The Pennsylvania State University

The Graduate School

Department of Learning and Performance Systems

ORGANIZATIONS' CHARACTERISTICS INFLUENCE ON TEAMWORK AND ORGANIZATIONAL COMMITMENT IN TAIWAN

A Dissertation in

Workforce Education and Development

by

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Submitted in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

May 2009

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ABSTRACT

The purpose of this study was to determine whether or not any association existed between organizations' characteristics and two organizational interventions, teamwork and organizational commitment, in electronics companies and non-electronics companies listed on Taiwan's stock market. In addition, the most significant aspect was to offer an alternative perspective to the interaction between teamwork and organizational commitment modified by organizations' characteristics. Meyer, Allen, and Smith's (1993) three-component conceptualization of organizational commitment and Parker's (1997) team success survey were the two instruments for acquiring the assessment of teamwork and organizational commitment from 131 returned surveys filled out by HRD professionals. Data were first analyzed descriptively and then further checked with necessary estimates for the Structural Equation Modeling (SEM) approach to establish the conceptual models for the electronics and non-electronics companies respectively. The most representative finding from the data indicated that the interaction between teamwork and organizational commitment were highly associated. In addition, for the perspective of regression viewpoint, the most predictable variables for teamwork and organizational commitment were years of establishment, training, ratio of employee tenure, and employee turnover rate. In the end, recommendations for HRD and HRM practice, methodology, and future emerging and valuable research were included.

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ACKNOWLEDGEMENTS

With the completion of my study in Penn State University and this dissertation, I would like to take this opportunity to express my gratitude to those who have helped make what I am today. First and foremost, my sincerest appreciation goes to my family, particularly my parents, Tien-Hsiang Chen and Yueh-Kuei Wang, for their unconditional love, constant encouragement and financial support. Without their endless sacrifice, I could not keep pursuing my higher education in the U.S. during this period.

In the meantime, I am also very grateful to my academic advisor, Dr. Edgar I. Farmer. He is not only my teacher, mentor, researcher, and friend but also a source of guidance and support in my life at Penn State. In addition, without his help and arrangement, I could not have had this wonderful teaching experience at North Carolina Agricultural and Technical State University. There is also another faculty I'd like to give special thanks to. Dr. Edgar P. Yoder, who was also a committee member of mine, has instructed and advised me significantly along the way. Besides the coursework on statistics I've taken with him to advance my statistical capability, he has been very generous in devoting his time and efforts to the overall design of my study, and insightful in giving me his considerations or suggestions regarding my analysis when I was writing my follow-up sections.

Finally, I greatly appreciated Dr. Judith A. Kolb and Dr. Richard A. Walter serving as my other committee members. Their thoughtful suggestions and support always inspired me to make this study more meaningful and useful for the target audience, and to expand this research topic for my future studies.

Although the completion of my dissertation is certainly a milestone in my life up to this point, there remains a lot to be learned in my ensuing career on my research interests. One thing for sure is that without the love from my parents and the help of faculty aforementioned, I would not have achieved this. I will carry on their best wishes and expectations as always to make the best of what I've learned in Penn State in life.

Chapter 1

INTRODUCTION

Historical Perspective

A strong relationship exists between economic development in Taiwan and the changes in the international environment for international trade because the major traffic route in Southeast Asia encompasses Taiwan. Undoubtedly, Taiwan has gradually transformed itself from a small-scale, agriculture-based, island economy to one keeping pace with the demands of intense international competition for economic growth, especially in the past one hundred years (P. C. Chen, 2006; T. J. Cheng, 2001; J. Wong, 2003).

Generally speaking, the economic development in Taiwan succinctly was divided into four periods, and each period had its own historical background and characteristics (P. C. Chen, 2006):

<u>Industrial development before 1940</u>

The major force of economic development in Taiwan in this period had its origins, mostly, from its colonial status with Japan, which included the source of different levels of industrial development between Taiwan and Japan, and the export of agricultural produce to Japan.

<u>Change in industrial structure after World War II</u>

Due to lower wages in Taiwan compared to other developed countries and in a realigned international market, labor-intensive products became the major force of Taiwan's economic development from the 1960s to the mid 1980s.

<u>Economic transformation in the 1980s</u>

Taiwan made a successful transformation by upgrading its industry structures when

faced with internal and external changes of international markets. The obvious challenges were import liberalization, democratization, a bubble economy, competition from countries with lower wages, and monetary depreciation.

Recent upgrades in the manufacturing sector of Taiwan's industries

The demands for industrial development in Taiwan came from its comparably competitive advantage for international consumers. The two advantageous traits influencing industrial upgrades were industrial cluster and management. Particularly in the most recent decade, economic demand in the industrial landscape of Taiwan is more capital-oriented and high-skill-oriented than labor-intensive. For instance, the number of capital-oriented products increased by 89 percent in 1986 to 1997, and the high-skill-oriented products increased by 146 percent (P. C. Chen, 2006; T. J. Cheng, 2001).

Today, it is no exaggeration to say that the most well-known and remarkable impression of Taiwanese industry is the highly developed electronics and information industry exports (J. Wong, 2003). Furthermore, after late 1980s, the workforce of Taiwan has become a supplier of quality human capital with high skills for China and other Southeast countries (T. J. Cheng, 2001). Therefore, due to this increasingly influential role in regional and global economies, companies in Taiwan particularly emphasize internal coordination among different units and external industrial collaboration. As a result, in accordance with these two important orientations, teamwork and organizational commitment have been considered part of the highly promising interventions and have generated much discussion for their potential in organizational development and integration in Taiwan.

The Problem

Three dimensions represented the main problem that this study attempted to investigate: the misapplication of teamwork, the emerging challenge of organizational commitment due to changes in regulation, and the differences of workplace dynamics. Each evolved, individually into a research question, and connected with the others to capture the overall picture of the problem.

The main purpose of this study was to determine the existence of an association between organizations' characteristics in electronics and non-electronics industrial companies on Taiwan's stock market, and of two organizational interventions: teamwork and organizational commitment. In addition to contributing to the field of human resource development, the unique aspect of this study was that it also offered an alternative perspective to the interaction between teamwork and organizational commitment in listed companies in Taiwan.

Presently, teamwork has been recognized by many companies as an important factor influencing organizational effectiveness and efficiency. Nevertheless, organizations were not quite sure what teamwork was and how to apply it satisfactorily in their own contexts. For instance, in order to enhance organizational competitiveness, improve operating systems, or upgrade quality of service, organizations established many different types of teams to deal with various problems: problem-solving teams, cross-functional teams, self-directed teams, or managed-work teams. Unfortunately, the number or the size of teams did not necessarily translate into the expected result. Instead, the key to success teamwork depended on the both internal and external characteristics within an organization, not just the classifications for established teams. In other words, teamwork

was likely to be misconstrued theoretically and implemented inappropriately within organizations.

High-tech companies in Taiwan have been growing rapidly in the past decades due to governmental support and global demand. Profit sharing programs or plans, a strategy in which Taiwanese companies had long issued bonus shares to boost morale and reduce turnover rate among employees, had been considered to be an influential success factor in high-tech companies in Taiwan. This practice was particularly popular among high-tech companies where salaries tended to be lower than their counterparts in the West and Japan. However, starting on January 1, 2008, companies were required to list their employees' bonus shares as expenses in their financial books because the Taiwanese government aimed to better conform to international accounting standards and practices. As a result, organizational commitment became a more compelling challenge because employee turnover rates might rise. For this reason, the study added the ratio of employee profit sharing as an emerging independent variable between the target population and organizational commitment in Taiwan.

Workplace dynamics are changing due to changing demographics within organizations. This demographic variation has an impact on the organizational characteristics and even organizational performance of companies. The demographic changes come from three distinctive generations: baby boomers born 1943 -1960, present working generation Xers, born 1960-1980, and Nexers born 1980-2000 (Raines, Filipczak, & Zemke, 1999, p. 13). The obviously diverse contrasts between these generations are their philosophic values, ambitions, and views toward their professions.

Significance of the Study

Significance that this study generated are as follows:

First, the overarching significance of this study was to broaden and deepen the scope of most of the previous studies on similar topics, which largely focused on the single or regional industrial categories and were analyzed from organizations' background profiles (S. Y. Chen, 2002; Hsu, 2002; Lipinski, 2007; Yang, 1993). This study comprised a much more selected list of companies in broader, more varied industrial categories.

Secondly, given the overview of the methodological preferences in most previous studies, the empirical and qualitative methodologies were primary approaches for research on teamwork and organizational commitment. Therefore, the research aimed to provide an alternative methodological approach to direct similar, future studies toward organizations' characteristics. The approach was to quantify, simultaneously, the two major concepts in a Taiwanese context: teamwork and organizational commitment. This quantitative technique could quickly sketch a comprehensive picture of two investigating variables.

Last, according to available research, most previous theses and journal articles treated similar topics by separately considering these variables, such as types of teamwork, leadership styles, Meyer and Allen's (1991) three-components of commitment, turnover rate, educational levels, and ages (Carson & Bedeian, 1994; T. W. Cheng, 2005; Hsu, 2002; C. Y. Huang, 2002; Y. M. Huang, 2005; Ja, 2006; Jiang, 1999; Kao, 2000; A. Lee, 2004; Lipinski, 2007; Nogradi & Koch, 1981; Parasuraman & Nachman, 1987; Shen, 2005; Shieh, 2004; Steffy & Jones, 1988; Stup, 2006; Thompson, Kopelman, & Schriesheim, 1992; Tseng, 2004; C. C. Wang, 2000; R. Wang, 2000). However, due to differences in organizations' characteristics mentioned earlier, this research attempted to

develop a more comprehensive and up-to-date picture by including new, additional variables, such as capital, earnings per share, and rate of employee profit sharing. Further, the research integrated previously considered variables in order to categorize the specific attributions of individual industrial categories to dependent variables of teamwork and organizational commitment.

Research Questions

This study addressed three research questions in order to guide the acquisition of data to satisfy the requirements of the main problem statement:

1. What is the relationship between the organizations' characteristics and teamwork in electronics and non-electronics industrial companies in Taiwan?
2. What is the relationship between the organizations' characteristics and organizational commitment in electronics and non-electronics industrial companies in Taiwan?
3. To what extent is the relationship between teamwork and organizational commitment among electronics and non-electronics industrial companies in Taiwan modified by organizations' characteristics?

Limitations

Four considerations, which may limit the employed methodology and subsequent findings, remain outside the control of this study: control of the study's time-frame, financial support, and difficulty of data entry, among others. The recognized limitations that may prevent generalization of the results and applications to other contexts or organization relate to specific sections of the study: theoretical foundation, operational definition of variables, and targeted participants.

The narrowed survey targets of this study were the major 584 Taiwanese listed companies on Taiwan's stock market. The sampling list was drawn from the Taiwan Stock Exchange Corporation database, which contains a variety of listed companies' backgrounds and financial information (see http://ww.tse.com.tw/en/). The range of this study would not include companies from two sub-major lists in Taiwan, such as Over-The-Counter (OTC) listed companies and emerging listed companies.

For theoretical foundation, although numerous theories and models were frequently cited for teamwork and organizational commitment, Tuckman's (1965) four stages of team-development model and Meyer and Allen's (1991) three-component conceptualization of organizational commitment were the theoretical foundations for this study. This study would not complicate itself with other, less relevant literature on teamwork and organizational commitment, such as Maslow's Hierarchy of Needs (1943), Belbin's nine team roles (Furnham, Steele, & Pendleton, 1993), MTR-i Team Role Theory developed by Myers Briggs (Pittenger, 1993), and the Dual Process Model developed by Jeongkoo Yoon (Yoon, 2002).

As part of the theoretical foundation, Tuckman's four stages of team-development include forming, storming, norming, and performing; whereas Meyer and Allen's three-component conceptualization of organizational commitment are affective commitment, continuance commitment, and normative commitment. A more comprehensive discussion of the literature is shown in the next chapter.

Regarding the operational definitions of independent variables of organizations' characteristics, this study focused only on the organizations' external and internal profiles, such as the total number of employees, years of establishment, location, capital, earnings per share, rate of employee profit sharing, various aspects of training, various types of

compensation and benefits, ratio of tenure employee, ratio of gender, ratio of employees' education levels, and employee turnover rate. This study would not consider organizations' yearly financial ration, capital formation, monthly shareholdings, monthly turnover, and investment activities as investigative variables.

Regarding the target participants, human resource managers or professionals in each stratified, randomly selected, listed company were queried with a questionnaire. By excluding employees of other positions from participation in this study, the findings and outcomes had their basis in the viewpoints of human resource professionals.

Definition of Terms

A few frequently appearing terms required clarification in advance. They are as follows:

Teamwork: Generally, Larson & LaFasto (1989) referred to teamwork as " a team has two or more people; it has a specific performance objective or recognizable goal to be attained; and coordination of activity among the members of the team is required for the attainment of the team goal or objective" (p. 19).

Organizational commitment: A psychological linkage between an organization and its employees which made turnover less likely was organizational commitment (Allen & Meyer, 1990). In addition, organizational commitment stressed that "commitment is a force that binds an individual to a course of action that is of relevance to a particular target" (Meyer & Herscovitch, 2001, p. 301). Moreover, Baron and Greenberg (2008) stated that "the concept of organizational commitment is concerned with the degree to which people are involved with their organizations and are interested in remain with them"(p. 234).

Listed company: “A listed company is one whose shares are dealt with on a recognized stock exchanges” (Dodge, 1997, p. 485). Besides, according to policies in Taiwan stock exchanges, listed a company should announce its financial information regularly and accept government supervision. For instance, listed companies must release their alternation of sales and capital monthly, seasonally, and annually to the public.

Employee profit sharing: This is “a plan or program for sharing company profits with the firm’s employees” (Rosenbloom, 2005, p. 653). Today, most companies have a definite predetermined formula for allocating the contributions to their employees, and a predefined instrument: stock options, bonuses, or monetary compensations.

Eletronics industrial companies: A company making and selling electronic products or instruments was called an electronics companies, and that it also belonged to the electronics industry. Today, on Taiwan’s stock market, electronics industrial companies are the single largest industrial group compared to other industrial groups and were weighted with a greater portion of capital as well. Based on the classification by the Taiwan Stock Exchange Corporation, electronics industrial companies by definition consisted of some sub- industrial groups: semiconductor, computer and peripheral equipment, optoelectronic, communications and internet, electronic parts/components, electronic products distribution, information service, and other electronics.

Non-electronics industrial compannies: Based on the classification by the Taiwan Stock Exchange Corporation, this industry mainly consisted of 26 industrial categories. In this study, though, non-electronics industrial companies excluded those related to electronics industrial company mentioned above. Consequently, non-electronics industrial companies applicable to this study were as follows: cement, food, plastics, textiles, electric machinery, electrical & cable, chemical, biotechnology and medical care,

glass ceramics, paper pulp, steel iron, rubber, automobile, building material and construction, shipping and transportation, tourism, financial and insurance, department stores, oil, gas and electricity, and others.

Tenure employee: Mayeske (1964) defined that the period for a tenured employee should be longer than 10 years in the same company/organization because that indicated a commitment to an organizational operation and culture.

Earnings per share: This is "the ratio of company's earnings to each share held by investing public" (Siegel, Shim, & Hartman, 1997, p. 103). This study considered the cumulative average of the last 3 years of earnings per share for each selected company.

Assumptions

Several assumptions, based on findings from previous research and first-hand observation were initially proposed here to guide the acquisition of data.

First, the primary assumption was that the listed companies in the non-electronics industrial company ranked higher in organizational commitment than those listed in electronics industrial company. The rationale was that non-electronics industrial company tended to have a longer organizational history, which likely produced more tenured employees.

Second, due to the global status of strategic and crucial supplies from the electronics cluster in listed electronics companies in Taiwan, electronics listed companies may adopt a more advanced concept of teamwork than non-electronics industrial company.

Third, in terms of independent variables of organizations' characteristics, those listed companies with lower employee turnover rate, higher earnings per share, higher rate of employee profit sharing, and complete compensation and benefits packages would possibly represent a higher level of organizational commitment among employees.

Fourth, the remainder of dependent variables: total numbers of employees, year of establishment, location, capital, various aspects of training, ratio of gender, and ratio of education levels, may slightly influence the overall relationship between teamwork and organizational commitment. Based on a logical assessment of relevant literature, a positive correlation existed between teamwork and organizational commitment. The more effective and efficient teamwork was, the higher the degree of organizational commitment.

Theoretical Framework

In accordance with the three research questions, Meyer, Allen, and Smith's (1993) scale of three-component conceptualization of organizational commitment and Tuckman's (1965) model of four stages of team-development were the theoretical foundation for this study.

Meyer, Allen, and Smith's Three-Component Scales of Organizational Commitment

Organizational commitment, generally speaking, is the degree of employees' psychological experience, attitude, job satisfaction, and organizational identification toward their currently employing companies or organizations (Meyer & Allen, 1991; Meyer et al., 1993). Organizational commitment, basically, belongs to the fields of organizational behavior and organizational psychology. Practically, researchers attempted to gauge employees' levels of organizational commitment to predict their job performances, absenteeism, and turnover rate.

Moreover, organizational commitment is a well-developed concept in the field of social science. Consequently, scholars have thoroughly vetted several scales to measure the reality of organizational commitment from diverse industrial perspectives. The most exemplary of this work is a three-component conceptualization of organizational

commitment scale, developed by Meyer, Allen, and Smith (1993). Distinctively, Meyer, Allen, and Smith's scale integrated multitudinous definitions to quantify organizational commitment instead of merely some description of a psychological impression.

Meyer, Allen, and Smith's (1993) scale of a three-component conceptualization of the organizational commitment scale comprises three components: affective commitment, continuance commitment, and normative commitment.

Affective commitment: Employees' positive attachments to the organization "reflects a desire to maintain membership in the organization that develops largely as the result of working experiences that create feelings of comfort and personal competence" (Meyer & Allen, 1991, p. 23).

Continuance commitment: "reflects a need to remain, and results from recognition of the costs (e.g., existence of side bets, lack of alternatives) associated with the leaving" or discontinuing association with the organization (pp. 23-24).

Normative commitment: "reflects an obligation to remain resulting from internalization of a loyalty norm and/or the receipt of favors that require repayment" (p. 24).

Although the organizational commitment could be measured in consecutive order, following the above list and based on Meyer, Allen, and Smith's (1993) frame of reference, these three stages sometimes simultaneously integrate to varying degrees.

Tuckman's Model of Four Stages of Team-Development

Teamwork is the process of team-members working together to create an encouraging climate in order to achieve anticipated organizational goals or tasks. This effort includes several intervening elements: commitment, leadership, communication, problem-solving, goal-setting, motivation, trust, and resources (Dyer, 1995; Dyer, Dyer,

& Schein, 2007). Among those intervening elements, basically, two prerequisites require acknowledgement: First, an efficient team likely encounters a few predictable stages before achieving success. Second, the team-leader and members recognize that these stages are essential to the interactions of team-building.

Consequently, Bruce Tuckman (1965) proposed a four-stage model of team-development for team-growth.

Stage 1. *Forming*.

"Group initially concern themselves with orientation accomplished primarily through testing…to identify the boundaries of both interpersonal and task behaviors" (Tuckman, 1965, p. 13). During this first stage, the leader must set the concentration.

Stage 2. *Storming*.

This stage is "characterized by conflict and polarization around impersonal issues, with concomitant emotional responding…as resistance to group influence and task requirements" (p. 13). In other words, the differences in trust, goals, and roles among group members might engender some crisis.

Stage 3. *Norming*.

"Resistance is overcome…which in-group feeling and cohesiveness develop, new standards evolve, and new roles are adopted" (p. 13). Therefore, the team-members start to cooperate to make progress and success possible.

Stage 4. *Performing*.

"Roles become flexible and functional, and group energy is channeled into task" (p. 13). Previous confusions and issues have been resolved; consequently, team-members support each other and become task-oriented.

Later, in 1977 Bruce Tuckman added an updated fifth stage of team-development, *adjourning*. Definitely, “adjourning involves dissolution. It entails the termination of roles, the completion of tasks and reduction of dependency (Forsyth, 1990, p. 77). However, this adjourning stage invited some criticism from other commentators because they thought this stage was too mourning and stress given toward former team participants. As a result, organizations may need to deal with conflicts or issues of emotional management later. Consequently, the adjourning stage was normally less considered as an extension for Bruce Tuckman’s tem-development model. Therefore, the researcher excluded adjourning as a component of theoretical model for this study.

Chapter 2

REVIEW OF RELATED LITERATURE

The purpose of this chapter was to provide a conceptual framework along with a review of the literature related to the variables in this study: organizations' characteristics, teamwork, and organizational commitment. Mainly, this chapter consists of three sections: teamwork, organizational commitment, and the relationship between teamwork and organizational commitment.

The section on teamwork encompasses definition, types, value of teamwork for organizations, Tuckman's (1965) team-development model, and current studies of teamwork in conjunction with organizations' characteristics. In terms of organizational commitment, the section explores definition, Meyer and Allen's (1991) three-component conceptualization of organizational commitment, and representative studies of organizational commitment in conjunction with organizations' characteristics. The last section is a discussion of the interaction/relationship between teamwork and organizational commitment.

To make the organization of this chapter clearer, the relationship of components of related literature appears in Figure 2-1. As shown, the key component is organizations' characteristics. Teamwork and organizational commitment are two organizational intervention variables. Tuckman's (1965) team- development model and Meyer and Allen's (1991) three-component conceptualization of organizational commitment are the theoretical foundations supporting teamwork and organizational commitment respectively.

