and management of organization*. Taipei: Tsang Hai Book Publishing Co. (in Chinese)
- Hsu TJ (2002). A study on organizational research behavior. Taiwan: National Open University. *Open Public Adm. Rev.*, p. 12.
- Hu CS (2007). An educational teaching study on student's learning experience: a case of the Shi-Shin University's course—introduction to propagating industry, 2007 International Conference of Min-Chuan University.
- Huang LH (2009). A study on organizational change, leadership style, organizational culture, and job performance - with three universities in southern Taiwan as case studies. Taiwan: unpublished MS thesis, Department of Business Administration, National Chen Kung University (in Chinese).
- Katz D (1964). The motivational basis of organizational behavior. *Behav. Sci.*, 9(2): 131-146.
- Kezar AJ, Eckel PD (2002). The effect of institutional culture on change strategies in higher education: universal principles or culturally responsive concepts? *J. Higher Educ.*, 73(4): 435-460.
- Kuo IC (2004). A study on the relevant adjustment of variables in the relationship between organizational citizenship behavior and organization effectiveness, Taiwan: MS thesis, Institute of International Business, National Cheng Kung University. (in Chinese)
- Leavitt HJ (1964). *Applied organizational change in industry: structural, technological, and humanistic approaches*. Pittsburgh: Graduate School of Industrial Administration, Carnegie Institute of Technology, .
- Lee CH (2004). Research on the relationship between the school's organizational culture and organizational citizenship behavior—National junior high schools. Tao Yuan county, Taiwan: MS thesis, Institute of Educational Leadership and Development, Fu Jen Catholic University. (in Chinese)
- Lee YT (2002). A study on organizational culture and knowledge sharing—with national primary schools in Taipei county as case studies. Taiwan: MA thesis, Institute of National Education, National Taipei Normal College (in Chinese).
- Liu YF (2004). A study on organizational culture and performance of Kaohsiung county and city Land Administration Offices. Taiwan: MS thesis, Institute of management, I-Shou University (in Chinese).
- Lung SC (2001). The impact of organizational change on technology integration: with advanced manufacturing technology as case study. Taiwan: Ph.D. dissertation, Institute for Operation Research and Management Science, National Chiao Tung University. (in Chinese)
- Organ DW (1988). *Organizational citizenship behavior: the good soldier syndrome*. (Issues in organization and management series) Lexington, MA: Lexington Books.
- Ouchi W (1983). *Theory Z*. Reading, MA: Addison Wesley.
- Peter TJ, Waterman RH (1982). *In search of excellence: lesson from America's best run companies*. New York: Harper & Row.
- Podsakoff PM, Mackenzie SB (1994). Organizational citizenship behavior and sales unit effectiveness. *J. Mark. Res.*, 31(3): 351-363.
- Podsakoff PM, Ahearne M, Mackenzie SB (1997). Organizational citizenship behavior and the quantity and quality of work group performance. *J. Appl. Psychol.*, 82(2): 262-270.
- Quinn RE, Cameron KS (1988). *Paradox and transformation: toward a theory of change in organizational and management*. Cambridge, MA: Ballinger.
- Robbins SP (2003). *Organizational behavior*. New York: McGraw-Hill.
- Rodsutti MC, Swierczek FW (2002). Leadership and organizational effectiveness in multinational enterprises in multinational enterprises in Southeast Asia. *Leadersh. Organ. Dev. J.*, 23(5/6): 250-259.
- Sun JY (2002). A study on leadership style, organizational culture, and organizational effectiveness under the competing values framework—using Taiwan area's technical colleges as examples. Taiwan: PhD dissertation, Management of Business Administration, Taipei University (in Chinese).
- Ting FC (2004). A study on schools' organizational culture and school effectiveness of national primary schools-using Yun Chia areas as

- case study. Taiwan: MA thesis, Institute of National Education, National Chiayi University (in Chinese).
- Tseng HC (2006). A study on the relationship among organizational culture, organizational change, and organizational performance—with the southern region of Chunghwa Telecom as an example. Taiwan: MS thesis, Special Class for Working Professionals, Institute of Engineering Management, National Cheng Kung University (in Chinese).
- Wang TC (1995). A study of the relationship between organizational citizenship behavior and organizational effectiveness – with Chinese invested regular industries as a case study. Taiwan: MS thesis, Institute of Marine Transportation Management, National Marine University (in Chinese).
- Wu YN (2003). The research on organizational culture, organizational climate, and organizational citizenship behavior, Taiwan: MA thesis, Institute of Psychology, Chung Yuan Christian University. (in Chinese)
- Wu CS (2002). A study on school effectiveness. Taipei: Wu-Nan Culture Enterprise (in Chinese).
- Wu PJ (1990). A study on the relationship between organizational culture and organizational effectiveness in national primary schools. Taiwan: MA thesis, Institute of Education, National Kaohsiung Normal University (in Chinese).