

The Impact of Self-efficacy on Innovative Work Behavior for Teachers

Hsi-Chi Hsiao, Jen-Chia Chang, Ya-Ling Tu, and Su-Chang Chen

Abstract—The purpose of this study aims to examine the impact of Self-efficacy on Innovative Work Behavior for Teachers in Taiwan. The randomly stratified sampling method is used in this study to select 546 secondary school teachers from 20 public/private schools in the northern region of Taiwan. The data is analyzed using the descriptive statistics, Pearson's correlation coefficients, and regression analysis. First, the results indicate that out of the three important ranking is at Teachers' self-efficacy, two are at "Self-efficacy towards Guiding Groups"-related, and one is at "Self-efficacy towards Using Innovations." However, the results indicate that three domains of Teachers' Self-efficacy in this study are well-performance as well as Innovative Work Behavior. The results also indicate that there is a strong positive relationship between Teachers' Self-efficacy (TSE) and Innovative Work Behavior (IWB). However, there is no statistical correlation between Self-efficacy towards using innovations and IWB's all scales. Teachers with higher self-efficacy have shown better work innovative behavior. TSE is a significant contributing factor to IWB. Several recommendations are made in the study.

Index Terms—Teachers' Self-efficacy; Innovative Work Behavior; Secondary School

I. INTRODUCTION

According to social cognitive theory defines human behavior "is mediated by our efficaciousness" and "self-efficacy beliefs influence our choices, our effort, our persistence when facing adversity, and our emotions" [1]. Teachers' self efficacy refers to "their beliefs in their ability to have a positive effect on student learning" [2]. Teachers play an important role in the success of students. Teachers' self-efficacy has been found to be associated with student motivation, teachers' adoption of innovations, teachers' competence as rated by superintendents, effective classroom management strategies of the teacher, time spent on different subjects, and teachers' referrals of students to special education [3]. Despite the perception of teachers' self-efficacy has been shown to predict teachers' goals and teachers' attitudes toward innovation and change [4].

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Hsi-Chi Hsiao, Dep. of Business Administration Cheng Shiu University Kaohsiung, Taiwan (email: hchsiao@cc.ncue.edu.tw)

Jen-Chia Chang, Institute of Technological and Vocational Education National Taipei University of Technology Taipei, Taiwan (email: jc5839@ntut.edu.tw)

Ya-Ling Tu, Dep. of Industrial Education and Technology National Changhua University of Education Changhua, Taiwan (email: d97311021@mail.ncue.edu.tw)

Su-Chang Chen, Dep. of Marketing Logistics Management National Penghu University of Science and Technology Penhu, Taiwan (email: csc@npu.edu.tw)

However, individuals with high self-efficacy are more likely to undertake more challenging activities involving more creative practices [5].

The definition of innovative work behavior can be defined as "discretionary employee actions which go beyond prescribed role expectations" [6]. Innovative behavior goes beyond creativity to include the adoption, production, and implementation of novel and useful ideas [7]. According to Kumar and Uz Kurt, their study explored the influence of self-efficacy on the innovativeness of professionals with a cultural context. Their results indicate that there is a positive relationship between self-efficacy and innovativeness among the Turkish consumers [8]. It is possible that people with a strong sense of self-efficacy can result in more creativity behavior. It might thus be argued that the concepts of self-efficacy and innovative work behavior are at least in some part related to each other.

Based on the above, this study aims to explore the status of teachers' self-efficacy and innovative work behavior for teachers. Then, understand the relationship between teachers' self-efficacy and innovative work behavior. Figure 1 illustrates the model developed for this purpose.