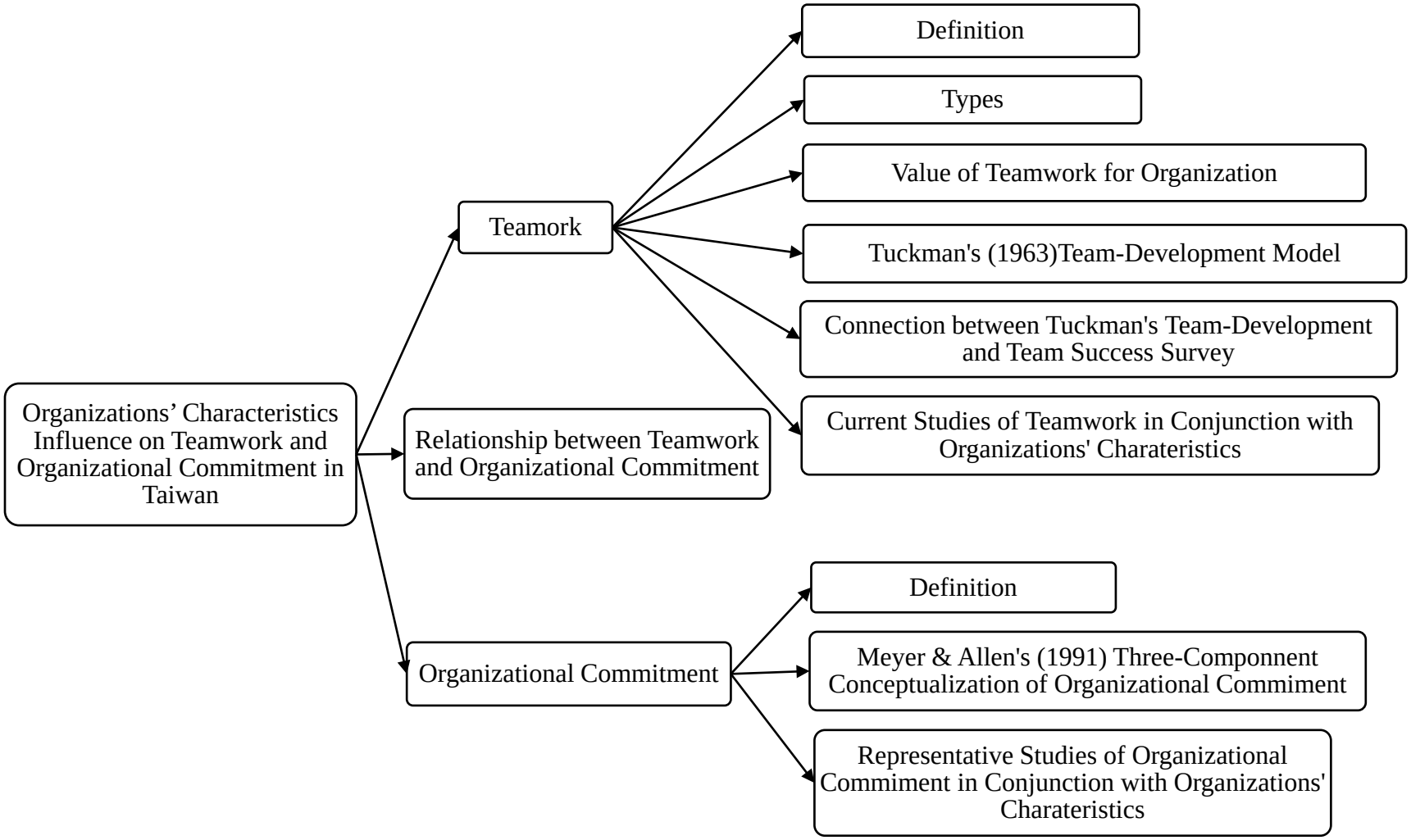

Figure 2-1. The relationship of components of related review literature.

Teamwork

Today, this organizational intervention, teamwork, is regarded as an important for organizational development, effectiveness, and efficiencies. In the early 1960s, teamwork evolved as one organizational intervention for transfer of learning and a source of on-job-training in the workplace (Weisbord, 1988).

Definition

The most important definitions of teamwork were proposed by Richard Beckhard (1969), Don Young and Dave Francis (1992), and Wendell L. French and Cecil H. Bell (1999). Based on their concepts, teamwork was referred to as “a task group whose members are actively interdependent and share the common performance objectives” (Young & Francis, 1992, p. 9) and “enhancing and strengthening the organizations’ internal effectiveness between different units, groups, or councils” (French & Bell, 1999, pp. 155-156). Concurrent with organizational development, theory and intervention, teamwork is the practice of and approach to enhancing group dynamics to implement group self-assessment and to improve selection development (Beckhard, 1969).

Types

People operating with a high degree of interdependence and with the same achievement of goal are a team and work accordingly. However, different organizations with somewhat different degrees of application for accomplishing team goals and tasks may result in various types of teamwork. Glenn M. Parker (2003) proposed that “the three best-known of teams today are functional teams self-directed teams, and cross-functional teams” (Parker, 2003, p. 2). A functional team demonstrates a top-down centralist relationship. This type of relationship, also called the military model, applies in most modern businesses (Parker, 1997, 2003). The most distinguishing characteristic of a functional team is its simple and clear relationship;

therefore, decision-making, authority, and leadership among this team's members stems directly from the team-leader.

A self-directed team, an "autonomous or semiautonomous work team" (Dyer et al., 2007, p. 2) especially applies to rapidly changing environments. The self-directed team has the authority to decide its means to achieve team's tasks and goals, responsibly. Team-members plan and control their work based on their preferences. The most eminent characteristic of a self-directed team is its particularly practical initial stage. For instance, if no historical pathway exists for supervising record, or the needs of power shift, the self-directed team becomes the most appropriate style of teamwork for prosperous implementation (Parker, 1997, 2003).

A cross-functional team, called a multidisciplinary team, is another example of a comprehensive revolution across today's organizations (Dyer et al., 2007; Parker, 1997, 2003). Glenn M. Parker (2003) proposed that a cross-functional team is "composed of those individuals from departments within the firm whose competencies are essential in achieving an optimal evaluation" (p. 4). As a result, a cross-functional team brings six competitive advantages to organizations for successful implementation and management. These advantages are: speed, complexity, customer focus, creativity, organizational learning, and single point of contact (Parker, 1997, 2003).

Value of Teamwork for Organization

More and more regional organizations, national companies, multi-national corporations, profit sectors, non-profit organizations, and government agencies particularly have stressed the critical importance of teamwork and the highly positive outcomes brought by it. What follows are three empirical summaries representing current acknowledgements of recent research on teamwork within organizational development:

1. One of the nine high impact interventions in organizational development was teamwork, which was identified by 21 leaders in organization development from their interviews in a study conducted by Worley and Feyerherm (2003).
2. Teamwork was ranked seventh in the popularity ranking of organizational development research on interventions (Piotrowski & Armstrong, 2004).
3. Based on the perspectives of three cohorts of Chinese executives who attended Executive MBA programs in the United States, teamwork was the most weighty intervention in organizational development, among three other interventions: management by objectives, quality of work life, and career development (Head, Gong, Ma, Sorensen, & Yaeger, 2006).

As the studies above indicated, teamwork has gained recognition as one of the most powerful and important interventions in organizational development. Not surprisingly, its application has spanned many years and continues to be used extensively in various disciplines. Since the goal of teamwork is to improve and enhance the effectiveness and efficiencies of diverse teams within the organization, teamwork also helps group members accomplish tasks and satisfy their needs and expectations, efficaciously. In other words, teamwork not only assists group members to enhance their interpersonal and problem-solving skills, but also it is an effective approach to improving team-building and team performance (Bell & French, 1999; Cummings & Worley, 2001; McLean, 2005)

Tuckman's (1965) Team-Development Model

Teamwork is a vehicle and process for assuring team-members to work together harmoniously, productively, effectively, and efficiently to maximize accomplishment of tasks and goals (Payne, 2001). Therefore, in order to achieve the anticipated tasks and goals, teamwork encompasses six intervening steps of the process (see Figure

2-2): identify the need, gain the commitment, assess needs and give feedback, lead the teamwork session, implement the results, and evaluate the impact (Dyer, 1995; Dyer et al., 2007; Payne, 2001). Among those intervening steps, basically, two prerequisites should be acknowledged. First, a successful team should include a few predictable stages before its commencing. Second, both team-leader and members should recognize that these stages are essential to the interaction of teamwork.

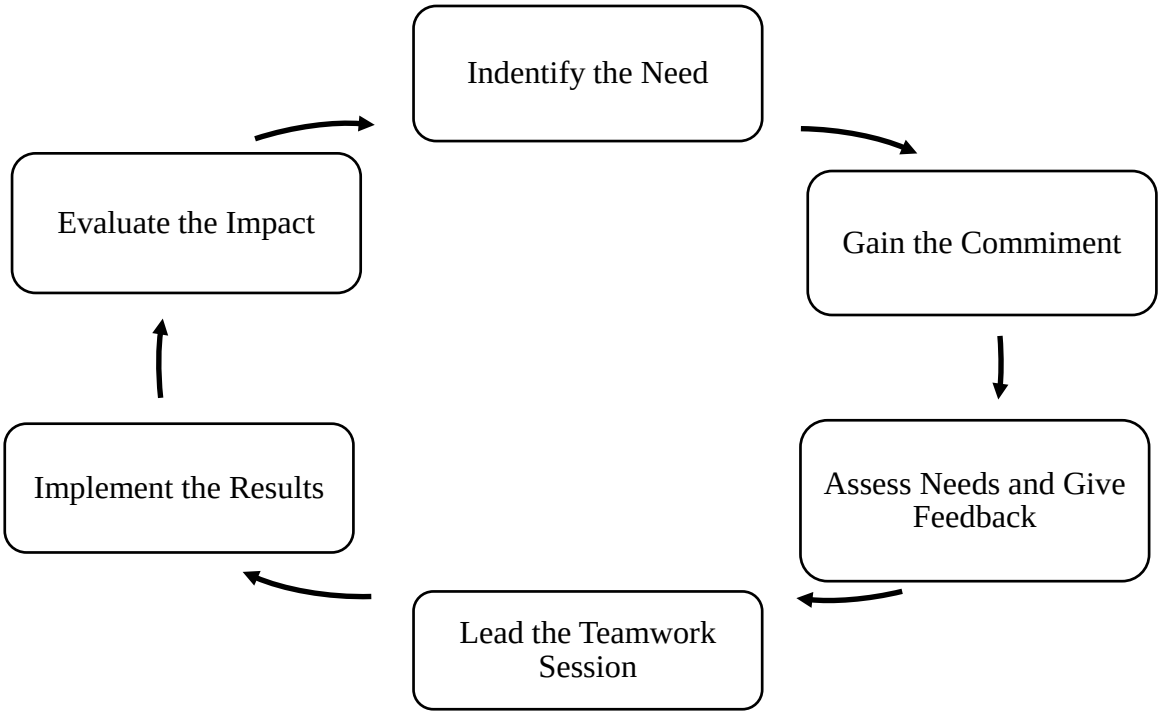

Figure 2-2. The six intervening steps of the process of teamwork.
From "Team-building workshop: A trainer's guide," by Vivette Payne, 2001, Amacom Books, p. 5.

As a result, Bruce Tuckman (1965) proposed a four-stage model of team-development model for team-growth (see Figure 2-3).

Stage 1. *Forming*.

A team is initially oriented to and begins collecting team-members' issues and atmosphere. Hence, the enthusiasm for the commitment is high whereas the competence is low. Therefore, the team-leader must set the concentration (Goncalves, 2006; Tuckman, 1965).

Stage 2. *Storming*.

Conflicts, polarization, personal issues, emotional response infuse the team (Tuckman, 1965). As a result, the commitment between individual team-members temporarily lapses.

Stage 3. *Norming*.

This phase begins the team's accomplishment of its anticipated tasks and goals because team-members are overcoming their resistances. Therefore, team-members collaborate with each other and aim to make the whole progress as successful as possible (Goncalves, 2006; Tuckman, 1965).

Stage 4. *Performing*.

Due to the team-members' support and cooperation, the team officially becomes a task-oriented group. In other words, the team is fully mature, effective, and efficient, and the team can consistently deal with any challenges and conflicts. Consequently, "group energy is channeled into task" (Tuckman, 1965, p. 13).

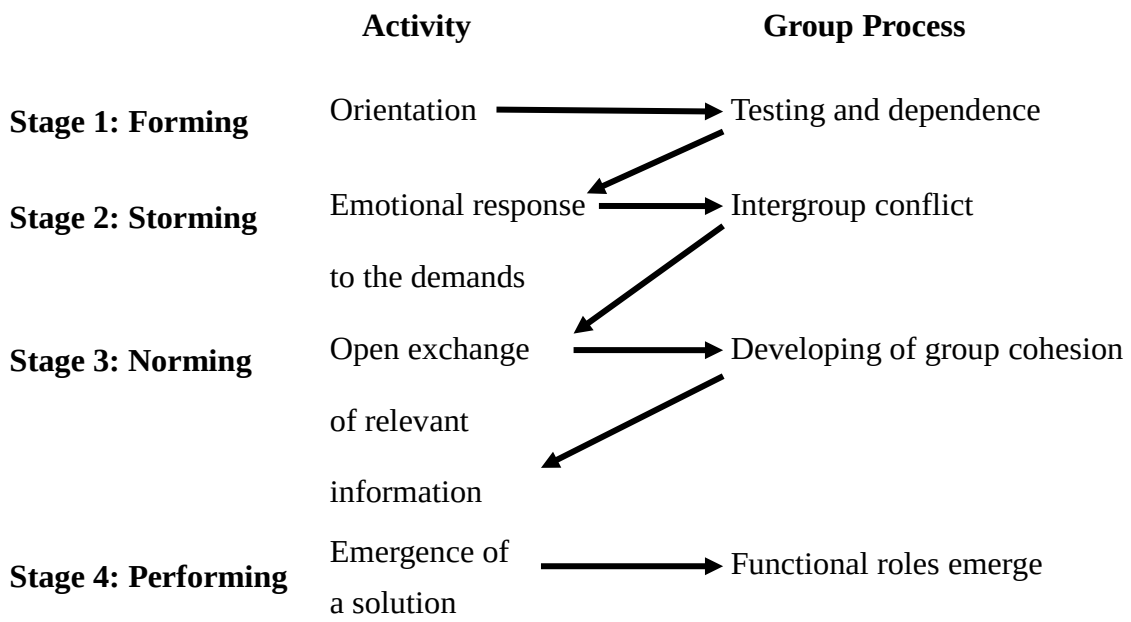

Figure 2-3. Bruce Tuckman's (1965) four-stage team-development model.

From "Team-building," by Marcus Goncalves, 2006, American Society Of Mechanical Engineers, p. 4.

Connection between Tuckman's Team-Development Model and Team Success Survey

Many theories or models of teamwork often are inclined to be one dimensional. For instance, some work focused on team-leadership; some emphasized team-culture, and others concentrated on interpersonal relationships. However, such partial emphasis sometimes may disregard the comprehensive picture of teamwork (Parker, 1997, 2003).

To improve this misrepresentation, Glenn M. Parker (1997) identified three components contributing and influencing the effectiveness and efficiencies of teamwork, which echoes Tuckman's (1965) four-stage team-development model. These three components also constructed the second section of the instrument for this study. The details of three components are (Parker, 1997, 2003):

1. *Internal processes – Forming and storming*.

The conflicts, decision-making, communication, and trust are the main factors of interpersonal relationships and group dynamics in teamwork.

2. *Team Structure - Norming*.

Individual roles in a team, the team's goals and tasks, and external relations are considered team-structure.

3. *Organizational support - Performing*.

Empowerment, training, rewards, and management support are regarded as elements, energy, and maturation of teamwork.

Current Studies of Teamwork in Conjunction with Organizations' Characteristics

The study of teamwork has been well discussed as a type of organizational intervention encompassing various topics and diverse fields, such as different types of teamwork, group-assessment, leadership style, team-culture, interpersonal relationships, and team demographics. Nevertheless, due to the focus on the independent variables for this study, organizations' characteristics, consideration of

the literature narrowed to studies with two criteria: those focused on Taiwan as the research context and the important journal articles published from 2000 to 2008 (see Table 2-1).

According to the outcomes from previous studies, different demographic variables were investigated for their impact on teamwork, and various findings were presented. Generally speaking, in teamwork, a positive influence arose from various aspects of training and tenured employees (Chan, 2003; Chien, 2003; Ja, 2006; Jian, 2002). Furthermore, an obvious difference arose from employees' educational levels (Y. C. Lee, 2001). However, in terms of the variables, like age and gender, previous research findings were inconclusive. Kang, Yang, and Rowley (2006) reported the relationship between teamwork and demographic aspects to be positive, but Ja (2006) and Chowdhury (2005) found the relationship was neutral. Table 2-1 presented further details of each study.

Table 2-1

Research Findings between Teamwork and Organizations' Characteristics

Studies	Organizations' characteristics	Results
Yueh Chiang Lee (2001)	Employees' education levels	Difference between educational background and trust
Yu Jun Jian (2002)	Various aspects of training	Positive effects on organizational support, diverse layer of age, and proper training
Yu Chuan Chien (2003)	Tenured employee	Positive influence in empowerment and trust
Ya Wen Chan (2003)	Various aspects of training	Positive effect on type of training
Sanjib Chowdhury (2005)	Age, gender, functional background	Not important for team effectiveness
Ling Ling Shen (2005)	Tenured employee	Lower conflict with diverse layers of age
Fu Ching Ja (2006)	Gender, tenure employee	No relationship between genders Positive relationship on tenured employee
Hye Ryun Kang Hee Dong Yang Chris Rowley (2006)	Demographic aspects (age, gender, turnover)	Positive influence from demographic aspects

Unfortunately, these studies did not focus much on organizations' characteristics. The investigated variables were primarily employees' education levels, gender, number of tenured employees, and various aspects of training. In other words, current

studies disregarded other important factors that might have the potential to influence the effectiveness and efficiency of teamwork, such as industrial category, years of establishment, location, capital, earnings per share, employee profit sharing, and various types of compensation and benefits.

Organizational Commitment

Organizational commitment, a well-developed concept in the field of social science, has numerous propositions and has undergone much study. The most important and significant fundamental research, concepts, and development are the contributions of John P. Meyer and Natalie J. Allen (Allen & Meyer, 1990; Meyer & Allen, 1991; Meyer et al., 1993; Meyer, Becker, & Vandenberghe, 2004; Meyer & Herscovitch, 2001). Therefore, the following sub-sections on organizational commitment obtain their specifics mainly from the work of Meyer and Allen.

Definition

Organizational commitment is the result of psychological linkages, experiences, attitudes, job satisfaction, and identifications, between organization and employee (Allen & Meyer, 1990; Meyer & Allen, 1991; Meyer et al., 1993). Typically, higher organizational commitment results in lower turnover rate. Further, organizational commitment is also considered the degree of involvement in which employees persist and concerns their integration into their organizations (Baron & Greenberg, 2008; Meyer & Herscovitch, 2001).

Meyer and Allen's (1991) Three-Component Conceptualization of Organizational Commitment

Although organizational commitment has been a much discussed topic in organizational development in recent years, the most exemplary, indentified, and systematic work is that of Meyer and Allen's (Meyer & Allen, 1991; Meyer et al., 1993) three-component conceptualization of organizational commitment. The

three-component conceptualization of organizational commitment included affective commitment, continuance commitment, and normative commitment. Distinctively, Meyer and Allen's three-component conceptualization of organizational commitment explored not only psychological impressions but also integrated, multitudinous dimensions of organizational commitment. The itemized descriptions of the each commitment are:

1. *Affective commitment*

Affective commitment "refers to the employee's emotional attachment to, identification with, and involvement in the organization. Employees with a strong affective commitment continue employment with the organization because they want to do so" (Meyer & Allen, 1991, p. 67).

2. *Continuance commitment*

Continuance commitment "refers to an awareness of the costs associated with leaving the organization. Employees whose primary link to the organization is based on continuance commitment remain because they need to do so" (Meyer & Allen, 1991, p. 67).

3. *Normative commitment*

Normative commitment "reflects a feeling of obligation to continue employment. Employees with high levels of normative commitment feel that they ought to remain with organization" (Meyer & Allen, 1991, p. 67).

Representative Studies of Organizational Commitment in Conjunction with Organizations' Characteristics

In discussing the research of the relationship between organizational commitment and organizations' characteristics, the research basically narrowed the literature review to representative journal articles published in various contexts from countries worldwide. Because organizational commitment is an often considered topic

in the field of social science, previous studies in these recognized journals contained various variables, such as job satisfaction, job position, reward, subjective and objective performance, managerial strategy, role clarity, organizational structure, organizational climate, and productivity (Brewer & Ko, 1995; Leung, 1997; Palich, Hom, & Griffeth, 1995; Putti, Aryee, & Liang, 1989; Sommer, Bae, & Luthans, 1996; Tjosvold, Sasaki, & Moy, 1998; C. Wong, Hui, Wong, & Law, 2001). However, the focus of the current study is organizations' characteristics as listed in Chapter 1. Therefore, this research selected only highly relevant studies for discussion concurrent its topic.

Based on the previous studies related to organizational commitment, only few of the variables related to this research's thirteen organizational characteristics were discussed. These limited, yet typical variables were: age gender, education, tenure, turnover, training, and organizational size.

In previous representative studies, which considered the variables of age, gender, education, tenure, and turnover, they did not exactly present consistent research findings (see Table 2-2). For instance, in terms of gender, Alvi & Ahmed (1987), Cohem & Gattiker (1992) and Chen & Francesco (2000) found that gender had a significant impact on organizational commitment. To the contrary, Putti, Aryee, & Liang (1989), Sommer, Bae, & Luthans (1996), Harrison & Hubbard (1998), Chang (1999), Cheung (2000), and Wong, Hui, Wong, & Law (2001) nevertheless reported the opposite results. On the other hand, Alvi & Ahmed (1987) particularly indicated that the organizational commitment among female workers was greater than that among males.

In reference to age, some previous studies concluded, similarly, that age was related to organizational commitment (Cheung, 2000; Cohem & Gattiker, 1992; Harrison & Hubbard, 1998; C. Wong et al., 2001); whereas, others did not indicate any association (Chang, 1999; Kao, 2000; Putti et al., 1989; Sommer et al., 1996).

With regard to turnover, the most conclusive finding from previous representative studies in organizational commitment reported turnover was negatively associated with organizational commitment (X. Z. Chen & Francesco, 2000; C. Wong et al., 2001), but other studies did not report a similar finding (Cheung, 2000). As to the variable of tenure, only Chang (1999) summarized the variable of tenure as being related to continuance and affective commitment as two basic components in Meyer and Allen's (1991) three-component conceptualization of organizational commitment. In terms of the variables of education and training, few scholars believed education was significant for organizational commitment (Cohem & Gattiker, 1992; Putti et al., 1989). Nevertheless, only Chang (1999) predicted training to be connected to affective commitment; other studies did not.

In sum, according to the findings from the previous studies in organizational commitment, age and turnover were the most relevant variables related to organizational commitment. In the meantime, the variables, training, tenure, education, had slight impact on organizational commitment. Hypothetically speaking, what these previous studies lacked in their designs was exclusion or lack of consideration for other updated demographic variables such as years of establishment, industrial category, location, capital, earnings per share, various types of compensation and benefits, and employee profit sharing. For this reason, in this study, such variables with the potential to influence organizational interventions were included.

Table 2-2

Research Findings between Organizational Commitment and Organizations' Characteristics

Studies	Country examined	Organizations' characteristics	Results
Alvi & Ahmed (1987)	Pakistan	Age, gender, education, tenure	Female workers greater than male workers.
Putti, Aryee, & Liang (1989)	Singapore	Age, gender, education, tenure	Only significance on level of education
Cohem & Gattiker (1992)	Canada U.S.	Age, gender, education, tenure	Level of education affected Commitment in U.S. only Age and gender effect in Canada more than U.S.
Sommer, Bae, & Luthans (1996)	Korea	Age, education, tenure, organizational size	Significant contribution to organizational size
Gregersen & Black (1996)	Japan	Tenure, training	None
Harrison & Hubbard (1998)	Mexico	Age, gender, tenure, education	Age related to commitment
Chang (1999)	Korea	Age, education, training, tenure	Tenure prediction of continuance commitment Training and tenure prediction of affective commitment
Chen & Francesco (2000)	China	Age, gender, education, tenure, turnover	Significant contribution to turnover and gender

Table Continued

Cheung (2000)	Taiwan	Age, gender, education, tenure	Only age related to commitment
Kalleberg & Mastekaasa (2001)	Norway	Age, gender, education, turnover	None
Wong, Hui, Wong, & Law (2001)	China	Age, gender, turnover, tenure	Age related to commitment. Turnover negatively related
Wong, Hui, Wong, & Law (2001)	Hong Kong	Turnover	Commitment negatively related to turnover

Relationship between Teamwork and Organizational Commitment

While undeniably individual organizational intervention like teamwork or organizational commitment has been investigated respectively in diverse contexts, little deserved attention or serious interest accrued to the effect of a combination of interactions among these interventions. This lack of inquiry might also explain the disconnection between the interventions and organizational effectiveness concluded in quite a few empirical studies. An obvious instance is frequently seen in the employers' misconceptions of the absolute advantage of teamwork. For a long time, the reason more and more organizations were utilizing teamwork as the sole organizational intervention was that employers believed teamwork could reach organizational goals and tasks more effectively and efficiently (Bishop & Scott, 1997, February 1).

Furthermore, the belief was that employees would have more opportunities to become involved in the decision-making process and accept a more active role. Unfortunately such a belief missed the key point for the expected success since teamwork was also established upon a high level of individual organizational

commitment toward teams and organizations. A similar lack was evident in current empirical studies as well.

Up to this point, the most logical argument for the link between teamwork and organizational commitment is still limited in scope. The exploration of interaction and complication between teamwork and organizational commitment has been limited. Generally speaking, the sensible assumption was that employees' organizational commitment to their teams and organizations influenced their turnover, willingness, productivity, and team performance because team-members were willing to collaborate with each other (Bishop & Scott, 1997, February 1).

Bishop & Scott (1997, February 1) reported that "task interdependence had positive and significant influences on both organizational and team commitments" (p. 108). For instance, when the level of team and organizational commitment lowered, the intention to leave employment rose. In addition, few scholars proposed that organizational commitment to a team may transfer into willingness to assist team-members (Becker & Billings, 1993) and improved team performance (Scott & Townsed, 1994, August 1). Lower commitment to both the organization and the team linked to absenteeism, turnover, and intention to leave employment (Becker & Billings, 1993; Mowday, Porter, & Steers, 1982).

As discussed above, both team commitment and organizational commitment, respectively had significantly positive impacts on organizational and team performances. Therefore, Bishop & Scott (1997, February 1) suggested strategies to enhance and strengthen commitment both at organizational and team levels:

1. Train first-level supervisors to be visible and alert to teams' needs (p. 111).
2. Engage teams in teamwork exercises and training because this increases commitment to the team by increasing members' satisfaction with each

other by reducing intersenders conflict (p. 111).

3. Pay close attention to production procedures and technical and team training for employees (p. 111).

Chapter Summary

Organizational commitment and teamwork were productively studied in the social science field. Among them, the most significant contributions were the analysis from Tuckman's (1965) four-stage team-development model and Meyer and Allen's (1991) three-component conceptualization of organizational commitment. Respectively, Tuckman's (1965) four-stage team-development model comprised of forming, storming, norming, and performing, and Meyer and Allen's (1991) three-component conceptualization of organizational commitment included affective comment, continuance commitment, and normative commitment.

Empirical studies which were based on either intervention concept essentially provided an inadequate and inconclusive picture of the real value of teamwork or organizational commitment. In other words, previous studies focused more on the relationship between demographic information and teamwork or organizational commitment. The typical protocol for demographic variables such as age, gender, education, tenure, and training, had quite limited consideration as well. Nevertheless, these studies did not conclude with consistent results. For instance, Kang, Yang, and Rowley (2006) indicated the relationship between teamwork and demographic aspects was positive, but Ja (2006) and Chowdhury (2005) found the relationship was neutral. Alvi & Ahmed (1987), Cohem & Gattiker (1992) and Chen & Francesco (2000) found that gender had a significant impact on organizational commitment. To the contrary, Putti, Aryee, & Liang (1989), Sommer, Bae, & Luthans (1996), Harrison & Hubbard (1998), Chang (1999), Cheung (2000), and Wong, Hui, Wong, & Law (2001) reported the opposite results.

Finally, the study of interaction between teamwork and organizational commitment on the grounds of the larger scope of organizations' characteristics is obviously in need of more empirical evidence. So far, the most relevant assumption was that task interdependence brought a significant positive impact on organizational commitment and team commitment (Bishop & Scott, 1997, February 1).

Chapter 3

METHODOLOGY

This chapter discusses the relevant sections: the problem, research questions, measurement, variables, instrumentation, data collection, and data analysis.

The Problem

The main purpose of this study was to determine the existence of an association between organizations' characteristics in electronics and non-electronics industrial companies on Taiwan's stock market, and of two organizational interventions: teamwork and organizational commitment. In addition to the contribution to the field of human resource development, unique to this study was that it also offered an alternative perspective for the interaction between teamwork and organizational commitment in listed companies on Taiwan's stock market.

The landscape of this study was succinctly pieced together from three aspects: the misapplication of teamwork, the emerging challenge of organizational commitment due to changes in regulations, and differences in workplace dynamics. These three complement each other to more comprehensively capture the essence of the overarching research question in this study.

The misapplication of teamwork for its contribution to organizational objectives became a crucial and timely issue for those who practiced teamwork. Today, collaboration has been given increasing attention and attributed with different levels of significance in diverse disciplines. For instance, due to the differences of industrial cluster categorizations, regionally and internationally, a single organization was no longer able to produce products without collaborating with other external entities. On the

personal level, because of the specification and development of occupational professionalism, individuals' completing organizational tasks successfully without collaborating with others was becoming increasingly difficult. As a result, currently, the effectiveness and efficiency of teamwork garnered a great amount of attention from many Taiwanese companies who had considered teamwork an important approach to accomplishing organizational objectives. However, companies seemed to have barriers to, or misapplications of, appropriate dimensions of teamwork in their own contexts. Two commonly seen missteps were that companies may select improper leadership styles for teamwork or miscalculated the suitable size of teams for intended objectives or tasks.

Organizational commitment is facing an emerging challenge in Taiwan since the beginning of 2008. Historically, among the well known strategies from highly accomplished, high-tech companies in Taiwan, one successful component had been profit sharing programs for employees. Nevertheless, due to official changes in accounting standards and practice, beginning January 1, 2008, companies must regard profit sharing programs as expenses rather than bonuses and must list such expenses in companies' financial records. In order to mitigate the impacts brought by this new regulation and to lower operating costs, simultaneously, companies reacted by reducing employees' benefits, especially in terms of stock options and annual bonuses. As a result, the employees' organizational commitments became an anticipated topic with regard to organizational development. For this reason this research added profit sharing, an independent variable, to the others when analyzing organizational commitment.

In the meantime, the demographics of organization are changing, and this change is affecting organizational characteristics, as well. This demographic change results from

the ongoing retirement of baby boomers born, 1943 to 1960, presently employed generation Xers born, 1960 to1980, and Nexers born, 1980 to2000 (Raines et al., 1999). Generally speaking, this cross-generational workplace dynamic may invite some foreseeable conflicts, especially in areas such as values, ambitions, and views. These distinctive generational differences in organizational characteristics have influenced the applications of teamwork and organizational commitment.

Research Questions

This study sought to answer to three research questions to satisfy the problem statement of this research:

1. What is the relationship between the organizations' characteristics and teamwork in electronics and non-electronics industrial companies in Taiwan?
2. What is the relationship between the organizations' characteristics and organizational commitment in electronics and non-electronics industrial companies in Taiwan?
3. To what extent is the relationship between teamwork and organizational commitment among electronics and non-electronics industrial companies in Taiwan modified by organizations' characteristics?

Measurement

Population

"Population is an individual or group that represents all the members of a certain group or category of interest" (Urdan, 2001, p. 1). To probe this term more closely, especially for the practice of methodological concept, population may also comprise four characteristics for different probability sampling techniques (Ormrod & Leedy, 2005):

1. Generally a homogeneous group of individual units.
2. Roughly equal in size.
3. Proportions within the population.
4. Each discrete cluster with similar characteristics is heterogeneous in the overall population.

The target population for this study was the total number of listed companies on Taiwan's stock market. As of July 28, 2008, 584 listed companies, divided into 30 groups populate the indexes (see http://ww.tse.com.tw/en/). The 30 indexed groups included: cement, food, plastics textiles, electric machinery, electrical & cable, chemicals, biotech and healthcare, chemical, biotechnology and medical care, glass and ceramics, paper pulp, steel and iron, rubber, automobile, electronics, semiconductor, computer and peripheral equipment, optoelectronics, communications and internet, electronic parts/components, electronic products distribution, information services, other electronics, building materials and construction, shipping and transportation, tourism, financial and insurance, department stores, oil, gas and electricity, and others.

Particularly, due to unique industrial characteristics and developments in Taiwan, the electronics industry category contains great numbers of listed companies and also comprises numbers of sub-electronics industries. Generally speaking, these sub-electronics industry companies are part of the one industry category, electronics, in anticipation of investigating overall industrial types in the Taiwanese stock market.

With such categorization, among these 30 indexed groups, all are usually further classified into 19 broad industrial categories: cement, food, plastics textiles, electric machinery, electrical and cable, chemicals, biotech and healthcare, chemical industry,

biotechnology and medical care industry, glass ceramics, paper pulp, steel iron, rubber, automobile, electronics, building materials and construction, shipping and transportation, tourism, financial and insurance, department stores, oil, gas and electricity industry, and others. Normally and traditionally, these labor-intensive and financial service industrial companies are regarded as non-electronics companies in Taiwan. Consequently, based on the industrial classification, the researcher divided listed companies on Taiwan's stock market to two industrial categories for this study: electronics companies and non-electronics companies. The rate and exact number of listed companies for each industrial category appears in Table 3-1.

Table 3-1

Distribution of Each Industrial Category of Listed Companies in Taiwan

Industrial type	Number	Proportion (%)
Electronics companies		
Electronics	220	38
Non-electronics companies		
Cement	7	2
Food	19	3
Plastics	19	3
Textiles	50	4
Electric machinery	33	6
Electrical & cable	14	2
Chemical	32	6
Glass ceramics	7	2
Paper pulp	7	2
Steel iron	26	4
Rubber	9	2
Automobile	5	2
Building materials and construction	28	5
Shipping and transportation	16	3
Tourism	6	2
Financial and insurance	36	6
Department stores	13	2
Other	37	6
Total	584	100

Note. The source is from Taiwan Stock Exchange Corporation, retrieved on July 28, 2008.

Sample

"A sample is a subset drawn from the large population" (Urdan, 2001, p. 1). Similarly conceptualized as the population, the sampling can be primarily classified into two main categories: probability sampling and non-probability sampling. Plus, each category comprises a few sub-components. For instance, probability sampling includes simple random sampling, stratified random sampling, proportional stratified sampling,

cluster sampling, and systematic sampling. Non-probability sample entails convenience sampling, quota sampling, and purpose sampling (Ormrod & Leedy, 2005).

According to the characteristics and distribution of populations and the three research questions, the sampling technique for this study was proportional stratified sampling. Based on the methodological definition, proportional stratified sampling is "used when the number of subjects selected from each stratum is based on the percentage of subjects in the population that have the characteristics used to form the stratum" (McMillan, 2000, p. 106). Thus, the proportional stratified sampling was the most sensible sampling procedure to connect the natures of the target population.

In addition, based on Krueger's proposition (2001), the estimating sample size, given a 95% confidence level of population size of the total 584 participants, is 234 (p. 250). Since 19 general industrial categories populate the overall listed companies on Taiwan's stock market, Table 3-2 displays the distributed result of the sampling number in each industrial category of electronics companies and non-electronics companies.

Finally, the method for selecting random samples by utilizing proportional stratified sampling was to take advantage of a particular internet tool called Research Randomizer (see http://randomizer.org/form.htm). This website is particularly useful for researchers who want a quick way to generate random numbers or assign participants to experimental conditions. JavaScript is the core technique of Research Randomizer's generation of customized sets of random numbers. Hence, according to input sets of numbers per set the resulting random sample appears in the next browser automatically and immediately.

Table 3-2

Distribution of Each Industrial Category of Sample

Industrial type	Sample	
	Size	Proportion (%)
Electronics companies		
Electronics	88	38
Non-electronics companies		
Cement	5	2
Food	7	3
Plastics	7	3
Textiles	9	4
Electric machinery	14	6
Electrical & cable	5	2
Chemical	14	6
Glass ceramics	5	2
Paper pulp	5	2
Steel iron	9	4
Rubber	5	2
Automobile	5	2
Building material and construction	12	5
Shipping and transportation	6	3
Tourism	5	2
Financial and insurance	14	6
Department stores	5	2
Other	14	6
Total	234	100

Variables

Independent Variable

"A variable that the researcher studies as a possible cause of something else - in many cases, this is one that the research studies directly manipulates – is called an independent variable" (Ormrod & Leedy, 2005, p. 218).

The independent variables for this study were drawn from external and internal patterns of organizational characteristics. They included the total number of full-time

employees, years of establishment, industrial category, location, capital, earnings per share, rate of employee profit sharing, various aspects of training, various types of compensation and benefits, ratio of tenured employees, ratio of gender, ratio of employees' educational levels, and employee turnover rate. Consequently, Table 3-3 displays the scale of measurement for each independent variable.

Table 3-3

The level and scale of measurement of independent variables

Independent variable	Scale of measurement
Total number of employees	Interval/Ratio
Years of establishment	Nominal
Industrial category	Nominal
Location	Nominal
Capital	Interval/Ratio
Earnings per share (%)	Interval/Ratio
Employee profit sharing (%)	Interval/Ratio
Various aspects of training	Interval/Ratio
Various types of compensation and benefits	Interval/Ratio
Ratio of employee tenure (%)	Interval/Ratio
Gender ratio (male/female)	Interval/Ratio
Educational levels (high/low)	Interval/Ratio
Employee turnover rate (%)	Interval/Ratio

Dependent Variable

"A variable that is potentially influenced by the independent variable" is called a dependent variable (Ormrod & Leedy, 2005, p. 218).

The two primary dependent variables of this study were teamwork and organizational commitment. The foundation of the instrument for this study was adopted from the three-component conceptualization of organizational commitment scale (Meyer et al., 1993) and the team success survey (Parker, 1997). Both of instruments use a 7-

point, Likert-type format. Therefore, the scale measurement of the dependent variables for this study was ordinal-type data.

Instrumentation

Since this study was a quantitative study, the adopted instrument was the core technique to acquire the necessary information to answer the three research questions. Therefore, the developed instrument was utilized in terms of the quantification of teamwork and organizational commitment in accordance with the topic of this study. Furthermore, the study integrated the two developed instruments as the first two sections of instrument to measure these two concepts of dependent variables. The third section of the instrument was original to this study.

Organizational Commitment

In terms of organizational commitment, the most structural, integral, and well-known instrument is the three-component conceptualization of organizational commitment scale, developed by Meyer, Allen, and Smith (1993). It consists of three sections: affective commitment scale, continuance commitment scale, and normative commitment scale. Throughout the years, a significant number of scholars conducting research regarding organization commitment have adopted this instrument or used it as a template.

Historically, the fundamental concepts of the three-component conceptualization of organizational commitment scale were derived from Organization Commitment Questionnaire developed by Mowday, Steers, and Porter (1979). Nevertheless, in 1990 Meyer, Allen, and Smith excluded the orientation-turnover questions and instead added affective commitment and continuance commitment scales. To increase the range, in

1993, Meyer, Allen, and Smith again revised the previous version of their scales and added a normative commitment scale, thus shaping the final version of three-component conceptualization of organizational commitment scale, which also contains a few reverse questions among three individual scales. For instance, question numbers 4, 6, and 8 of affective organizational commitment, question numbers 1 and 4 of the continuance organizational commitment scale, and question numbers 2, 3, 7, and 8 of the normative organizational commitment are reverse questions. Typically, the integration of measurement and the three-component conceptualization of organizational commitment scale is in a 7- point Likert-type format (1 = strongly disagree, 2 = disagree, 3= slight disagree, 4 = neutral, 5 = slight agree, 6= agree, and 7= strongly agree). For the current study, the 7- point of Likert-type format was still utilized. In addition, each element of organizational commitment consisted of 8 questions, so the total number of questions in organizational comment section was 24.

Teamwork

Teamwork is a well-discussed topic in quite a few disciplines. However, finding an instrument that aims to investigate the successful elements of teamwork was no easy task because many instruments have primarily covered the vague concepts of teamwork.

Based on an interpretation of the topic for this study, Parker's (1997) team success survey was the most appropriate instrument for investigating the concepts: team structure, organizational support, and internal process of teamwork because part of this study's interest was to acquire the variables of operational effectiveness of teamwork in electronics and non-electronics companies taken from Taiwan's stock market. Parker's (1997) team success survey comprised three main elements among a total of 30 questions

in a 7- point of Likert-type format. The 30 questions were evenly categorized into three areas: team structure, organizational support, and internal processes.

Validity

"The validity of a measurement instrument is the extent to which the instrument measures what it is actually intended to measure" (Ormrod & Leedy, 2005, p. 92). However, the overall picture of validity exists in various forms which require different criteria: face validity, content validity, criterion validity, and construct validity (Ormrod & Leedy, 2005). The validity option for this study is content validity based on two reasons:

First, the two instruments utilized were developed 15 to 20 years ago. Some wording may need slight revision in order to conform to today's rhetoric.

Second, the survey target for this study focused on the listed companies in electronics and non-electronics companies on Taiwan's stock market instead of just a single company. Therefore, the content of the instrument should be able to generally cover the characteristics of different industrial categories.

The actual implementation of content validity for this study was based on the reviews and suggestions from panel experts who clarified the instrument's wording, format, and content. The experts involved in this process were: Dr. Edgar I. Farmer, Dr. Judith A. Kolb, Dr. Richard A. Walter, and Dr. Edgar P. Yoder. All of the panel are faculty members in the graduate school at The Pennsylvania State University and are knowledgeable and reputed scholars in workforce studies and research methods.

Plus, the original language of three-component conceptualization of organizational commitment scale (Meyer et al., 1993) and the team success survey (Parker, 1997) were

written in English. In order to have the accurate translation and content in Chinese, Dr. Jia-Mi Chen, professor of education at National Taitung University in Taiwan, alumnus of Workforce Education and development at The Pennsylvania State University, was the person to check the researcher's translation.

Reliability

"The reliability of a measurement instrument is the extent to which it yields consistent results when the characteristic being measured has not changed" (Ormrod & Leedy, 2005, p. 93). In other words, reliability is the tool to measure accuracy and precision with two aspects of the instrument: stability and equivalence/consistency.

The option of reliability for this study was Cronbach's α which considered the degree of conceptual reliability of teamwork and organizational commitment. The main reason for this option was statistical consideration. Since the instrument format for two dependent variables was a 7-point Likert-type scale, Cronbach's α is the most proper and powerful statistical technique. In addition, according to Stephen Isaac and William Michael's (1995) proposition, the value of Cronbach's α, greater than 0.7, is considered to represent high reliability; values between 0.3 to 0.7 are moderate reliability, and less than 0.3 is low reliability.

Data Collection

The data collection for this study comprised several sequential stages:

Constructing questionnaire: Two instruments, three-component conceptualization of organizational commitment scale (Meyer et al., 1993) and team success survey (Parker, 1997), were components of the first two parts of the questionnaire. An integration of items of organizations' characteristics was the third part of questionnaire. These items

were: total number of employees, years of establishment, industrial category, location, capital, earnings per share, rate of employee profit sharing, various aspects of training, various types of compensation and benefits, ratio of tenured employees, ratio of gender, ratio of employees' educational levels, and employee turnover rate.

Human subject protection: The next step was to obtain approval for human subject protection at The Pennsylvania State University. Since this study did not expose any minimal risk, the level of research protection was exemption review. In addition, in order to protect participants' rights and confidentiality, a consent form was distributed and filed.

The researcher obtained research permission from the Office of Research Protections (ORP) at The Pennsylvania State University on Friday, October 10th, 2008 and the document number was 29558.

Pilot testing: The purpose of pilot testing was to have additional comments and feedback from participants in order to correct or revise survey instruments for a wider population before the instrument was officially distributed. Generally speaking, the recommended number for pilot testing ranges from ten to thirty (Issacson & Michael, 1997). Thus, for this study, a randomly selected list of 30 companies from among the overall target population was the pilot testing sample.

The researcher conducted the pilot testing on Friday, October 17th, 2009. As Table 3-4 shown, the overall Cronbach's α reliability of combined questionnaire, three-component conceptualization of organizational commitment scale (Meyer et al., 1993) and team success survey (Parker, 1997) was .924. In addition to individual dependent variable and its sub-component, the value of Cronbach's α reliability

were: .542 for organizational commitment, .477 for effective commitment, .496 for continuance commitment, .366 for normative commitment, .944 for team work, .909 for team structure, .887 for organizational support, and .844 for internal process.

Although the Cronbach's α reliability of integral questionnaire for pilot testing was .924 higher than .7, each dependent variable, teamwork and organizational commitment, had different degree of Cronbach's α reliability. For instance, Cronbach's α reliability in teamwork and its sub-component was higher than that in organizational commitment and its sub-component. Even though the Cronbach's α reliability of organizational commitment was not higher than .7, the value was still considered a moderate reliability (Isaac & Michael, 1995). As a result, the researcher decided not to modify the original version of three-component conceptualization of organizational commitment scale which Meyer, Allen, & Smith (1993) proposed. Hence, both original versions of three-component conceptualization of organizational commitment scale (Meyer et al., 1993) and team success survey (Parker, 1997) were utilized for survey in this study.

Table 3-4

Reliability for Teamwork and Organizational Commitment from Pilot Testing

Measure	Number of items	Cronbach's Alpha
Overall questionnaire	54	.924
Organizational commitment	24	.542
Effective commitment	8	.477
Continuance commitment	8	.496
Normative commitment	8	.366
Teamwork	30	.944
Team structure	10	.909
Organizational support	10	.887
Internal process	10	.844

Distributing questionnaire: Distribution of 234 questionnaire packages occurred at the end of October, 2008. The package included a cover letter, questionnaire, consent form, and a postage pre-paid envelope.