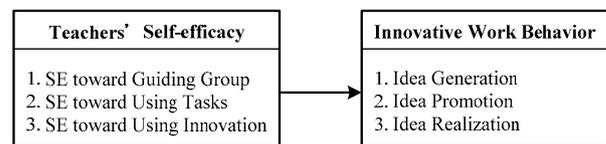


Fig. 1. The proposed model

II. LITERATURE REVIEW

A. Teachers' Self-efficacy

Perceived self-efficacy is defined as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives [9]." According to Bandura, individuals with a high sense of self-efficacy belief are more likely to have higher levels of performance and higher commitment to tolerate frustration and to remain task-focused when obstacles arise [10]. Based on social cognitive theory teachers' self-efficacy has conceptualized as individual teachers' beliefs in their own ability to plan and organize, then to carry out activities that are required to attain given educational goals [11]. A teacher with a higher perception on self-efficacy is more confident about their abilities and, therefore, more likely to stay in the teaching profession [12]. Teachers who have a high sense of self-efficacy are usually effective approaches in the classroom. When teachers have a strong positive self-efficacy, students benefit from teachers

with a high sense of self-efficacy. Teachers with strong self-efficacy beliefs seem to be more prepared to experiment with, and later also to implement new educational practices.

B. Innovative Work Behavior

Individuals' innovative behaviors in the workplace include actions such as seeking out new ideas, championing ideas at work, and securing funds/planning for the implementation of ideas [7]. According to Farr and Ford, they define innovative work behaviors as an individual's behavior to achieve the initiation and intentional introduction (within a work role, group or organization) of new and useful ideas, processes, products or procedures [13]. Previous studies have found that employees with stronger creative self-efficacy are more likely to engage in higher levels of creativity in their work [14] [15], and thus higher creative will tend to actually practice creativity when they perceive strong support from their organization [16].

III. METHOD

A. Sample

Participants in this study are randomly selected from 20 secondary schools in the north region of Taiwan. For each school, the number of female teachers exceeds that of male teachers. 64.5% of respondents were female. The final samples include 546 secondary school teachers, which accounted for 91% of the sample. Missing participants are found on questionnaires from 54 teachers. The average age of participants in the study is 35.2 years with a range of 28~52 years. The average tenure at the school is 12 years. According to respondents' self-identification, 4.4% are supervisors, 12.5% are directors, and 83.2% are general staff.

B. Procedures

In order to develop a valid and reliable questionnaire, several items are formulated based on related literature and on previous studies in this study. The questionnaire consists of two sections. The first section is about demographic information. The second section consists of 13 items concerning the Teachers' Self-efficacy Scale (TSE), and 9 items relating to the Innovative Work Behavior Scale (IWB). All scales comprised 7-point Likert-type items. The second section contains 22 items. The average time for completing each questionnaire is 25 minutes.

C. Measures

1) Teachers' Self-efficacy Scale

The Teachers' Self-efficacy Scale implemented in this study was developed by Evers, Brouwers, and Tomic [17]. The Teachers' Self-efficacy Scale consists of 3 components: Self-efficacy beliefs about guiding groups in a differentiating way, Self-efficacy beliefs about involving pupils in tasks, and Self-efficacy beliefs towards the use of innovative educational practices. All items are rated using a 7-point scale ranging from 1 (Very strongly disagree) to 7 (Very strongly agree). Sample items include "I always assess well what is going on when a group works in a troublesome way," "I am able to give the necessary clues to pupils they need in searching for relevant information for a task," and "I can

cope well with stress originating from innovative educational changes such as the Study-home." Internal consistency is measured with Cronbach's alpha ($\alpha = .86$).

2) Innovative Work Behavior Scale

The Innovative Work Behavior Scale implemented in this study is developed by Janssen [6], consisting of 9 items, each of which followed by a 7-point responses scale ranging from 1 (Very strongly disagree) to 7 (Very strongly agree). The Innovative Work Behavior (IWB) scale consists of 3 components: idea generation, idea promotion, and idea realization. Sample items included "Creating new ideas for difficult issues," "Mobilizing support for innovative idea," and "Introducing innovative ideas into the work environment in a systematic way." The original reliability of this scale is measured with Cronbach's alpha ($\alpha = .91$).