Follow-up reminder: A post card, as the reminder, was mailed in the middle of November, 2008 in order to increase the overall return-rate of survey.

Data storage and research closure: The completion of data collection process occurred at the end of November, 2008, along with a filing of human subject protection documents to close this research project. Finally, based on the regulations of human subject protection, the research data must be stored safely for at least 3 years; therefore, storing and archiving the consent forms and the returned questionnaires were practiced according to regulations.

Data Analysis

Data analysis is the step in which numerical data are mathematically manipulated and statistically analyzed, and then the results are interpreted with respect to the original research questions (Ormrod & Leedy, 2005). Thus, the following sections present the conceptual model which the researcher proposed for the third research question, the approaches for coding the numerical responses in SPSS 16.0 and Amos 7.0 statistical software, and determination of the statistical techniques employed to analyze the data.

Coding Data

Based on the characteristics of dependent variables, the instruments of teamwork and organizational commitment were both in 7- point of Likert-type format (strongly disagree = 1, disagree = 2, slight disagree = 3, neutral = 4, slight agree = 5, agree = 6, and strongly agree = 7), allowing coding the dependent variables from 1 to 7 according to the each participant's response.

In terms of the coding of independent variables, which were of nominal and interval/ratio types, some variables applied for direct recording of the original numbers, but other variables had to combine or revert of the original numbers in a certain way. The details of coding in each independent variable were:

1. Total number of employees: direct coding of the original numbers.
2. Years of establishment: direct coding of the original numbers.
3. Industrial category: electronics companies = 1, non-electronics companies = 0.
4. Location: Northern = 1, Middle = 2, Southern = 3.

5. Gender ratio: The first step was coding male as 1 and female as 2. The second step was to have the male coding divided by female coding to obtain the gender ratio.
6. Educational levels (high/low): The first step was coding high school as 1, college degree as 2, master degree as 3, and Ph.D as 4. The following step was to combine high school and college degree and code them as 0 whereas master and Ph. D. as 1. Then, the 0 number was divided by the 1 number to obtain the educational level ratio.
7. Ratio of employee tenure: direct coding of the original numbers.
8. Employee turnover rate: direct coding of the original numbers.
9. Various aspects of training: The various aspects of training comprised three aspects: cognitive training (knowledge learning), psychomotor training (physical skills), and affective training (attitudes, values, and interests). However, the effectiveness or efficiency of various aspects of training was not the primary focus for this study, so the researcher only counted the frequency of various aspects of training from each survey participant instead of further complex coding.
10. Various types of compensation and benefits: In this study, various types of compensation and benefits contained six main categories with a total of 46 check-points. The six categories classified various types of compensation and benefits as individual, group, family, bonus, working hour, and facility (see the Appendix A). However, the main focus of this study was to explore the interaction between overall organizations' characteristics and teamwork and

organizational commitment. Hence, similar to coding various aspects of training, the researcher only counted the frequency of various types of compensation and benefits from each survey participant instead of further complex coding.

11. Capital (billion): direct coding of the original numbers.
12. Earnings per share: direct coding of the original numbers.
13. Employee profit sharing: direct coding of the original numbers.

Conceptual Model

The conceptual model depicted in Figure 4-1 illustrated the overall conceptual model which the researcher proposed for this study. The variables shown in the three goals are latent variables for the conceptual model of this study: organizations' characteristics, organizational commitment, and teamwork. The ten rectangles located on both sides are observed variables: effective commitment, continuance commitment, normative commitment, team structure, organizational support, internal process, years of establishment, ratio of employee tenure, employee turnover rate, and training. Normally, latent variables are regarded as a construct which is a mental image, a concept or an idea, also called an exogenous variable. Comparatively, observed variables are considered concepts which pertain to specific objectives, events, conditions or series of meanings or characteristics, also called an endogenous variable.

Previous step of data analysis in research question 1 and 2, the researcher integrated all thirteen independent variables into simultaneous multiple regression and stepwise multiple regression analyses. Nevertheless, the results only indicated four independent variables, years of establishment, ratio of employee tenure, employee turnover rate, and

training, were statistically significant with organizational commitment and teamwork respectively in electronics and non-electronics industrial companies on Taiwan's stock market. As a result, in analysis of structural equation modeling (SEM) for research question 3, the researcher excluded the other nine organizations' variables and only integrated four organizations' characteristics into analysis of SEM.

The parameter estimation of SEM for this study only used the Maximum Likelihood Method (MLM). The researcher used various procedures before the conceptual model for electronics and non-electronics companies respectively (see Figure 4-1 and Figure 4-2) was drawn. These examination of procedures sequentially consisted of:

1. Assessment of normality (Kline, 2004);

   The value of critical ratio in multivariate analysis should be less than 1.96.

2. Offending estimates check (Hair, Anderson, Tatham, & Black, 1995);

   a. It is not tolerant to have negative estimates of standard error.

   b. Estimate of standardized regression cannot be over or close to 1.

3. Construct reliability (Fornell & Bookstein, 1982);

   If the value of construct reliability is greater than .6, it indicates the model possess good reliability.

4. Goodness-of-fit (Jaccard & Wan, 1996; Kline, 2004).

   Goodness-of-fit is to determine if the pattern of variances and covariances in the data is consistent with a conceptual model specified by the researcher.

   a. $\chi^2 \rightarrow p > .05$

   b. Goodness of fit index (GFI) $\rightarrow > 0.9$

   c. Root mean square residual (RMR) $\rightarrow < 0.05$

d. Root mean square error of approximation (RMSEA) → < 0.1

e. Adjust goodness of fit index (AGFI) → > 0.9

f. Normed fit index (NFI) → Close to 1

g. Comparative fit index (CFI) → Close to 1

h. Incremental fit index (IFI) → Close to 1

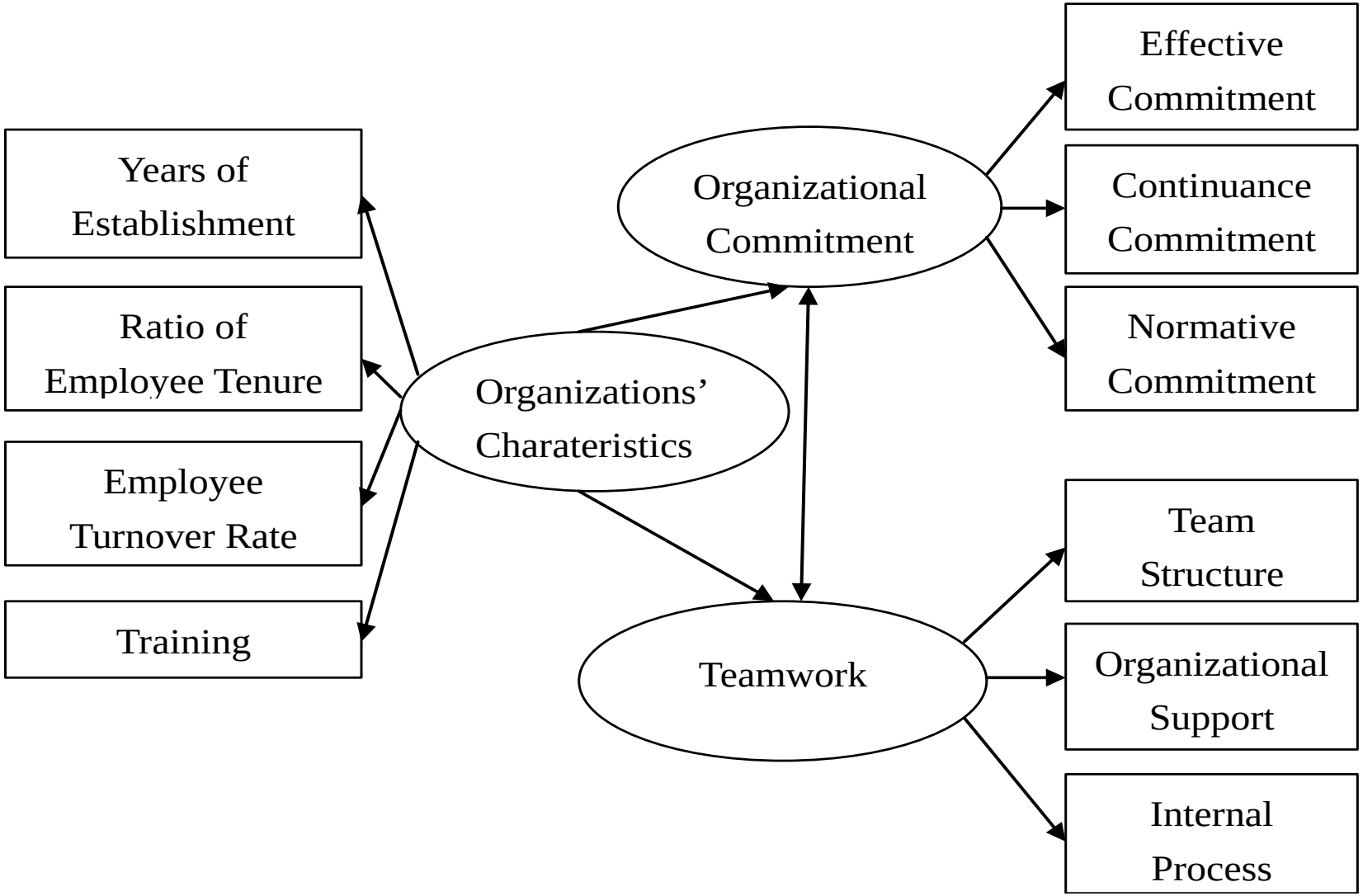

Figure 3-1. The conceptual model with paths and factors among the constructs.

Analytic Approaches

Next, an essential operation generated the descriptive statistics to profile the characteristics of the sample. Table 3-5 present the proper approaches for the analysis of descriptive statistics based on the characteristics of specific scales of measurement and variables in each research question, such as mean, median, frequency, standard deviation, Skewness, and Kurtosis. In addition, in this stage two frequently important aspects need to be checked to avoid misconstrued analysis (Ormrod & Leedy, 2005):

1. Whether a large proportion of missing data exists or too few cases appear for certain variables.
2. Whether or not an extremely large or small numbers of outliers for certain variables are present.

In terms of the inferential statistical analysis for this study, since three scales of measurement were used in the questionnaire, in statistics (nominal, ordinal, and interval/ratio), different analytical methods were necessary to meet the assumptions of the characteristics of both independent and dependent variables (see Table 3-5). Specifically, the variables of the first two research questions involved ordinal, nominal and internal/ratio measurements; therefore, the proper techniques for its inferential analysis were Pearson's product-moment correlation, simultaneous multiple regression, and stepwise multiple regression. The third research question still similarly encompassed ordinal, nominal and internal/ratio measurements. However, the third research question involved and predicted more complex association between both dependent variables and independent variables. Thus, SEM was the most powerful and advanced statistical approach to satisfy the need of the third research question.

Table 3-4

Mapping of Analysis Plan

Research question	Type and scale of variable		Analytical procedure	
	Independent variable	Dependent variable	Descriptive approach	Inferential approach
What is the relationship between the organizations' characteristics and teamwork in electronics and non-electronics industrial companies in Taiwan?	Nominal Interval/Ratio	Ordinal	Mean, Median, SD, Frequency Skewness, Kurtosis	Pearson's product-moment correlation, Simultaneous multiple regression, Stepwise multiple regression
What is the relationship between the organizations' characteristics and organizational commitment in electronics and non-electronics industrial companies in Taiwan?	Nominal Interval/Ratio	Ordinal	Mean, Median, SD, Frequency Skewness, Kurtosis	Pearson's product-moment correlation, Simultaneous multiple regression, Stepwise multiple regression
To what extent is the relationship between teamwork and organizational commitment among electronics and non-electronics industrial companies in Taiwan modified by organizations' characteristics?	Interval/Ratio	Ordinal	Skewness, Kurtosis	Structural Equation Modeling

Chapter Summary

The main purpose of this study was to determine the existence of an association between organizations' characteristics in electronics companies and non-electronics companies on Taiwan's stock market and two organizational interventions: teamwork and organizational commitment. In order to acquire the necessary research data, the combined instruments of Meyer, Allen, and Smith's (1993) three-component conceptualization of organizational commitment and Parker's (1997) team success survey were intended for 234 listed companies in Taiwan as the study's sample. In addition, content validity and Cronbach's α were the techniques to ensure validity and reliability for this study. Finally, with regards to data analysis, both descriptive and inferential statistics were analyzed: mean, median, frequency, standard deviation, Skewness, Kurtosis, Pearson's product-moment correlation, simultaneous multiple regression, stepwise multiple regression, and structural equation modeling.

CHAPTER 4

DATA ANALYSIS AND RESULTS

This chapter reports the statistical findings and results from the field research of this study, and this chapter is divided into four sections with respective sub-sections. To begin with, the purpose of this study and research questions were addressed again, followed by statistical methodology, data profile of demographics, normality, and Cronbach's alpha reliability. Furthermore, the assessment of findings and results were explained and connected to the relevant research questions, structured into three themes emerging from each research question.

Review of the Study

The purpose of the study was to determine the presence of an association between organizations' characteristics in listed companies on Taiwan's stock market and two organizational interventions: teamwork and organizational commitment. In addition to contributing to the field of human resource development, the unique aspect of this study was that it also offered an alternative perspective to the interaction between teamwork and organizational commitment in listed companies on Taiwan's stock market.

Originally, the researcher aimed to determine the exact relationship between different industrial companies on Taiwan's stock market and then conclude an integral structure regarding the variables which the researcher investigated. However, due to the limited quantity and lower return rate from certain categories of the industrial companies, the researcher revised this presumed analytic approach and instead chose to combine some industrial companies from different categories. Hence, the total number of

companies was divided into two general industrial categories, electronics vs. non-electronics, based on current industrial characteristics and development in Taiwan.

The following research questions were designed to obtain necessary information in order to guide the acquisition of data to satisfy the requirements of the statement of the main problem and the purpose of the study:

1. What is the relationship between the organizations' characteristics and teamwork in electronics and non-electronics industrial companies in Taiwan?
2. What is the relationship between the organizations' characteristics and organizational commitment in electronics and non-electronics industrial companies in Taiwan?
3. To what extent is the relationship between teamwork and organizational commitment among electronics and non-electronics industrial companies in Taiwan modified by organizations' characteristics?

In terms of methodological approaches, this study utilized both descriptive and inferential statistics. The most advanced inferential statistical technique was Structural Equation Modeling (SEM), simultaneous multiple regression, and stepwise multiple regression. In addition, in order to acquire the comprehensive picture of data, basic descriptive statistics, such as mean, standard deviation, frequency, skewness, kurtosis, and Pearson's Product-Moment Correlation were considered simultaneously. Based on these statistical concepts, SPSS 16.0 and Amos 7.0 were utilized for data analysis. The results and findings specific to each research follow.

Data Profile

Rate of Return

Based on the size of sample proposed in Chapter 3, the estimated sample size was 234, given a 95% confidence level of the target population of 584 listed companies on Taiwan's stock market. However, after the one-month period of data collection, the 131 completed surveys represented a 55.98% return rate. The 131 companies represented 23.91% of the target population. As shown in Table 4-1, among 131 returned surveys, 54 (41.22%) were from electronics companies and 77 (58.78%) from non-electronics companies.

Normality Assumption

To access whether the distribution for organizations' characteristics within both the electronics and non-electronics sample deviated from a normal distribution, skewness and kurtosis values were examined. Basically, the eleven independent variables represented interval/ration type of measurement, and the skewness values ranged from -1.89 to 2.88 and the kurtosis value ranged from -1.13 to 9.79 (see Table 4-1 and 4-2). Consequently, both of skewness and kurtosis values indicated an approximately normal distribution (Field, 2005).

Demographics

The demographics of electronics and non-electronics companies were different in some ways, but most of companies surveyed were located in northern Taiwan (see Table 4-1 and 4-2). The total number of employees in non-electronics companies (*M* = 1725, *Median* = 605, *SD* = 2777) was over twice larger than that in electronics companies on Taiwan's stock market (*M* = 621.5, *Median* = 400, *SD* = 558.2). The gender ratio, male

divided by female, in non-electronics companies (*M* = 2.75, *SD* = 2.98) was higher than that in electronics companies (*M* = 1.23, *SD* = .86). In other words, non-electronics companies had proportionately more male employees compared to electronics companies. In addition, the proportion employee tenure ratio (tenure / non tenure) in non-electronics companies (*M* = 69.7%, *SD* = 22.54%) was greater than that in electronics companies (*M* = 57.42%, *SD* = .15.47%). However, the value of annual employee turnover rate in electronics companies (*M* = 11.51%, *SD* = 8.76%) was higher than that in non-electronics companies (*M* = 5.87%, *SD* = 5.01%). The results above indicated that the higher ratio of employee tenure contributed to lower employee turnover rate. In terms of the capital presented on Taiwan's stock market, non-electronic companies (*M* = 35.57, *Median* = 23.67, *SD* = 35.39) possessed higher capital in billions than electronics companies (*M* = 23.42, *Median* = 14.87, *SD* = 21.38).

On the other hand, due to the industrial characteristics and development, employees in electronics companies (*M* = .169, *SD* = .123) reported higher educational background than those in non-electronics companies (*M* = .095, *SD* = .089). As a result, the various types of compensation and benefits in electronic companies (*M* = 17.67, *SD* = 6.5) were better than those in non-electronic companies (*M* = 15.43, *SD* = 6.04). In addition, regarding the various aspects of training, the differences between both electronics and non-electronics companies were not obvious.

The electronics companies basically displayed more value than non-electronics companies on Taiwan's stock market. For instance, earnings per share (*M* = 3.03%, *Median* = 2.55%, *SD* = 3.25%) and employee profit sharing (*M* = 6.56%, *Median* = 5%, *SD* = 6.11%) in electronics companies were higher than those in non-electronics

companies (earnings per share: *M* = 1.71%, *Median* = 1.25%, *SD* = 1.9%, employee profit sharing: *M* = 4.13%, *Median* = 3.1%, *SD* = 3.27%).

Table 4-1

Distribution of Organizations' Characteristics for Electronics Companies (*n* =54)

Variables	*M*	*SD*	*f*	*Skewness*	*Kurtosis*
Total number of employees	621.5	558.2		1.65	1.73
Years of establishment	76.4	11.3		-1.89	7.28
Location					
Northern			44		
Middle			4		
Southern			6		
Gender ratio (male/female)	1.23	.86		.95	.74
Educational levels (high/low)	.16	.12		.56	-.58
Ratio of employee tenure (%)	57.42	15.47		-.27	.10
Employee turnover rate (%)	11.51	8.76		1.44	2.15
Various aspects of training	2.20	.83		-.81	.01
Various types of compensation and benefits	17.67	6.50		.41	.08
Capital (billion)	23.42	21.38		1.85	3.41
Earnings per share (%)	3.03	3.25		1.06	1.99
Employee profit sharing (%)	6.56	6.11		1.54	3.22

Table 4-2

Distribution of Organizations' Characteristics for Non-Electronics Companies (*n* =77)

Variables	*M*	*SD*	*f*	*Skewness*	*Kurtosis*
Total number of employees	1725	2777		2.88	9.79
Years of establishment	61.57	18.28		.08	3.83
Location					
Northern			47		
Middle			13		
Southern			17		
Gender ratio (male/female)	2.75	2.98		1.56	2.13
Educational levels (high/low)	.09	.08		1.54	2.44
Ratio of employee tenure (%)	69.70	22.54		-1.47	1.76
Employee turnover rate (%)	5.87	5.01		1.50	2.80
Various aspects of training	2.21	.74		-.36	-1.13
Various types of compensation and benefits	15.43	6.04		.92	1.22
Capital (billion)	35.57	35.93		1.96	3.86
Earnings per share (%)	1.71	1.90		1.29	1.95
Employee profit sharing (%)	4.13	3.27		.77	-.01

Reliability

Two scales developed respectively by Meyer, Allen, and Smith (1993) and Parker (1997) were used to measure organizational commitment and teamwork within electronics and non-electronics companies on Taiwan's stock market. As reported in chapter 3, Cronbach's alpha was the statistical technique used to determine reliability.

The original Cronbach's alpha values ranged from .175 to .954 (see Table 4-3). Although the entire 54 item scale Cronbach's alpha was higher than .7 (Cronbach's alpha = .916), Cronbach's alpha of organizational commitment and its sub-components was

lower than .7: .643 for organizational commitment, .465 for effective commitment, .525 for continuance commitment, and .175 for normative commitment. Isaac & Michael (1995) indicate .7 or higher is acceptable.

Regarding the lower Cronbach's alpha of organizational commitment and its sub-components, the researcher used item analysis to identify items to resume to possibly increase reliability. Subsequently, overall Cronbach's alpha increased to .943 with 46 questions including organizational commitment and teamwork: .802 for organizational commitment, .699 for effective commitment, .732 for continuance commitment, and .597 for normative commitment. Items deleted for final analysis follow.

1. Effective commitment:

   #8: I do not feel a strong sense of belonging to my organization (R).

2. Continuance commitment:

   #2: It would be very hard for me to leave my organization right now, even if I wanted to.

   #4: It would not be too costly for me to leave my organization now (R).

3. Normative commitment:

   #1: I think that people these days move from company to company too often.

   #2: I do not believe that a person must always be loyal to his or her organization (R).

   #3: Jumping from organization to organization does not seem at all unethical to me (R).

   #7: Things were better in the days when people stayed with one organization for most of their career (R).

#8: I do not think that wanting to be a company man or company woman is sensible anymore (R).

Table 4-3

Reliability for Teamwork and Organizational Commitment

		Original		Adjusted
Measure	# items	Cronbach's Alpha	# items	Cronbach's Alpha
Overall questionnaire	54	.916	46	.943
Organizational commitment	24	.643	16	.802
Effective commitment	8	.465	7	.699
Continuance commitment	8	.525	6	.732
Normative commitment	8	.175	3	.597
Teamwork	30	.954	30	.954
Team structure	10	.872	10	.872
Organizational support	10	.904	10	.904
Internal process	10	.909	10	.909

Note. In order to increase the reliability of the first section, organizational commitment, item number 8 of effective commitment, item number 2 and 4 of continuance commitment, and item number 1, 2, 3, 7, and 8 of normative commitment were exclusive from this analysis.

Factor Influencing Teamwork

Tables 4-4, 4-5 and 4-6 summarize the necessary information in order to answer research question 1: What is the relationship between organizations' characteristics and teamwork in electronics and non-electronics industrial companies in Taiwan?

Pearson's Product-Moment Correlation

To assess the statistical significance, the researcher chose Pearson's product-moment correlation as the first step. These correlations are presented in Table 4-4 where it can be

seen that only four correlations were statistically significant ($p < .05$ or $p < .01$, two-tailed).

Statistically speaking, the most significant result between organizations' characteristics and teamwork in non-electronics industrial companies on Taiwan's stock market was employee turnover rate at $r = -.348$, $p < .01$. In addition, the two sub-components of teamwork, team structure and internal process, were statistically significant respectively at $r = -.379$ and $r = -.393$, $p < .01$. These negative correlations indicated that higher employee turnover rate resulted in lower values of teamwork and its sub-components (team structure and internal process) in non-electronics industrial companies. Although the organizations' characteristics and teamwork in electronics industrial companies did not show the statistical significance, the correlations still reflected the same negative direction.

Various types of training also positively influenced the performance of teamwork and its sub-components, particularly in organizational support and internal process. For example, in non-electronics industrial companies, more various types of training positively enhanced the level of teamwork and organizational support ($r = .274$ and .306, $p < .05$). Similarly, higher performance of internal process in electronics companies was influenced by more various types of training ($r = .353$ and .306, $p < .05$).

Finally, other correlations may not be statistically significant, but it still provided certain trends to distinguishing differences between electronics and non-electronics companies. Speaking of which, companies with more male employees, higher employee educational background, higher earnings per share, and higher employee profit sharing could be a factor to higher levels of teamwork. On the contrary, organizations'

characteristics, such as total number of employees, year of establishment, ratio of employee tenure, and capital, had very little influence in teamwork in electronics and non-electronics companies.

Table 4-4

Correlations between Organizations' Characteristics and Teamwork

Subscale	TW	TS	OS	IP
		Electronics (*n*=54)		
Total number of employees	.002	-.012	-.076	.096
Years of establishment	.156	.086	.064	.269
Location	.117	.030	.187	.094
Gender ratio	.215	.194	.192	.193
Educational levels	.034	.103	.021	-.030
Ratio of employee tenure	-.162	-.123	-.200	-.111
Employee turnover rate	-.092	-.006	-.254	.019
Training	.263	.101	.252	.353*
Compensation and benefits	.155	-.017	.265	.163
Capital	.068	.095	-.013	.103
Earnings per share	.032	.048	.081	-.043
Employee profit sharing	.170	.165	.178	.114
		Non-Electronics (*n*=77)		
Total number of employees	-.065	-.029	-.080	-.068
Years of establishment	-.135	-.072	-.209	-.068
Location	.159	.180	.159	.102
Gender ratio	.143	.094	.150	.153
Educational levels	.061	.044	.067	.057
Ratio of employee tenure	-.015	-.047	-.032	.045
Employee turnover rate	-.348*	-.379**	-.236	-.393**
Training	.274*	.243	.306*	.203
Compensation and benefits	.061	.098	.042	.034
Capital	-.121	-.205	-.132	-.085
Earnings per share	.154	.240	.099	.103
Employee profit sharing	.126	.125	.119	.110

Note. TW = teamwork; TS = team structure; OS = organizational support; IP = internal process.
*$p < .05$. **$p < .01$.
Exclusive of all missing data.

Multiple Regression

"Whereas correlation concentrates on the relationship that exists between variables, regression focuses on the variables that exist on one or the other ends of the link … regression will be trying to accomplish one or the other of two goals. These two goals involve prediction on the one hand and explanation on the other " (Huck, 2008, pp. 406-407). In a sense, multiple regression gradually gained increasing attention because it can involve a single dependent variable but more than two independent variables. In this study, two types of multiple regression were applied, simultaneous multiple regression and stepwise multiple regression. Generally speaking, simultaneous regression involves cases in which the investigator enters all of the predictors into the analysis at once. Stepwise regression involves choosing which predictors to analyze on the basis of statistics. As shown frequently in many studies, both simultaneous regression and stepwise regression are typically used to explore and maximize prediction (Petrocelli, 2003).

In the initial-phase of regression analysis, simultaneous multiple regression, the predictor variables were the fourteen organizations' characteristics – industrial category (X_1), total number of employees (X_2), years of establishment (X_3), location of north vs south (X_4), location of middle vs south (X_5), gender (X_6), educational level (X_7), ratio of employee tenures (X_8), employee turnover rates (X_9), training (X_{10}), compensation and benefits (X_{11}), capital (X_{12}), earning per share (X_{13}), employee profit sharing (X_{14}); and the repose variables was teamwork (Y'). The regression analysis generated a set of coefficients that were used to formulate the regression equation below (see Table 4-5):

$$Y' = 154.31 - 2.65X_1 - .09X_3 - 8.1X_4 + .53X_5 + .95X_6 + 7.15X_7 - .11X_8 - .61X_9 + 8.01X_{10} + .12X_{11} + .01X_{12} - .13X_{13} + .14X_{14}$$

With this equation, the sample of multiple regression results (see Table 4-5) indicated that approximately 16.9% of the variance of teamwork can be accounted for by the linear combination of these variables, which is not statistically significant at $p < .05$. Also revealed by a comparison of the standardized regression coefficients, one of the fourteen independent variables was a statistically significant predictor of intention. Training, $\beta = 2.1$, $p < .05$ emerged as the strongest predictor of teamwork. Finally, the conditional index for the entire multiple regression in teamwork was 27.688 less than 30, indicating the collinearity was moderate (Belsley, 1991; Belsley, Kuh, & Welsch, 1980).

Table 4-5

Summary of Simultaneous Fully Saturated Regression Analysis of Teamwork with Organization's Characteristics

Variables	Unstandardized coefficients					Collinearity statistics	
	B	*SE B*	β	*t*	*p*	Tolerance	VIF
(Constant)	154.31	22.68		6.80	.000		
Industrial category	-2.65	7.52	-.05	-.35	.725	.523	1.91
Total number of employees	.00	.00	-.10	-.65	.518	.384	2.61
Years of establishment	-.09	.21	-.05	-.44	.662	.707	1.42
Location							
North vs South	-8.10	7.93	-.14	-1.0	.310	.527	1.89
Middle vs South	.53	9.74	.01	.06	.956	.571	1.75
Gender ratio	.95	.61	.17	1.54	.127	.838	1.19
Educational levels	7.15	12.88	.06	.56	.580	.801	1.25
Ratio of employee tenure	-.11	.16	-.87	-.73	.468	.716	1.39
Employee turnover rate	-.61	.39	-18	-1.6	.124	.744	1.34
Training	8.01	3.69	.23	2.1	.033*	.854	1.17
Compensation and benefits	.12	.52	.03	.22	.824	.757	1.32
Capital	.01	.03	.05	.29	.774	.375	2.67
Earnings per share	-.13	1.20	-.01	-.10	.917	.799	1.25
Employee profit sharing	.14	.25	.06	.59	.560	.867	1.15

Note. R^2 = .169; ΔR^2 =.031 ($p > .05$). *$p < .05$
Dependent variable: Teamwork.
Coding for industrial category: electronics companies (1) and non-electronics companies (0).

Stepwise Multiple Regression

To identify factors affecting level of teamwork in electronics and non-electronics companies on Taiwan's stock market, stepwise multiple regression was applied with teamwork as the dependent variable to determine which variables were statistically related to teamwork. The following independent variables were thus entered: training and employee turnover rates.

As shown in Table 4-6, independent variable, training, was selected in the first step of stepwise multiple regression and explained approximately 7.1% of the variance (F (1, 97) = 7.419, p = .008). The second selected independent variable was employee turnover rate and explained an additional 4.2% of the independent variance (F (1, 96) = 4.543, p = .036). Cumulatively, training and employee turnover rates explained 11.3% of the variance and were statistically significant (F (2, 96) = 6.117, p = .003). The regression formula predicting teamwork was:

$$Y' = 139.64 - .7X_9 + 8.662X_{10}$$

Regarding standardized regression coefficients, training, β = .253, p = .01 emerged as the positive predictor of teamwork; employee turnover rates β = -.205, p = .036 emerged as the negative predictor for teamwork. Finally, the conditional index for the entire stepwise multiple regression in teamwork was 6.803, less than 30, indicating the collinearity was low (Belsley, 1991; Belsley et al., 1980).

Table 4-6

Analysis of Most Parsimonious Stepwise Regression of Teamwork with Organization's Characteristics

Model	Unstandardized coefficients				
	B	*SE B*	β	*t*	*p*
(Constant)	131.81	7.78		16.93	.000**
Model 1 (R^2 = .071; ΔR^2 =.061)					
Training	9.13	3.35	.267	2.72	.008**
(Constant)	139.16	8.38		16.59	.000***
Model 2 (R^2 = .113; ΔR^2 =.095)					
Training	8.87	3.30	.253	2.63	.010*
Employee turnover rate	-.70	.33	-.205	-2.13	.036*

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

Factor Influencing Organizational Commitment

Tables 4-7, 4-8 and 4-9 summarize the essential information in order to answer question 2: What is the relationship between organizations' characteristics and organizational commitment in electronics and non-electronics industrial companies in Taiwan?

Pearson's Product-Moment Correlation

Pearson's product-moment correlation, as inferential statistics, was the first step used to answer research question 2, and the researcher used a two tailed test with alpha established a point at $\leqq$ .05. As shown in Table 4-7, 12 correlations were statistically significant (p < .05 or p < .01, two-tailed).

In terms of electronics industrial companies, normative commitment was statistically significant and negatively related to two of organizations' characteristics, year of establishment (r = -.332, p < .05) and ratio of employee tenure (r = -.296, p < .05). These negative correlations disclosed that companies with longer history established and higher ratio of employee tenure had lower normative commitment in electronics companies on Taiwan's stock market. In addition, the larger capital in electronics companies was statistically correlated with higher continuance commitment (r = .293, p < .05).

For non-electronics companies, organizational commitment was negatively correlated with years of establishment (r = -.284, p < .05), ratio of employee tenure (r = -.363, p < .01), and capital (r = -.297, p < .05). However, location was statistically significant but positively related to location (r = .356, p < .01). Regarding sub-components of organizational comment, years of establishment (r = -.361, p < .01) was statistically significant and negatively associated with continuance commitment; location (r = .287 and .307, p < .05) were statistically significant and positively related to continuance commitment and normative commitment respectively; ratio of employee tenure (r = -.401, p < .01) was statistically significant and negatively associated with effective commitment; and capital (r = -.312, p < .05) was statistically significant and negatively associated with effective commitment.

Generally speaking, in non-electronics companies on Taiwan's stock market, companies with longer history, higher ratio of employee tenure, and larger capital had lower values for organizational commitment and its sub-components, effective commitment, continuance commitment, and normative commitment.

In sum, when compared on organizations' characteristics among electronics and non-electronics companies, there were certain similarities and differences for their effect on organizational commitment. To begin with, both electronics and non-electronics companies displayed correlation, either positive or negative, between the organizational commitment and the following characteristics: years of establishment, gender, ratio of employee tenures, training, compensation and benefits, and employee profit sharing. Nevertheless, the correlations in total number of employees, educational levels, employee turnover rates, capital, and earnings per share were not statistically significant at alpha .05 or .01 level.

Table 4-7

Correlations between Organizations' Characteristics and Organizational Commitment

Subscale	OC	EC	CC	NC
		Electronics (*n*=54)		
Total number of employees	.178	.075	.280	.004
Years of establishment	-.170	-.018	-.043	-.332*
Location	.052	-.037	-.008	.169
Gender ratio	.197	.224	.228	-.035
Educational levels	.140	-.015	.135	.181
Ratio of employee tenure	-.094	.089	-.012	-.296*
Employee turnover rate	-.234	-.273	-.133	-.121
Training	.141	.234	-.084	.208
Compensation and benefits	.151	.184	.160	-.022
Capital	.237	.150	.293*	.052
Earnings per share	-.023	.149	-.144	-.025
Employee profit sharing	-.008	-.071	.038	.005
		Non-Electronics (*n*=77)		
Total number of employees	-.045	-.098	.084	-.095
Years of establishment	-.284*	-.258	-.361**	.034
Location	.356**	.209	.287*	.307*
Gender ratio	.140	.193	-.009	.129
Educational levels	-.135	-.168	.064	-.213
Ratio of employee tenure	-.363**	-.401**	-.222	-.158
Employee turnover rate	.045	.120	-.193	.199
Training	.047	.134	.073	-.138
Compensation and benefits	.205	.198	.093	.165
Capital	-.297*	-.312*	-.249	-.068
Earnings per share	.056	.020	.038	.072
Employee profit sharing	-.008	-.071	.038	.005

Note. *Note*. OC = Organizational commitment; EC = effective commitment; CC = continuance commitment; NC = normative commitment; *$p < .05$. **$p < .01$; Exclusive of all missing data.

Multiple Regression

Simultaneous multiple regression was the second step of inferential statistics used to answer research question 2. This analysis consisted of fourteen predictor variables of organizations' characteristics – industrial category (X_1), total number of employees (X_2), years of establishment (X_3), location of north vs. south (X_4), location of middle vs. south (X_5), gender (X_6), educational level (X_7), ratio of employee tenures (X_8), employee turnover rates (X_9), training (X_{10}), compensation and benefits (X_{11}), capital (X_{12}), earning per share (X_{13}), employee profit sharing (X_{14}); and the response variables was organizational commitment (Y'). The regression analysis generated a set of coefficients that were used to formulate the regression equation below:

$$Y' = 96.91 + 4.5X_1 - .25X_3 - 5.66X_4 - 3.9X_5 + .326X_6 + 6.92X_7 - .19X_8 - 2.11X_9 + .63X_{10} + .38X_{11} - .01X_{12} - .36X_{13} - .15X_{14}$$

This simultaneous multiple regression was statistically significant, F (14, 84) = 2.687, $p < .01$, $r^2 = .309$, indicating that 30.9% of the reflection organizational commitment variance was accounted for by the variables. In addition, in aspects of standard regression coefficients of independent variables, year of establishment (β = -.289, $p < .01$) and ratio of employee tenures (β = -.294, $p < .01$) were found as having a small influence on organizational commitment. Finally, the conditional index for the entire multiple regression in organizational commitment was 27.686 less than 30, indicating the collinearity was moderate (Belsley, 1991; Belsley et al., 1980).

Table 4-8

Summary of Fully Saturated Simultaneous Regression Analysis of Organizational Commitment with Organization's Characteristics

Variables	Unstandardized coefficients					Collinearity statistics	
	B	*SE B*	β	*t*	*p*	Tolerance	VIF
(Constant)	96.91	10.02		9.67	.000		
Industrial category	4.50	3.32	.17	1.35	.179	.523	1.91
Total number of employees	.00	.00	.04	.28	.775	.384	2.61
Years of establishment	-.25	.09	-.28	-2.6	.009**	.707	1.42
Location							
North vs South	-5.66	3.50	-.20	-1.6	.110	.527	1.89
Middle vs South	-3.90	4.31	-.11	-.90	.369	.571	1.75
Gender ratio	.326	.27	.12	1.20	.233	.838	1.19
Educational levels	6.92	5.69	.12	1.21	.227	.801	1.25
Ratio of employee tenure	-.19	.07	-29	-2.7	.007**	.716	1.40
Employee turnover rate	-2.11	.17	-.13	-1.2	.228	.744	1.34
Training	.63	1.63	.31	.39	.701	.854	1.17
Compensation and benefits	.38	.23	.17	1.65	.102	.757	1.32
Capital	-.01	.10	-.17	-1.1	.266	.375	2.67
Earnings per share	-.36	.53	-.07	-.68	.497	.799	1.25
Employee profit sharing	-.15	.11	-.13	-1.4	.175	.867	1.15

Note. R^2 = .309; ΔR^2 =.194 ($p < .05$). **$p < .01$
Dependent variable: Organizational commitment.
Coding for industrial category: electronics companies (1) and non-electronics companies (0).

Stepwise Multiple Regression

Stepwise multiple regression was the third step of data analysis for research question 2. The following three independent variables were entered: year of establishment, ratio of employee tenure, and employee turnover rate.

With the first model, the contribution of year of establishment was statistically significant, F (1, 97) = 12.441, $p < .01$, $r^2 = .114$. The next selected independent variable was employee tenure cumulatively and explained approximately 4.4% of the dependent variance (F (1, 96) = 5.025, $p < .05$). The second model explained 15.8 % of the variance (F (2, 96) = 8.991, $p < .001$). The last selected independent variable was employee turnover rate, which explained significant additional variance, 3.4% (F (1, 95) = 3.983, $p < .05$). Cumulatively and statistically, year of establishment, ratio of employee tenures, and employee turnover rates explained 19.2% of the variance (F (3, 95) = 7.508, $p < .001$). The regression formula predicting teamwork was:

$$Y' = 104.031 - .288X_3 - .168X_8 - .317X_9$$

Speaking of standardized regression coefficients, year of establishment, $\beta = -.332$, $p < .01$ emerged as the most negative predictor of intention for organizational commitment; ratio of employee tenure $\beta = -.261$, $p < .01$ as the second negative predictor; employee turnover rate $\beta = -.261$, $p < .05$ as the least negative predictor for organizational commitment. Finally, the conditional index for the entire stepwise multiple regression in organizational commitment was 13.969 less than 30, indicating the collinearity was moderate (Belsley, 1991; Belsley et al., 1980).

Table 4-9

Analysis of Most Parsimonious Stepwise Regression of Organizational Commitment with Organization's Characteristics

Model	Unstandardized coefficients				
	B	*SE B*	*β*	*t*	*p*
(Constant)	90.75	5.80		15.62	.000***
Model 1 (R^2 = .114; ΔR^2 =.105)					
Years of establishment	-.293	.08	-.337	-3.52	.001**
(Constant)	100.27	7.10		14.12	.000***
Model 2 (R^2 = .158; ΔR^2 =.140)					
Years of establishment	-.30	.08	-.351	-3.74	.001***
Ratio of employee tenure	-.13	.06	-.210	-2.24	.027*
(Constant)	104.03	7.24		14.36	.000***
Model 3 (R^2 = .192; ΔR^2 =.166)					
Years of establishment	-.28	.08	-.332	-3.57	.001**
Ratio of employee tenure	-.16	.06	-.261	-2.72	.008**
Employee turnover rate	-.31	.15	-.192	-1.99	.049*

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

Factor Influencing Teamwork and Organizational Commitment Modified by Organizations' Characteristics

The following Tables and Figures summarize the analysis to answer research question 3: To what extent is the relationship between teamwork and organizational commitment among electronics and non-electronics industrial companies in Taiwan modified by organizations' characteristics?

Review of Observational Variables

The Maximum Likelihood Method was the statistical approach for SEM to determine the fit of observed variables in electronics and non-electronics companies. Kline (2004) stated if the absolute value of skewness was greater than 3 and the absolute value of kurtosis was greater than 10, that variable does not meet the condition of a multivariate normal distribution; as a result, it overestimated the value of χ^2 and underestimated parameter estimation of standard error. Therefore, the first step of SEM was to determine normality of data.

As shown in Table 4-10, among the observed variables in electronics and non-electronics companies the values of skewness ranged from -.819 to 1.456 and the values of kurtosis were between -1.237 and 2.499. Both absolute values of skewness and kurtosis were less than 3 and 10. In addition, the individual value of critical ratio in multivariate were .616 and 1.225 (less than 1.96), which meant that observed variables in electronics and non-electronics companies were normally distributed.

Table 4-10

Distribution of Organizational Commitment and Teamwork on Electronics and Non-Electronics Companies (*n* =131)

	Electronics			
Variables	*Skewness*	C.R.	*Kurtosis*	C.R.
Effective commitment	-.273	-.779	-.481	-.687
Continuance commitment	.237	.677	-1.034	-1.477
Normative commitment	-.238	-.679	.535	.764
Team structure	-.881	-2.517	2.499	3.571
Organizational support	-.305	-.871	-.318	-.454
Internal process	-.539	-1.539	-.217	-.310
Employee turnover rate	1.456	4.161	2.188	3.127
Ratio of employee tenure	-.274	-.782	.325	.465
Training	-.447	-1.278	-.994	-1.421
Years of establishment	-.205	-.587	-.840	-1.200
Multivariate			2.727	.616
	Non-Electronics			
Variables	*Skewness*	C.R.	*Kurtosis*	C.R.
Effective commitment	.168	.531	-.489	-.773
Continuance commitment	-.174	-.552	-.404	-.639
Normative commitment	-.193	-.610	-.426	-.674
Team structure	-.529	-1.674	.045	.071
Organizational support	-.478	-1.513	-.166	-.262
Internal process	-.283	-.895	-.575	-.910
Employee turnover rate	.552	-1.746	-.151	-.239
Ratio of employee tenure	-.819	-2.590	.773	1.222
Training	-.359	-1.135	-1.237	-1.956
Years of establishment	-.771	-2.437	1.521	2.405
Multivariate			4.899	1.225

Note. C.R.: Critical ratio.

The correlations between most of observed and latent variables were statistically significant at alpha .05 or .01 level (see Table 4-11), except for a few correlations. For instance, in electronics companies, the two correlations, effective commitment between normative commitment and normative commitment between internal process, were not statistically significant. Correspondingly, in non-electronics companies two correlations were not statistically significant: continuance commitment between internal process and normative commitment between internal process.

Furthermore, in the electronic industrial companies teamwork had the strongest relation along with organizational support (r =.91) and internal process (r =.91). The second strongest relation was between teamwork and team structure (r =.86). Equally, in the non-electronics industrial companies, teamwork also predicted the strongest relationship with its three sub-components: organizational support (r =.94), team structure (r =.92), and internal process (r =.92).

Table 4-11

Intercorrelations between Organizational Commitment and Teamwork

Measures	1	2	3	4	5	6	7	8
				Electronics (*n*=54)				
1. OC	1.00	.81**	.85**	.58**	.58**	.54**	.54**	.48**
2. EC		1.00	.50**	.26	.46**	.38**	.42**	.44**
3. CC			1.00	.30*	.51**	.53**	.43**	.40**
4. NC				1.00	.34*	.27*	.41**	.21
5. TW					1.00	.86**	.91**	.91**
6. TS						1.00	.65**	.66**
7. OS							1.00	.76**
8. IP								1.00
				Non-Electronics (*n*=77)				
1. OC	1.00	.84**	.83**	.55**	.48**	.49**	.53**	.30**
2. EC		1.00	.51**	.26*	.41**	.42**	.44**	.26*
3. CC			1.00	.25*	.37**	.38**	.40**	.22
4. NC				1.00	.32**	.29**	.37**	.20
5. TW					1.00	.92**	.94**	.92**
6. TS						1.00	.80**	.78**
7. OS							1.00	.78**
8. IP								1.00

Note. OC = Organizational commitment; EC = effective commitment; CC = continuance commitment; NC = normative commitment; TW = teamwork; TS = team structure; OS = organizational support; IP = internal process.
*p < .05. **p < .01.

Structural Equation Modeling – Electronics Companies

The next step of SEM was offending estimates check. The purpose of offending estimates check was to ensure the conceptual model of this study which the researcher proposed was not against statistical estimation of SEM.

As shown in Table 4-12, all estimates of standard error were positive, ranging from .05 to .83 and estimate standardized regression coefficients were between -.01 and .87, which were less than 1. Both indications above corresponded with Hair, Anderson, Tatham, and Black's statistical assumptions (1995). It is not acceptable to have negative estimates of standard error and the estimated standardized regression coefficient cannot be over or close to 1. Consequently, the conceptual model in electronics companies for offending estimates check was quite satisfactory.

Table 4-12

Parameter Estimation of Conceptual Model for the Latent Variables to Observed Variables for Electronics Companies

Estimate	Unstandardized Estimate	S.E.	C.R.	P	Standardized Estimate
Effective commitment	1.00				.60
Continuance commitment	1.31	.42	3.12	.002	.64
Normative commitment	.79	.32	2.54	.011	.48
Team structure	1.00				.78
Organizational support	1.34	.23	5.91	***	.87
Internal process	1.04	.19	5.54	***	.79
Employee turnover rate	1.00				.33
Ratio of employee tenure	-.03	.83	-.04	.971	-.01
Training	-.05	.05	-1.03	.304	-.18
Years of establishment	.26	.50	.53	.597	.09

Note. S.E.: Approximate standard error. C.R.: Critical ratio; ***P < .001

One of the evaluation criteria of SEM is construct reliability. If the value of construct reliability is greater than .6, it indicated the inherent conceptual model was good (Fornell & Bookstein, 1982). The formula of construct reliability presented as follows:

$$\rho_c = \frac{\sum(\lambda)^2}{[\sum(\lambda)^2 + \sum(\theta)]}$$

ρ_c = construct reliability

λ = standardized estimate of latent variables for indicator variable

θ = error variance of observed variable

In addition, another similar option to assess reliability is average variance extracted. Basically, higher average variance extracted predicts a higher level of latent variables for indicator variables. Normally, if average variance extracted value is higher than 0.5, then it had higher distinct validity (Fornell & Larcker, 1981). The equation of average variance extracted is shown below:

$$\rho_v = \frac{\sum(\lambda^2)}{[\sum(\lambda^2) + \sum(\theta)]}$$

ρ_v = average variance extracted

λ = standardized estimate of latent variables for indicator variable

θ = error variance of observed variable

Obviously, in electronics companies the individual reliabilities of observed variables, sub-components of teamwork, were higher than sub-components of organizational commitment (see Table 4-13). The strongest reliability was organizational support with .76 and the lowest reliability was normative commitment with .23.

Speaking of construct reliability, both latent variables in electronics companies, organizational commitment (ρ_c = .041) and teamwork (ρ_c = .087), were less than .6. Additionally, values of average variance extracted were less than .5: organizational commitment (ρ_v = .014) and teamwork (ρ_v = .031). These results suggested that the reliability of the conceptual model in electronics companies was not ideal.

Table 4-13

Individual Reliability of Observed Variables and Construct Reliability of Latent Variables with Average Variance Extracted for Electronics Companies

Variable	Individual reliability	Construct reliability	AVE
Organizational commitment		.041	.014
Effective commitment	.37		
Continuance commitment	.41		
Normative commitment	.23		
Teamwork		.087	.031
Team structure	.61		
Organizational support	.76		
Internal process	.63		

Note. AVE: average variance extracted.

SEM was the inferential statistical technique to be used to explore the relationships among observed and latent variables for the conceptual model. In this study, the researcher depicted the relationship among constructs in conceptual model which the researcher proposed: organizational commitment, teamwork, and organizations' characteristics.

In order to evaluate the overall fit of data and conceptual model proposed, several indices should be reported and considered: Chi-square, Goodness of fit index (GFI), Root

mean square residual (RMR), Root mean square error of approximation (RMSEA), Adjusted goodness of fit index (AGFI), Normed fit index (NFI), Comparative fit index (CFI), and Incremental fit index (Jaccard & Wan, 1996; Kline, 2004). The indications of goodness-of-fit are shown in Table 4-14.

The details of model fit measures for electronics companies present in Table 20. Five of 8 were close to the suggested guidelines for goodness-of-fit (χ^2 = 49.166, *p* =.027, GFI = .843, RMR = 6.337, RMSEA = .106, AGFI = .730, NFI = .675, CFI = .838, and IFI = .856). Although some of results did not fully satisfy goodness-of-fit indication, the conceptual model for electronics companies was still considered a reasonable-fit structure based on the collected data.

Table 4-14

Indication of Model Fit for Conceptual Model for Electronics Companies

Evaluation item	Indication of goodness-of-fit	Actual result
χ^2	p > .05	49.166 (*p* =.027)
GFI	GFI > 0.9	.843
RMR	RMR < 0.05	6.337
RMSEA	RMSEA < 0.1	.106
AGFI	AGFI > 0.9	.730
NFI	Close to 1	.675
CFI	Close t to 1	.838
IFI	Close to 1	.856

Note. GFI: goodness of fit index. RMR: root mean square residual. RMSEA: root mean square error of approximation. AGFI: adjust goodness of fit index. NFI: normed fit index. CFI: comparative fit index. IFI: incremental fit index.

Based on the previous procedures as in offending estimates check and model fit for analysis, Figure 4-1 presented the actual estimates among constructs and sub-constructs. In this structural diagram, latent variables such as organizational commitment, teamwork, and organizations' characteristics, were shown in the oval shape. Observed variables like effective commitment, continuance commitment, normative commitment, team structure, organizational support, internal processes, year of establishment, training, ratio of employee tenures, and employee turnover rates, were shown in the rectangular shape.

As for latent variables, organizational commitment and teamwork predicted positive connection. On the contrary, organizations' characteristics revealed a negative connection with organizational commitment and teamwork. Furthermore, observed variables such as team structure, organizational support, and internal processes provided the strongest factor relationship with latent variable, teamwork. On the contrary, observed variables for organizations; characteristics possessed the lowest factor connection. The connection between organizational commitment and its constructs were moderate.

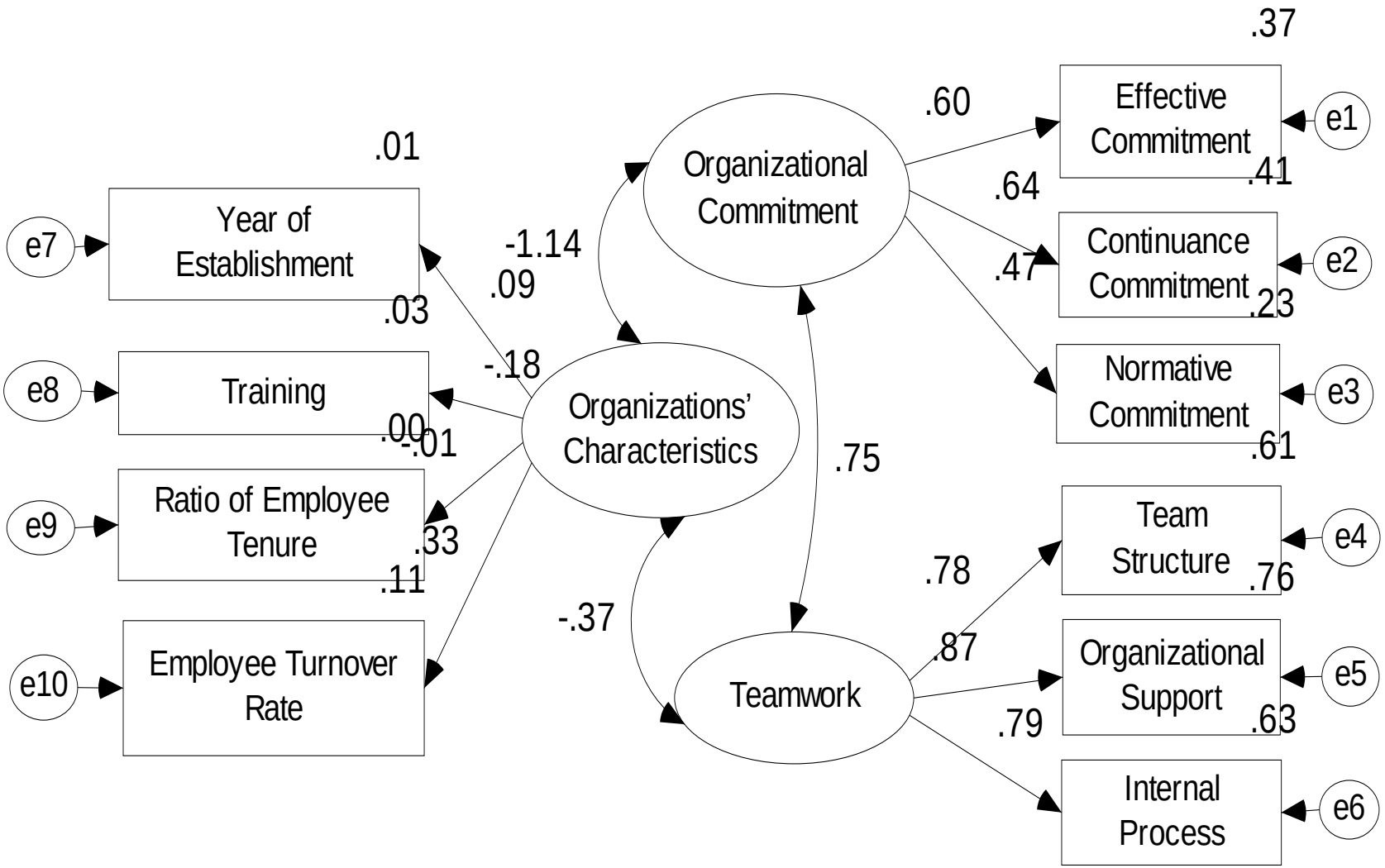

Figure 4-1. The conceptual model with paths and factors for electronics companies

Structural Equation Modeling – Non-Electronics Companies

The initial estimate check was the initial procedure to check statistical assumptions of SEM for the conceptual model in non-electronics companies. If the results exceeded the acceptable range, it indicated the conceptual model in non-electronics companies was not a good fit for the data.

As shown in Table 4-15, there was no negative estimate of standard error for observed variables. The actual values ranged from .12 to 17.91. Furthermore, estimated standardized regression were between -.06 to .86 less than 1. Both results conformed to statistical assumptions of SEM: it is not tolerant to have negative estimates of standard error and estimate standardized regression cannot be over or close 1 (Hair et al., 1995). Logistically, the conceptual model in non-electronics companies satisfied the guidelines for estimate checks.

Table 4-15

Parameter Estimation of Conceptual Model for the Latent Variables to Observed Variables for Non-Electronics Companies

Estimate	Unstandardized Estimate	S.E.	C.R.	P	Standardized Estimate
Effective commitment	1.00				.49
Continuance commitment	1.32	.53	2.49	.013	.53
Normative commitment	1.14	.43	2.68	.007	.63
Team structure	1.00				.86
Organizational support	1.12	.14	7.89	***	.86
Internal process	.95	.12	7.73	***	.85
Employee turnover rate	1.00				.05
Ratio of employee tenure	-4.43	7.28	-.61	.543	-.06
Training	.61	.76	.77	.44	.15
Years of establishment	14.02	17.91	.78	.43	.18

Note. S.E.: Approximate standard error. C.R.: Critical ratio. ***P < .001

Primarily, construct reliability was the statistical technique to assess reliability of SEM. Fornell and Bookstein (1982) stated that if the value of construct reliability was higher than .6, it meant that construct reliability was acceptable with high internal consistency. The equation of construct reliability was shown below:

$$\rho_c = \frac{\sum(\lambda)^2}{[\sum(\lambda)^2 + \sum(\theta)]}$$

ρ_c = construct reliability

λ = standardized estimate of latent variables for indicator variable

θ = error variance of observed variable

Average variance extracted was an additional choice to evaluate the reliability of SEM. Fornell and Bookstein (1981) declared that distinct validity should be higher than .5. The formula was as follows:

$$\rho_v = \frac{\sum(\lambda^2)}{[\sum(\lambda^2) + \sum(\theta)]}$$

ρ_v = average variance extracted

λ = standardized estimate of latent variables for indicator variable

θ = error variance of observed variable

The individual reliabilities of observed variables in non-electronics companies were not of high internal consistency (Table 4-16). However, the reliabilities in sub-components of teamwork were higher than sub-components of organizational commitment. The strongest reliability was organizational support with .74 and the lowest reliability was effective commitment with .24.

Regarding the construct reliability, latent variables in non-electronics companies, organizational commitment (ρ_c = .058) and teamwork (ρ_c = .111), did not reach the

acceptable level of .6. In addition, average variance extracted was less than .5: organizational commitment (ρ_v = .020) and teamwork (ρ_v = .040). These two results indicated the reliability of the conceptual model in non-electronics companies did not correspond with the statistical assumption of SEM.

Table 4-16

Individual Reliability of Observed Variables and Construct Reliability of Latent Variables with Average Variance Extracted for Non-Electronics Companies

Variable	Individual reliability	Construct reliability	AVE
Organizational commitment		.058	.020
Effective commitment	.24		
Continuance commitment	.28		
Normative commitment	.40		
Teamwork		.111	.040
Team structure	.73		
Organizational support	.74		
Internal process	.71		

Note. AVE: average variance extracted.

Goodness- of- fit tests of SEM were used to determine if the conceptual model being tested was highly consistent. This determination must include both latent variables and observed variables counted in the conceptual model. In addition, AMOS provides 25 different goodness-of-fit measures. Therefore, the choice of which the appropriate fit measure is a matter of dispute among methodologists. Consequently, a wide disagreement and argument on which fit indexes should be reported was still frequently seen (Hair et al., 1995).

The indices of goodness- of- fit reported for this study were based on two methodologists' recommendations, Jaccard & Wan (1996) and Kline (2004). They

suggested to report Chi-square, Goodness of fit index (GFI), Root mean square residual (RMR), Root mean square error of approximation (RMSEA), Adjust goodness of fit index (AGFI), Normed fit index (NFI), Comparative fit index (CFI), and Incremental fit index (IFI). The evaluation standards for the fit measures appear in Table 4-17.

The details of model fit for non-electronics companies presented in Table 4-17 indicate 1of 8 fit indices met the guidelines of goodness-of-fit precisely (χ^2 = 36.194, *p* =.279, GFI = .908, RMR = 4.458, RMSEA = .047, AGFI = .841, NFI = .796, CFI = .968, and IFI = .971). Thus, the results of goodness-of-fit for non-electronics companies were considered a strong-fit structure with the data collected. The data fit the conceptual model.

Table 4-17

Indication of Model Fit for Conceptual Model for Non-Electronics Companies

Evaluation item	Indication of goodness-of-fit	Actual result
χ^2	p > .05	36.194 (*p* = .279)
GFI	GFI > 0.9	.908
RMR	RMR < 0.05	4.458
RMSEA	RMSEA < 0.1	.047
AGFI	AGFI > 0.9	.841
NFI	Close to 1	.796
CFI	Close t to 1	.968
IFI	Close to 1	.971

Note. GFI: goodness of fit index. RMR: root mean square residual. RMSEA: root mean square error of approximation. AGFI: adjust goodness of fit index. NFI: normed fit index. CFI: comparative fit index. IFI: incremental fit index.

In the structural diagram of SEM for non-electronics companies, organizational commitment, teamwork, and organizations' characteristics were treated as latent variables in the oval shape. Other variables in rectangles in Figure 4-2 were regarded as observed variables. In addition, Figure 4-2 displayed the conceptual model with summary of the standardized path coefficient estimates for non-electronics companies.

Among all paths of constructs of standardized estimates, two paths of latent variables revealed a positive connection: organizational commitment with teamwork and organizations' characteristics with teamwork. In aspects of relationship between latent variables with observed variables, observed variables of teamwork predicted the strongest association ranging from .85 to .86.The moderate association derived from observed variables of organizational commitment ranging from .49 to .63. The lowest predictions were from observed variables of organizations' characteristics ranging from .05 to .17.

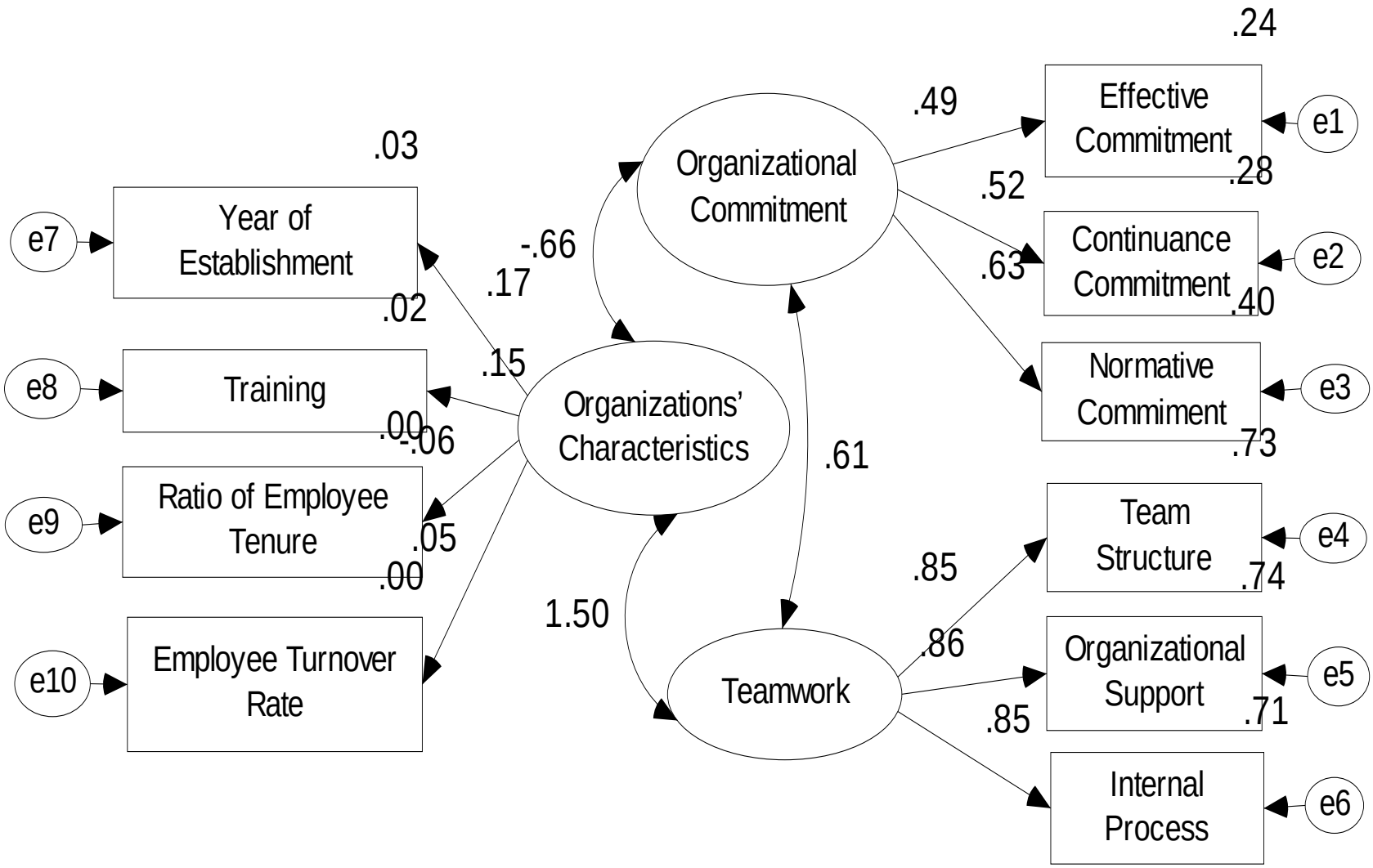

Figure 4-2. The conceptual model with paths and factors for non-electronics companies.

Chapter Summary

This chapter reported the statistical findings and results from data collected. Mainly, in aspects of descriptive statistics, the overall reliability and normality in electronics and non-electronics companies represented a fairly normal distribution. Nevertheless, the Cronbach's alpha of teamwork and its sub-components were higher than organizational commitment and its sub-components. As a result, 8 of sub-questions in organizational commitment were deleted in order to increase the reliability for further analysis using multiple regression and SEM.

Based on the results and findings of Pearson's product-moment correlation and simultaneous multiple regression, for non-electronics companies as compared to electronics companies, there was a greater degree predicting the dependent variables of teamwork and organizational commitment using independent variables, such as employee turnover rates, training, years of establishment, location, capital, and ratio of employee tenures. On the other hand, in stepwise multiple regression, only four independent variables were integrated into the analysis model due to previous statistical correlation results: training, years of establishment, ratio of employee tenure, and employee turnover rate. However, *R* square and adjusted *R* for all models were relatively low.

For SEM, the conceptual model between latent variables and observed variables in non-electronics companies presented stronger statistical assessment than that in electronics companies.

Chapter 5

SUMMARY, DISCUSSIONS, CONCLUSION, AND RECOMMENDATIONS

Introduction

The purpose of this chapter was to first summarize the findings from the data collected on electronics companies and non-electronics companies on Taiwan's stock market and then to provide implications for future research. The data not only provided answers to the three research questions, but also allowed exploration of relevant ramifications, which led to discussions, conclusions, and recommendations. Each section consists of several sub-sections which detail the implications and support the research's argument. In general, the Summary Section discusses the results as they apply to each research question. The Discussion Section presents the comparison and connection between the literature regarding electronics and non-electronics companies and the perspective of the research. This section also analyzes the study's assumptions and methodology. The Conclusion Section provides a brief summary of this study, and the final sections propose recommendations for HRD and HRM practice, methodology, and future research.

Study Review

The purpose of the study was to determine whether or not any association existed between the characteristics of those organizations which are listed on Taiwan's stock market and two organizational interventions: teamwork and organizational commitment. In addition to contributing to the field of human resource development, which was rare in similar studies, this study went a step further to offer an alternative perspective to the interaction between teamwork and organizational commitment modified by organizations'

characteristics in electronics and non-electronics companies listed on Taiwan's stock market.

The research proposed three research questions as a springboard for the main problem and purpose of this study:

1. What is the relationship between the organizations' characteristics and teamwork in electronics and non-electronics industrial companies in Taiwan?
2. What is the relationship between the organizations' characteristics and organizational commitment in electronics and non-electronics industrial companies in Taiwan?
3. To what extent is the relationship between teamwork and organizational commitment among electronics and non-electronics industrial companies in Taiwan modified by organizations' characteristics?

To ensure adopting accurate items to identify participants and to acquire the necessary data, reliability of the items in the instrument was an essential consideration. Assessment of Cronbach's alpha for reliability for the entire two scales is the basis of this study's instrument. These two scales were Meyer, Allen, and Smith's (1993) three-component conceptualization of organizational commitment and Parker's (1997) team success survey.

In terms of methodological approaches, the research simultaneously utilized both descriptive and inferential statistics for the three research questions in order to gain a comprehensive picture of data's implications. For instance, for Research Question 1 and 2, the statistical approaches included mean, standard deviation, frequency, skewness, kurtosis, and Pearson's Product-Moment Correlation, simultaneous multiple regression, and stepwise multiple regression. Additionally, the normal distribution was checked.

Regarding Research Question 3, Structural Equation Modeling (SEM) was used because it is the most appropriate and most advanced statistical technique for data analysis. Due to necessary verification of its statistical assumptions for SEM, some additional statistical techniques for good-model-fit of conceptual model were included: Maximum Likelihood Method (MLM) for normal distribution, parameter estimation for offending check, construct reliability and average variance extracted for reliability, Chi-square, Goodness of Fit Index (GFI), Root Mean Square Residual (RMR), Root Mean Square Error of Approximation (RMSEA), Adjusted Goodness of Fit Index (AGFI), Normed Fit Index (NFI), Comparative Fit Index (CFI), and Incremental Fit Index (Jaccard & Wan, 1996; Kline, 2004).

Summary of the Research Findings

The findings of this study, specific to each research question are:

Research Question 1

Overall, two independent variables, training and employee turnover rate, were the most statistically significant, predictable ones connecting with the dependent variable, teamwork, in both electronics companies and non-electronics companies on Taiwan's stock market. However, in terms of the linear combination between organizations' characteristics and teamwork, the results did not produce a high variance in both simultaneous multiple regression (R^2 = .169; ΔR^2 =.031) and stepwise multiple regression (Model 1: R^2 = .071; ΔR^2 =.061; Model 2: R^2 = .113; ΔR^2 =.095). To the contrary, the remaining independent variables did not conclude an either highly positive or a negative correlation with teamwork.

Based on the findings, training in both electronics companies and non-electronics companies had a positive influence on teamwork. In other words, the frequency of

training predicted more effective and efficient teamwork. Specifically, in electronics companies, the frequency of training strengthened the operation of internal processes, one of the sub-components of teamwork. For non-electronics companies, the frequency of training forecasted highly positive outcome from teamwork and its sub-component, organizational support.

Given the positive association of training with teamwork, on the other hand, employee turnover rate had a negative association with teamwork, especially statistically significant in non-electronics companies (r = -.348; p < .05). In other words, a higher employee turnover rate resulted in lower performance of teamwork. Besides, in terms of the sub-component of teamwork, it, nonetheless, showed different degrees of negative influence. Unequivocally, higher turnover rate had a negative effect on team structure (r = -.379; p < .01) and internal processes (r = -.393; p < .01).

Although the remainder of other organizations' characteristics were not statistically significant or allowed reporting a likely direction of association with teamwork, the findings reported differences and similarities for the influence of organizations' characteristics on teamwork in electronics companies and non-electronics companies. In terms of similarity, variables such as location, gender ratio, educational levels, compensation and benefits, earnings per share and employee profit sharing were shown to positively influence teamwork. Nevertheless, the ratio of employee tenure negatively associated with teamwork. Regarding the differences, for electronics companies, the total number of employees, years of establishment, and capital reported positive association with teamwork; however, produced evidence of negative relationships among non-electronics companies.

Research Question 2

The association between organizational commitment and organizations' characteristics in both electronics and non-electronic companies on Taiwan's stock market predicted a greater statistical relationship when compared to that between training and teamwork, especially for non-electronics companies.

From the perspective of Pearson's Product-Moment Correlation, in electronics companies, organizations' characteristics, years of establishment (r = -.332; p < .05), ratio of employee tenure (r = -.296; p < .05), and capital (r = .293; p < .05), were respectively statistically significant with two of the sub-components of organizational commitments, normative commitment and continuance commitment. In other words, greater capital in electronic companies predicted higher continuance commitment; to the contrary, longer years of establishment and a higher ratio of employee tenure would reduce normative commitment.

On the side, for non-electronics companies, overall, organizational commitment appeared to have a statistically positive significance with location, but a statistically negative significance with years of establishment, ratio of employee tenure, and capital. Further, these four independent variables also demonstrated the same directional relationship of statistically positive/negative significance with the sub-components of organizational commitment: effective commitment, continuance commitment, and normative commitment.

In terms of the linear combination of regressions between organizations' characteristics and organizational commitment for companies on Taiwan's stock market, the results reported higher variances compared to teamwork in simultaneous multiple regression with R^2 = .309; ΔR^2 =.194, and stepwise multiple regression with Model 1: R^2

= .114; ΔR^2 =*.105*; Model 2: R^2 = .158; ΔR^2 =.140*;* Model 3: R^2 = .192; ΔR^2 =.166. Among them, the years of establishment, ratio of employee tenure and employee turnover rate were the most predictable independent variables for stepwise multiple regression.

Research Question 3

Generally speaking, teamwork and organizational commitment modified by organizations' characteristics for the conceptual model proposed for non-electronics companies (χ^2 = 36.194; *p* =.279; GFI = .908; RMR = 4.458; RMSEA = .047; AGFI = .841; NFI = .796; CFI = .968, and IFI = .971) had better goodness-of-fit than those for electronics companies (χ^2 = 49.166; *p* =.027; GFI = .843; RMR = 6.337; RMSEA = .106; AGFI = .730; NFI = .675; CFI = .838, and IFI = .856) appearing on Taiwan's stock market. However, both latent variables and observed variables in the conceptual models for electronics and non-electronics companies, respectively, were normally distributed and were not contrary to the offending estimates' check in the statistical assumption for SEM.

Specifically, in the conceptual model for electronics companies, the latent variables, teamwork and organizational commitment, showed a positive association with each other; whereas, organizations' characteristics negatively correlated with teamwork and organizational commitment. In addition, compared to observed variables with each latent variable in the conceptual model, team structure, organizational support, and internal process were the most positively weighted, but years of establishment, training, ratio of employee tenure, and employee turnover rate contributed the most negatively.

In terms of the conceptual model for non-electronics companies, the paths and constructs between teamwork and organizational commitment predicted a positive relation in the conceptual model, but organizations' characteristics with teamwork and

organizational commitment reported an opposite direction. Furthermore, the strongest predicable, observed variables in the conceptual model for non-electronics companies were team structure, organizational support, and internal processes. The moderate weight of observed variables was effective commitment, continuance commitment, and normative commitment.

Discussions

Based on the findings, this section goes further to complete the picture of the relationship between organizations' characteristics and two organizational interventions: teamwork and organizational commitment. The four main sub-sections are: first a series of discussions from the findings on the comparison and connection to the literature for electronics and non-electronics companies respectively, then differences on the findings between electronics and non-electronics companies, again differences between the previous assumptions and findings, and finally reflections on the limitation and methodology for future research.

Comparison and Connection to the Literature

The discussion of comparison of and connection with literature and current findings for teamwork and organizational commitment was limited to the common variables found both in previous studies and this study. This limitation was due to the fact that some more up-to-date variables like employee profit sharing were not practiced in earlier days and not included in past research. These common variables are: gender ratio, educational levels, ratio of employee tenure, employee turnover rate, and training.

First, in terms of teamwork, the most consistent outcome from this study and previous studies (Chan, 2003; Chien, 2003; Ja, 2006; Jian, 2002) was that training had a positive influence on teamwork. For more specific variables, the results were not very

similar between this study and previous studies. For instance, the data in this study indicated that tenured employees had a negative effect on teamwork, but previous studies (Chan, 2003; Chien, 2003; Ja, 2006; Jian, 2002) stated teamwork and tenured employee were positively associated. In addition, Lee (2001) stated that employees' educational levels created an obvious difference with teamwork, but this study in both electronics and non-electronics companies reported that employees' educational levels was not statistically significant with teamwork, even though only a small, positive relationship existed. One of the commonly seen demographic variables, gender, did not reach, in this study, a consistent outcome, as was similar to previous studies (Chowdhury, 2005; Ja, 2006; Kang, Yang, & Rowley, 2006). Nevertheless, in this study, the gender variable reported a positive association with teamwork. Specifically, listed companies, on Taiwan's stock market with higher ratios of male workers, predicted higher teamwork performance for both electronics and non-electronics companies.

Secondly, in terms of organizational commitment, some similarities and differences appeared in the findings of this study as compared to previous research. The similarity is that factors of tenured employee and employee turnover rate influenced organizational commitment negatively; whereas, training could influence organizational commitment positively, which is the most conclusive result from this study in comparison to previous representative studies (Chang, 1999; Chen & Francesco, 2000; Cohem & Gattiker, 1992; Putti, Aryee, & Liang, 1989; Wong, Hui, Wong, & Law, 2001). As for the differences between this study and previous studies, the gender variable produced inconclusive results. For instance, the data from this study indicated that male workers in both electronics and non-electronics companies contributed higher organizational commitment than female workers; to the contrary, Alvi & Ahmed (1987) stated an opposite finding.

Difference between Electronics Companies and Non-electronics Companies

The comparison between electronics companies and non-electronics companies can be illustrated from two aspects: their differences and similarities in organizations' characteristics and the individual conceptual model of teamwork and organizational commitment. Regarding similarities of the effect brought by organizations' characteristics, the findings from both electronics and non-electronics companies suggested the positive correlations between teamwork and the following variables: location, gender ratio, educational levels, compensations and benefits, earnings per share, employee profit sharing and training. Conversely, the ratio of employee tenure and employee turnover rate were associated negatively. On the other hand, independent variables such as the total number of employees, years of establishment, and capital presented positive relationships with teamwork in electronics companies; however, these three variables negatively associated with teamwork in non-electronics companies.

From the aspect of organizational commitment, four independent variables: location, gender ratio, training, and compensation and benefits, positively correlated with organizational commitment in both electronics and non-electronics companies. To the contrary, three independent variables: years of establishment, ratio of employees' tenure, and employee profit sharing, concluded a negative correlation. Moreover, electronics companies and non-electronics companies had opposite findings for some independent variables. For instance, while a positive prediction appeared between organizational commitment and variables such as total number of employees, educational levels, and capital, for electronics companies, the relationship was quite the reverse for non-electronics companies. Similarly, employee turnover rate and earnings per share

negatively associated with organizational commitment in electronics companies; whereas, they were positively associated in non-electronics companies.

Comparison of Assumptions and Findings

Chapter 1 proposed four assumptions before actually beginning the data collection. The following four paragraphs are the discussion of the four assumptions and the actual results.

Regarding the first assumption, non-electronics companies ranked higher in organizational commitment than electronics companies. After the analysis of Pearson's Product-Moment Correlation, the results corresponded with the first assumption. This is due to the appearance of four statistically significant correlations among twelve organizations' characteristics in non-electronics companies; however, no statistically significant correlation occurred for electronics companies

The next assumption was that electronics companies adopt a more advanced concept of teamwork as compared to non-electronics companies. The actual result from the data did not present a consistent connection to the second assumption. From the viewpoint of Pearson's Product-Moment Correlation, electronics companies only had one correlation statistically significant for teamwork and its sub-components among the 48 correlations. Conversely, non-electronics companies had 5 correlations, statistically significant for teamwork, and its sub-component among the 48 correlations. Hence, this obvious result illustrated that non-electronics companies adopt a more comprehensive concept of teamwork as compared to electronics companies.

In the third assumption, higher organizational commitments resulted from lower employee turnover rate, higher earnings per share, higher rate of employee profit sharing, and complete compensation and benefits packages. Basically, different expected variables

showed different correlations between electronics and non-electronics companies instead of showing a combined positive effect on organizational commitment. For instance, while lower employee turnover rate led to a higher level of organizational commitment in electronics companies, in non-electronics companies it was the higher earnings per share that contributed to higher organizational commitment. In addition, surprisingly, higher employee profit sharing did not result in a higher level of organizational commitment; nevertheless this result was not statistically significant. Finally, the most consistent finding in this regard was the positive association brought by compensation and benefits. The more complete the compensation and benefits package was, the higher the degree of organizational commitment would result.

Finally on the last assumption of the interaction between teamwork and organizational commitment, the assumption was that more effective and efficient teamwork resulted in a higher degree of organizational commitment. The results from data analysis matched the assumption. Generally speaking, the study reported strong estimates between teamwork and organizational commitment in the individual conceptual model of electronics and non-electronics companies

Reflections on Methodology

Given that a very powerful technique like Structural Equation Modeling (SEM) was applied for the more advanced statistical analysis in this study, it did not necessarily translate into the absolute representation of the relationship between variables due to some still debating issues in the statistical field. Specific to this study are two: the take on the sample size and the management of missing data and outliers. Details are as follows.

The basic concept of SEM is covariance and a large-sample technique, and it is not necessarily a hypothesized base for latent variables (Kline, 2005). Primarily, the

application of this statistical technique has two goals: “to understand patterns of correlations among a set of variables, and to explain as much of their variance as possible with a model specified by the researcher” (p. 13).

Today, no absolutely consistent standard has been set for the appropriate sample size for SEM analysis because literature contains no compelling discussion of the relationship between sample size and model complexity. Hypothetically speaking, simple conceptual models require fewer parameters, thus a smaller sample size; however, simple models may not have a strong foundation to support discussion and exploration (Kline, 2005). Consequently, Kline (2005) proposed a guideline for an acceptable sample size for SEM: less than 100 is considered small, between 100 and 200 is considered a medium sample size, and greater than 200 is considered a large sample size. In addition, Kline (2005) stated an alternative viewpoint of sample size based on the number of parameters. Generally speaking, a recommendable ratio between sample size and the number of parameters is 10:1 and the minimum acceptable ratio is 5:1. For instance, a conceptual model with 10 parameters should have a minimum sample size of 50.

As for this study, the number of parameters set for the proposed conceptual model was 13. Therefore, the minimum acceptable sample size should be 65 cases. However, 131 returned surveys among an estimated, potential 234 sample, produced a 95% confidence level from the target population of 584 listed companies on Taiwan’s stock market. Of the 131 surveyed companies, 54 (41.22%) were electronics companies, and 77 (58.78%) were non-electronics companies for their future analysis between teamwork and organizational commitment modified by organizations’ characteristics. In this regard, the sample size of electronic companies (n= 54) in this study was below the acceptable minimum range, but the number of non-electronics companies was above the minimum.

According to this factor, it might plausibly explain that the conceptual model for non-electronics companies reported more results with significance and better predictions in construct reliability, average variance extracted, and model fit than that for electronics companies.

Contingent with this sample size issue, it could also be postulated alternatively at this point as to how the Research Question 3 in this study, the interaction of teamwork and organizational commitment modified by organizations' characteristics, was originally analyzed. What was done with Research Question 1 and 2 was to have electronics and non-electronics companies individually categorized and analyzed. In accordance with this path, it was assumed that that these two categories would show differences in their findings on Research Question 3. Nevertheless, given the aforementioned consideration of the less than satisfactory sample size from electronics companies, a combined analysis might offer a different look on its final conceptual model. This approach, though, had better be checked and coordinated with the adjustment or adaptations of other necessary points in the overall study design in advance.

In consideration of missing data and outliers, some of the returned surveys in this study did not have complete responses to all items in the questionnaire. Those surveys had to be excluded from data analysis, and the result was an overall decrease in the survey's return rate. Consequently, these incomplete surveys diminished the options, flexibility, reliability, and validity of advanced statistical techniques.

Regarding the outliers of this study, to adapt the entire data set to the normal distribution required excluding a small number of surveys from data analysis when screening the raw data. However, a few of these excluded outliers were from representative electronics companies listed on Taiwan's stock market, thus reducing the

number of electronics companies in the data set and decreasing the potential to explore a more realistic picture of teamwork and organizational commitment modified by organizations' characteristics among this segment of companies.

Conclusion

To sum up, the most predicable variables of organizations' characteristics influencing teamwork and organizational commitment among those on Taiwan's stock market were years of establishment, training, ratio of employee tenure, and employee turnover rate. Nevertheless, the results of *R* square and adjusted *R* for stepwise multiple regression and simultaneous multiple regression were not highly predictable. This was the result of the exclusion of incomplete surveys and outliers canceling the possibility of presenting a more realistic overview for electronics and non-electronics companies listed on Taiwan's stock exchange.

As for the proposed conceptual model, the paths and constructs in both electronics and non-electronics companies illustrated and reflected a highly positive association between teamwork and organizational commitment and lower, negative impact from organizations' characteristics on teamwork and organizational commitment. Besides, the conceptual model for non-electronics companies reported a stronger statistical model fit than that for electronics companies in aspects of construct reliability, average variance extracted, and model fit.

Recommendations

Recommendations for HRD and HRM Practice

From the findings, two suggestions could be meaningfully provided to HR professionals for the organizational development from the employees' anticipated improved performance in teamwork and commitment from HR efforts. One pertains to

the HRD practice concerning training effectiveness while the other HRM practice about the care to employees. Details are as follows.

First of all, training still plays an influential role where more attuned attention to differences should be implemented. As the results and findings indicated, two independent variables, years of establishment and ratio of employee tenure, were negatively associated with teamwork and organizational commitment respectively. In the meantime, training had a positive influence. Further supported from the demographic data was that the average ratio of employee tenure in electronics companies (57.42%) and non-electronics companies (69.7 %) on Taiwan's stock market was greater than 50%. This means experienced employees were given a great weight in those companies, but unfortunately their professional training did not boost their teamwork performance and commitment toward their companies as their tenure increased. Thus, for HRD practice and intervention, enhancing the ongoing effectiveness and efficiency of training can reduce the negative impact from these two variables on teamwork and organizational commitment. To argue this point further, designing general training topics or content may not sufficiently attract tenured employees' attention or to lower its negative impact on teamwork and organizational commitment. Therefore, customized, interactive, and up-to-date training sessions for employees based on their work specifications can achieve the purpose of preferred employee development both in professional knowledge and interpersonal skills.

For the practice of HRM, in both electronics and non-electronics companies, more complete compensation and benefits predicted a higher degree of teamwork and organizational commitment. However, not every employee is totally familiar with the compensation and benefits with which their companies can assist and provide. To tackle

this ambiguity, HRM professional should make the details/information of compensations and benefits clear and known to every employee through various sources on every possible occasion. Some strategies include to circulate such information electronically and regularly or to hold the regular seminars/ workshops. Moreover, a broad concept of Employee Assistance Program (EAP) should apply, so employees can be aware of their legal rights and availability of immediate assistance when facing problems. Besides, HR practitioners should be devoted wholeheartedly to serving to alleviate employees' difficulties so that employees can focus on their work to increase their job performances.

Recommendations for Methodology

Methodologically speaking, an alternatively promising suggestion is on the statistical adjustment or treatment of the incomplete or extreme information/ cases from the original data for its comprehensiveness while logically and properly considering the relationship between variables.

Due to the assessment of normal distribution in this study, exclusion of some surveys with incomplete information and outliers was necessary prior to data analysis. However, according to the current trend of data analysis, incomplete surveys and outliers may likely generate some significant discoveries. Hence, comparison and contrast between the cases in the normal distribution and outliers will be the next emerging issue in the field of social science, which certainly requires more methodological efforts in future research.

From the take on the sample size, the divided group in the sample size may be presumed for a detailed statistical analysis on relations between variables; nevertheless it may also lessen or limit the reliability, validity, and flexibility of advanced further statistical techniques. On the other hand, it is not suggested for the sake of manipulative

concerns or fancy presentation that a certain complex but inappropriate statistical technique be used without considering the essence of various variables in the study. Or in some other cases, different variables tend to be combined or divided without logical introspection, which generates the likeliness to distort the main purpose of the study. Consequently, having the entire data for data analysis with the appropriate adjustment for missing cases or outliers is an alternatively viable analytic strategy.

Recommendations for Future Research

Even though this study aimed to tap into the big picture of the intertwining relationship between teamwork, organizational commitment, and organizations' characteristics, there remains a lot to be further explored in future studies. What come below are three directions, which are to increase the pool size, to set variables in a timely or relative manner, and to recruit different kinds of participants for comparison.

To begin with, this study only investigated the correlation of variables from three categories, teamwork, organizational commitment, and organizations' characteristics, from the randomly selected electronics and non-electronics companies on Taiwan's major stock market. Hence, in the future research, including other two sub-major stock markets will bring to this landscape a more valid picture of the capital market in Taiwan because it will have a larger sample size for advanced data analysis. This will not only strengthen the theoretical foundation but also explore the more detailed interaction or association between the available parameters.

Secondly, it matters for researchers to constantly check on variables for inclusion in a relative or timely manner. Regarding the former, for instance, in this study only the frequency of training and compensation and benefits were counted in the coding process without differentiating more nuances in these two categories. In the future research, the

interaction between the actual types of training, compensation, and benefits influencing teamwork and organizational commitment could be specified. As to the timely concern, it has something to do with the inclusion of updated variables. A case in point is the employee profit sharing as one of the organizations' characteristics, which was definitely not seen in previous similar studies. More variables with the potential for future consideration specific to each category are as follows. In terms of organizations' characteristics, they could be monthly sale, external economy environment, risk index, financial prediction, human capital prediction, and management style. For teamwork, they could be the typology of leadership and empowerment

A final recommendation is to examine this topic by having different kinds of participants for data collection for the viably potent comparison. The results of this study were based on HRD perspectives toward teamwork and organizational commitment. However, to cater to the needs and to address the concerns other kinds of professionals may encounter and have, for future research, researchers are encouraged to expand their pool of participants by recruiting managers or employees particularly on this topic. Therefore, divergent perspectives can be presented, compared and contributed to the making of more applicable implications.

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Appendix A

Questionnaire and Consent Form for Survey

(English Version)

Implied Informed Consent Form for Social Science Research
The Pennsylvania State University

Title of Project:
Organizations' Characteristics Influence on Teamwork and Organizational Commitment in Taiwan

Principal Investigators:
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1. **Purpose of the Study**
   The purpose of this study is to determine if there is an association between organizations' characteristics in listed companies in Taiwan and two of organizational interventions, teamwork and organizational commitment.
2. **Procedures to be followed**
   You will be asked to answer 67 questions on a survey.
3. **Duration**
   It will take about 15 to 20 minutes to complete the survey.
4. **Statement of Confidentiality**
   Your participation in this research is confidential. In the survey, you will not be asked any questions that would reveal any personal information. In the event of any publication or presentation of the following research, no personally identifiable information will be shared because your name is in no way linked to your responses.
5. **Right to Ask Questions**
   Please contact Yin-Che Chen at (814) 777-4944, with questions or concerns about this study.
6. **Voluntary Participation**
   Your decision to participate in this research is totally voluntary. You can stop at any time. You do not have to answer any questions you do not want to answer.

You must be 18 years of age or older to take part in this research study.

Completion and return of the survey implies that you have read the information in this form and consent to take part in the research. Please keep this form for your records or future reference.

Organizational Commitment

Instruction:

The purpose of this section is to measure the level of organizational commitment among listed companies in Taiwan. Each question below ranges from strongly disagree to strongly agree with a7-point level of measurement. Please mark your only one answer in the corresponding blank based on your actual experience or feedback toward your organization.

Affective Organizational Commitment

1. I would be very happy to spend the rest of my career with this organization.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

2. I enjoy discussing my organization with people outside it.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

3. I really feel as if this organization's problems are my own.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

4. I think that I could easily become as attached to another organization as I am to this one. (R)
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

5. I do not feel like part of family at my organization.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

6. I do not feel emotionally attached to organization. (R)
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

7. This organization has a great deal of personal meaning for me.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

8. I do not feel a strong sense of belonging to my organization. (R)
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

Continuance Organizational Commitment

1. I am not afraid of what might happen if I quit my job without having another one lined up. (R)
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

2. It would be very hard for me to leave my organization right now, even if I wanted to.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

3. Too much in my life would be disrupted if I decided I wanted to leave my organization now.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

4. It would not be too costly for me to leave my organization now. (R)
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

5. Right now, staying with my organization is a matter of necessity as much as desire.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

6. I feel I have too few options to consider leaving this organization.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

7. One of the few serious consequences of leaving this organization would be the scarcity of available alternatives.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

8. One of the major reasons I continue to work for this organization is that leaving would require considerable sacrifice-another organization may not match the overall benefits I have here.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

Normative Organizational Commitment

1. I think that people these days move from company to company too often.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

2. I do not believe that a person must always be loyal to his or her organization. (R)
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

3. Jumping from organization to organization does not seem at all unethical to me. (R)
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

4. One of the major reasons I continue to work for this organization is that believe that loyalty is important and therefore feel a sense of moral obligation to remain.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

5. If I got another offer for a better job elsewhere I would not feel it was right to leave my organization.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

6. I was taught to believe in value of remaining loyal to one organization.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

7. Things were better in the days when people stayed with one organization for most of their career. (R)
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

8. I do not think that wanting to be a company man or company woman is sensible anymore. (R)
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

Team Success Survey

Instruction:

The purpose of this section is to measure the level of teamwork among listed companies in Taiwan. Each question below ranges from strongly disagree to strongly agree with a 7-point level of measurement. Please mark your only one answer in the corresponding blank based on your actual experience or feedback toward your organization.

Team Structure

1. We set clear time limits and deadlines for our work.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

2. We have established effective relationships with support groups and other people who are critical to our success.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

3. We have a clear set of performance objectives and a detailed plan for reaching our objectives.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

4. Our team task engages and motivates the members of our team.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

5. Our team includes all of the right people.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

6. Our team is small enough to be effective.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

7. Our team meetings are well-run and effective.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

8. We make effective use of non-meeting methods to communicate with one another.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

9. Our relationships with our customers are excellent.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

10. Everyone is clear about his/her role on this team.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

Organizational Support

1. Management provides our team with clear direction regarding its expectation for the team.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

2. Functional department managers support the work of our team.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

3. We have received sufficient training in how to be an effective team.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

4. We are empowered to set specific objectives for the team within the context of the direction provided by management.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

5. We have easy access to all the information we need to compete our task.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

6. We have necessary tools and equipment to compete our task.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

7. The organization’s reward system supports the importance of team performance rather than individual performance.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

8. The organization's performance-appraisal system includes our performance on cross-functional teams.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

9. The management team serves as a role model of effective team performance.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

10. Once our objectives are approved, we are empowered, within reason, to do whatever it takes to reach those objectives.
    ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
    ☐ Slight Agree ☐ Agree ☐ Strongly Agree

Internal Processes

1. Team members fulfill their commitment.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

2. There is a high level of trust among team members.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

3. Communication among team members is open and honest.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

4. Disagreements among team members are openly discussed and effectively resolved.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

5. Key decisions requiring the commitment of team members are made by the consensus method.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

6. Members consistently use active listening skills when communicating with one another.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

7. Members are open to new ideas.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

8. Members of this team work hard at making the team successful.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

9. We are effective at eliciting and using the ideas, information, and opinions of all team members.
   ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
   ☐ Slight Agree ☐ Agree ☐ Strongly Agree

10. Our team leader does what is necessary to facilitate the accomplishment of our task and the building of the team as a unit.
    ☐ Strongly Disagree ☐ Disagree ☐ Slight Disagree ☐ Neutral
    ☐ Slight Agree ☐ Agree ☐ Strongly Agree

Organizations' Characteristics

1. Total Number of Employees: _____

2. Year of Establishment: _____

3. Industrial Category

☐ Cement	☐ Food	☐ Plastics	☐ Textiles	☐ Electric Machinery
☐ Electrical & Cable	☐Chemical Industry	☐Glass Ceramics	☐Paper Pulp	☐Steel Iron
☐Rubber	☐Automobile	☐Electronics	☐Building Material and Construction	☐Shipping & Transportation
☐Tourism	☐Financial & Insurance	☐Department Stores	☐Other	

4. Location:

☐Changhua County	☐Chiayi	☐Chiayi County	☐Hsinchu	☐Hsinchu County
☐Hualien County	☐Kaohsiung	☐Kaohsiung County	☐Keelung	☐Kinmen County
☐Lienchiang County	☐Miaoli County	☐Nantou County	☐Penghu County	☐Pingtung County
☐Taichung	☐Taichung County	☐Tainan	☐Tainan County	☐Taipei
☐Taipei County	☐Taitung County	☐Taoyuan County	☐Yilan County	☐Yunlin County

5. Capital: $NT _____

6. Earnings per Share: $NT _____

7. Rate of Employee Profit Sharing: _____ %

8. Ratio of Tenure Employee: _____ %

9. Ratio of Gender: _____ % (Male/Female)

10. Ratio of Employees' Education Level

    High School _____ %

    College _____ %

    Master Degree _____ %

    Doctoral Degree _____ %

11. Employee Turnover Rate: _____ %

12. Various Aspects of Training (Multiple Choices)

    ☐ Cognitive training (knowledge learning)

    ☐ Psychomotor training (physical skills)

    ☐ Affective training (attitudes, values, and interests)

13. Various Types of Compensation and Benefits (Multiple Choices)

Individual: ☐ Legal Adviser ☐ Tourism Grant ☐ Telecom Subsidies

☐ Birthday Gift ☐ Emergency Grant ☐Regular Health Check

☐ Education Grant ☐ Transport Allowance ☐ Low Interest Loans

☐ Tea Time ☐ Medicaid

Group: ☐Staff Travel ☐ Movie ☐ Leisure Activities ☐ End Dinner For

Employees ☐ Club ☐ Birthday Activities ☐ Community Grants

☐Dinner Sector ☐ Tourism Sector ☐ Sports Leisure Programs

Family: ☐ Family Day ☐ Child Care ☐ Campaign Garden ☐ Gym

☐ Housing Mortgage Subsidy ☐ Medicaid Families

Bonus: ☐ Bonus Shares ☐ Performance Bonuses ☐ Holiday Bonus

Working hour: ☐ Summer Vacation ☐ Flexible Leave ☐ Spring Break

☐ Child Care Leave ☐ Flexible Working Hours ☐ Campaign Time

☐Better Labor Standards Law

Facility: ☐ Parking ☐ Library ☐ Dorm ☐ Child Care Facilities

☐ Employee Restaurant ☐ Smoking Room ☐ Dietitians ☐ Gym Room

☐ Shuttle

Appendix B

Questionnaire and Consent Form for Survey

(Chinese Version)

組織特性對團隊運作與組織認同之影響研究

敬啟者：

您好！這是一份學術問卷，主要的目的在探討『組織特性』對『團隊運作』與『組織認同』的影響，希望透過您寶貴的意見，作為本研究重要參考依據。

現在請您花費十五分鐘的時間參閱以下的問題與說明，並針對各項予以評價，您所有的填答都只作為學術研究之用，於分析報告也僅呈現整體統計結果，不會出現個別資料，請您安心填答。

您所提供的資料與意見對本研究非常重要與珍貴，懇切期盼您的參與，僅致上十二萬分的謝意與最誠摯的祝福。

敬頌

鈞安

美國賓州州立大學

人力資源教育與發展研究所

指導教授 Edgar I. Farmer 博士

研 究 生 陳殷哲 敬上

民國 九十七 年 十 月 三 十 日

※ 本問卷希望由人力資源主管填寫，
如有任何疑問請以下方式與我連絡。

0953323859

yuc150@psu.edu

第一部份：組織承諾

填答說明
本量表在於衡量台灣上市公司組織承諾的程度，每個題目答案區分等級均從『非常不同意』到『非常同意』，依個人感受程度分成七個等級，請您依自己實際在組織內對問題的看法，在每題右邊適合的方格□中打勾。

一、情感性	完全不同意	不同意	有點不同意	無意見	有點同意	同意	完全同意
1. 我很希望待在本公司工作一直到退休。	□	□	□	□	□	□	□
2. 我喜歡與公司以外的人討論到我的公司。	□	□	□	□	□	□	□
3. 我覺得公司的問題就是我的問題。	□	□	□	□	□	□	□
4. 我對於其它公司的認同感等同於目前的公司。	□	□	□	□	□	□	□
5. 我覺得我是公司的成員之一。	□	□	□	□	□	□	□
6. 我對於其它公司沒有情感上的認同。	□	□	□	□	□	□	□
7. 本公司對我而言有著非常重要意義。	□	□	□	□	□	□	□
8. 我對公司沒有強烈的歸屬感。	□	□	□	□	□	□	□

二、連續性	完全不同意	不同意	有點不同意	無意見	有點同意	同意	完全同意
1. 我不擔心如果我辭職後，沒有人接替我的工作。	□	□	□	□	□	□	□
2. 離開目前的公司，即便是出於自願，對我而言仍是一件困難的事。	□	□	□	□	□	□	□
3. 如果現在我決定離開公司，這將會瓦解我的生活。	□	□	□	□	□	□	□
4. 如果現在我決定離開公司，我將不會有財務上太大的損失。	□	□	□	□	□	□	□
5. 待在目前公司工作能使我得到滿足。	□	□	□	□	□	□	□

	完全不同意	不同意	有點不同意	無意見	有點同意	同意	完全同意
6. 我覺得離開本公司的機會並不多。	□	□	□	□	□	□	□
7. 我無法預期離開本公司後的損失。	□	□	□	□	□	□	□
8. 促使我留在本公司繼續工作的因素是本公司的福利優於其它公司。	□	□	□	□	□	□	□

三、規範性	完全不同意	不同意	有點不同意	無意見	有點同意	同意	完全同意
1. 我覺得現在的員工更換工作的頻率太過於頻繁。	□	□	□	□	□	□	□
2. 我不認為員工必須要對公司忠誠。	□	□	□	□	□	□	□
3. 轉換公司對我而言不是一件不道德的事情。	□	□	□	□	□	□	□
4. 我相信保有忠誠度是一件很重要的義務，它促使我繼續待在本公司工作。	□	□	□	□	□	□	□
5. 如果其它公司能提供我更好的工作機會，我也不認為離開目前的公司是一件正確的決定。	□	□	□	□	□	□	□
6. 我被教導「保有對公司的忠誠度」是一種信仰。	□	□	□	□	□	□	□
7. 員工會長期為一間公司工作，是由於過去該公司具有較佳的工作環境及制度。	□	□	□	□	□	□	□
8. 我不認為員工成為公司的「乖乖牌」是一件明智的行為。	□	□	□	□	□	□	□

第二部份：團隊運作

填答說明
本量表在於衡量台灣上市公司團隊運作的程度，每個題目答案區分等級均從『非常不同意』到『非常同意』，依個人感受程度分成七個等級，請您依自己實際在組織內對問題的看法，在每題右邊適合的方格□中打勾。

一、團隊結構	完全不同意	不同意	有點不同意	無意見	有點同意	同意	完全同意
1. 對於團隊的工作，我們會制定明確的時間與期限。	□	□	□	□	□	□	□
2. 對於某些會影響團隊成功的對象，我們會建立有效的合作關係。	□	□	□	□	□	□	□
3. 我們團隊有一個明確的工作目標與詳細計劃，來達成團隊的目標。	□	□	□	□	□	□	□
4. 我們團隊的任務在於激勵團隊的成員。	□	□	□	□	□	□	□
5. 我們團隊成員都是適當的人選。	□	□	□	□	□	□	□
6. 我們團隊之所以有效率，是由於團隊規模較小。	□	□	□	□	□	□	□
7. 我們的團隊會議能夠有效率的進行。	□	□	□	□	□	□	□
8. 我們能有效地使用非會議的形式進行溝通。	□	□	□	□	□	□	□
9. 我們團隊與客戶保持非常好的關係。	□	□	□	□	□	□	□
10. 每個團隊成員都清楚了解自己在團隊裡所扮演的角色。	□	□	□	□	□	□	□

二、組織支持	完全不同意	不同意	有點不同意	無意見	有點同意	同意	完全同意
1. 管理階層清楚地規定團隊的方向。	□	□	□	□	□	□	□
2. 管理階層支持團隊管理的運作。	□	□	□	□	□	□	□

	完全不同意	不同意	有點不同意	無意見	有點同意	同意	完全同意
3. 為了成為有效的團隊，團隊接受了充分的訓練。	□	□	□	□	□	□	□
4. 我們團隊能得到上級單位充分的授權。	□	□	□	□	□	□	□
5. 團隊很容易的取得所需的資訊來完成任務。	□	□	□	□	□	□	□
6. 團隊為了達成任務所需的資源是足夠的。	□	□	□	□	□	□	□
7. 公司的獎勵制度會影響團隊的表現。	□	□	□	□	□	□	□
8. 公司的評估系統涵蓋了團隊的表現。	□	□	□	□	□	□	□
9. 上級管理階層是團隊運作的典範。	□	□	□	□	□	□	□
10. 一但團隊得到了授權，團隊會盡全力達成預定的目標。	□	□	□	□	□	□	□

三、內部過程	完全不同意	不同意	有點不同意	無意見	有點同意	同意	完全同意
1. 團隊成員會履行對團隊的承諾。	□	□	□	□	□	□	□
2. 團隊成員之間會相互信任。	□	□	□	□	□	□	□
3. 團隊成員會以開放及真誠的態度表達個人的意見。	□	□	□	□	□	□	□
4. 團隊成員的歧見可以公開討論與有效解決。	□	□	□	□	□	□	□
5. 團隊的重要決定是經由成員討論後決定的。	□	□	□	□	□	□	□
6. 團隊成員會以聆聽的態度進行溝通。	□	□	□	□	□	□	□
7. 團隊成員的創新想法是可以被接納的。	□	□	□	□	□	□	□
8. 團隊的成功是由於成員不懈的努力。	□	□	□	□	□	□	□
9. 團隊的有效運作是來自於成員間的討論、建議與報告。	□	□	□	□	□	□	□
10. 團隊領導者會盡一切的努力來幫助團隊達成預定的目標與任務。	□	□	□	□	□	□	□

第三部分：公司基本資料

1. 員工總數：_____人
2. 公司成立時間：民國_____年
3. 公司產業類別：

   □水泥工業 □食品工業 □塑膠工業 □紡織纖維 □電機機械 □電器電纜

   □化學(生計醫療) □玻璃陶瓷 □造紙工業 □鋼鐵工業 □橡膠工業

   □汽車工業 □電子工業 □建材營造 □運輸業 □觀光事業 □金融保險

   □貿易百貨 □其它
4. 總公司所在縣市：

   □台北市 □高雄市 □台北縣 □基隆市 □新竹市 □台中市 □嘉義市

   □台南市 □桃園縣 □新竹縣 □苗栗縣 □台中縣 □彰化縣 □南投縣

   □雲林縣 □嘉義縣 □台南縣 □高雄縣 □屏東縣 □宜蘭縣 □花蓮縣

   □台東縣 □澎湖縣
5. 公司資本額：新台幣$_____億
6. 近三年每股盈餘平均：_____
7. 員工分紅比率：_____%
8. 資深員工比率：_____% (員工工作年資超過 3 年以上)
9. 員工性別比率：_____% (男生/女生)
10. 員工教育程度分布：

    高中：_____%

    大學：_____%

    碩士：_____%

    博士：_____%

11. 去年員工離職率：：_____%

12. 員工教育訓練類別：(複選題)

□認知層次訓練(知識性學習)

□心理層次訓練(技能性學習)

□情感層次訓練(態度與價值觀性學習)

13. 員工福利類型：(複選題)

個人型：□法律顧問□旅遊補助 □電信費補助 □生日禮物 □急難補助

□定期健檢 □進修補助 □交通津貼 □低利貸款 □午茶

□醫療輔助

團體型：□員工旅遊 □電影欣賞 □康樂性活動 □尾牙 □俱樂部

□慶生活動 □社團補助 □部門聚餐 □部門旅遊 □運動休閒課程

家庭型：□家庭日親子活動 □子女托育 □運動園遊會 □員工眷屬健身房

□購屋貸款補助 □家屬醫療補助

獎金型：□入股分紅 □績效獎金 □三節獎金

工時型：□暑假 □彈休假 □春假 □育嬰假 □彈性工時 □運動時間

□優於勞基法休假制度

設施型：□停車場 □圖書館 □宿舍 □托兒設施 □員工餐廳 □抽煙室

□營養師 □健身房 □交通車

本問卷到此全部完畢，非常感謝您耐心的填答，及衷心感謝您的協助!

Appendix C

Human Subject Protections Approval

From: "Young, Laura" <lfs105@psu.edu>

To: "yuc150@psu.edu" <yuc150@psu.edu>

Subject: IRB#29558 - Organizations' Characteristics Influence on Teamwork and Organizational Commitment in Taiwan

Date: Mon, Feb 16, 2009 01:57 PM

Hi Yin-Che,

The Office for Research Protections (ORP) has reviewed the modification for the above referenced study. This request does not change the exemption status and this study continues to be exempt from IRB review. You may continue with your research.

MODIFICATION REVIEW CATEGORY:

Category 2: Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observations of public behavior unless: (i) information obtained is recorded in such a manner that human participants can be identified, directly or through identifiers linked to the participants; **and** (ii) any disclosure of the human participants' responses outside the research could reasonably place the participants at risk of criminal or civil liability or be damaging to the participants' financial standing, employability, or reputation. [45 CFR 46.101(b)(2)]

COMMENT: Approval of the February 13, 2009 modification request has been granted. Â Approval includes a title change.

PLEASE NOTE THE FOLLOWING:

Â· Include your IRB number in any correspondence to the ORP.

Â· The principal investigator is responsible for determining and adhering to additional requirements established by any outside sponsors/funding sources.

Â· **Record Keeping**

- The principal investigator is expected to maintain the original signed informed consent forms, if applicable, along with the research records for at least three (3) years after termination of the study.

- This will be the only correspondence you will receive from our office regarding this modification determination.

  - Â§ **MAINTAIN A COPY OF THIS EMAIL FOR YOUR RECORDS.**

Â· **Consent Document(s)**

- The exempt consent form(s) will no longer be stamped with the approval/expiration dates.

- The most recent consent form(s) that you sent in for review is the one that you are expected to use.

Â· **Follow-Up**

- The Office for Research Protections will contact you in three (3) years from the date of original determination to inquire if this study will be on-going.

- If the study is completed within a three year period from the date of original determination, the principal investigator may complete and submit a **Project Close-Out Report**. (http://www.research.psu.edu/orp/areas/humans/applications/closeout.rtf)

Â· **Revisions/Modifications**

- Any changes or modifications to the study must be submitted to the Office for Research Protections on the *Modification Request Form - Exemption* available on our website:

  http://www.research.psu.edu/orp/areas/humans/applications/modrequest.rtf

- **Modifications will not be accepted unless the Modification Request Form is included with the submission.**

Please do not hesitate to contact me if you have any questions or concerns. Â Thank you,

Laura Sabolchick Young

The PennsylvaniaStateUniversity | Office for Research Protections | 201 Kern Graduate Building | University Park, PA16802 | Phone: (814) 863-1459 | Fax: (814) 863-8699 | www.research.psu.edu/orp

Appendix D

Copyright Permissions

From: "Glenn Parker" <glennparker@verizon.net>

To: YIN-CHE CHEN <yuc150@psu.edu>

Subject: Request permission

Date: Sun, Aug 10, 2008 04:43 PM

Please include a note on each page of the survey that states that the survey is copyrighted by me and may not be reproduced for any purpose without my permission.

Thank you and good luck with your research.

---glenn

Glenn Parker Team Building Consultant
36 Otter Creek Road Skillman, NJ 08558
609-333-0203 609-333-0204 (Fax)
glenn@glennparker.com www.glennparker.com

From: <support@flintbox.com>

To: yuc150@psu.edu

Subject: Flintbox - License Agreement for Student License for Use of the Survey in a Single Student Research Project (Academic Users Guide - Dec 2004.pdf)

Date: Tue, Aug 26, 2008 08:39 PM

flintbox® | where IP connects

Licensee: Yin-Che Chen
Pennsylvania State University
265 Blue Course Dr 27A
State College, Pennsylvania
16803
USA
814-777-4944

Project: TCM Employee Commitment Survey - Academic Package - Student License for Use of the Survey in a Single Student Research Project (Academic Users Guide - Dec 2004.pdf)

Date: 26 August 2008 17:39 PST

TCM EMPLOYEE COMMITMENT SURVEY LICENSE AGREEMENT – FOR STUDENT USE

VITA

Yin-Che Chen

EDUCATION

Aug 2007 - May 2009	The Pennsylvania State University, **Ph.D, Workforce Education and Development**
Jan 2007 - July 2007	The Pennsylvania State University, **Master Study, Workforce Education and Development**
Jan 2006 - Dec 2006	Pittsburg State University, **Master, Human Resource Development**
Aug 1997 - Jun 2002	Feng-Chia University, **Bachelor, Cooperative Economics**

WORKING EXPERIENCE

May 2008 - June 2008 **Instructor**. North Carolina Agricultural and Technical State University, U.S.A.

- Teaching MFG 495 Statistical Processes and Quality Control for upper-level undergraduates of Summer Session I
- Developing four course syllabus: MFG 310 Human Resources in Manufacturing, MFG 511 Lean Manufacturing, MFG 510 Leadership for Total Quality Management, and MFG 512 Assets Maintenance.

SELECTED PUBLICATIONS

1. Chen, Y. C., Chen, Y. C., & Tsao, Y. L. (2008). A trajectory of the curricular changes in vocational education in Taiwan. *International Journal of Applied Educational Studies, 1*(1), 14-24.
2. Chen, Y. C., & Chen, Y. C. (2008). Teachers' characteristics and advanced technology proficiency. *International Journal of Applied Educational Studies, 2*(1), 49-61.
3. Chen, Y. C., Chen, Y. C., & Chen, J. M. (2009, February). *The influence from the dynamics of training and volunteer's characteristics on volunteer's retention in non-profit organizations*. Paper presented at The 2009 Conference on Human Resource Development and Strategy. Tainan, Taiwan. **(**Best Research Paper Award**)**