D. Data Analysis

Participants are asked to complete the questionnaire in their own time there was no set time limit. The data can be analyzed using the descriptive statistics, Pearson's correlation coefficients, and regression analysis. Considering the aims of the study, descriptive statistics are used to described and summarize the properties of the mass of data collected from respondents. Then, correlation analysis is used to find the relationship between teachers' self-efficacy and innovative work behavior. Furthermore, through the regression analysis, teachers' self-efficacy can be viewed as predictor to explain innovative work behavior of teachers.

IV. RESULTS

A. On Analysis of Descriptive Statistics of Work Self-efficacy

Table 1 illustrates the ranking of teachers' self-efficacy. The data gathered from the questionnaire indicates that "When a group is disruptive I am able to get them back to work again quickly", is the highest in importance rating scale (5.71), followed by "If pupils experience difficulties in carrying out a task, I can make them think about finding solutions themselves (5.70)," and "In general I can cope quite well with stress that attends the implementation of educational innovations, as for example the Study-home (5.69)." Out of the three important ranking are at teachers' self-efficacy, two are "Self-efficacy towards Guiding Groups"-related, and one is "Self-efficacy towards Using Innovations"

The least important ranking at teachers' self-efficacy as reported by samples are "I can find out and check whether a task has the appropriate level of difficulty (4.83)," "Even when skeptical colleagues comment on it, I am able to keep on putting my back into innovative projects (4.97)," and "I can cope well with stress originating from innovative educational changes such as the Study-home (5.09)." Out of the three least important ranking are at teacher's self-efficacy, two are "Self-efficacy towards Using Innovations"-related, and one is "Self-efficacy towards Using Tasks."

B. On analysis of Descriptive Statistics of Innovative Work Behavior

Table 1 illustrates the ranking of Innovative Work

Behavior. Among the top three most important ranking are “Acquiring approval for innovative ideas (5.59),” “Generating original solutions for problems (5.22),” and “Evaluating the utility of innovative ideas (5.06).” The least important ranking at innovative work behavior as reported by samples are “Mobilizing support for innovative ideas (4.31),” “Making important organizational members enthusiastic for innovative ideas (4.75),” and “Introducing innovative ideas into the work environment in a systematic way (4.81).”

TABLE I: RANKING OF TEACHERS’ SELF-EFFICACY

Ranking	Items	Mean	SD
Self-efficacy towards Guiding Groups			
		5.50	1.08
9	If a pupil experiences difficulties in doing a task, I am able to help him or her on the right course.	5.20	1.10
2	I always assess well what is going on when a group works in a troublesome way.	5.70	1.06
6	I am able to foster co-operation in a group when the pupils experience difficulties in this.	5.52	1.07
1	When a group is disruptive I am able to get them back to work again quickly.	5.71	1.02
7	I can quickly set a pupil to work who is thwarting co-operation with others.	5.25	1.15
5	I am able to point out to the pupils that they are responsible for good academic achievements.	5.59	1.05
Self-efficacy towards Using Tasks			
		5.21	1.18
10	If a pupil shows unmotivated behavior, I am able to find out the reason for it.	5.18	1.17
8	I am able to give the necessary clues to pupils they need in searching for relevant information for a task.	5.23	1.15
4	If pupils experience difficulties in carrying out a task, I can make them think about finding solutions themselves.	5.61	1.08
13	I can find out and check whether a task has the appropriate level of difficulty.	4.83	1.30
Self-efficacy towards Using Innovations			
		5.25	1.36
3	In general I can cope quite well with stress that attends the implementation of educational innovations, as for example the Study-home.	5.69	1.26
11	I can cope well with stress originating from innovative educational changes such as the Study-home.	5.09	1.41
12	Even when skeptical colleagues comment on it, I am able to keep on putting my back into innovative projects.	4.97	1.40

N=546

TABLE II: RANKING OF INNOVATIVE WORK BEHAVIOR

Ranking	Items	Mean	SD
Idea Generation			
		5.03	1.10
6	Creating new ideas for difficult issues.	4.91	1.06
5	Searching out new working methods techniques or instruments.	4.96	1.14
2	Generating original solutions for problems.	5.22	1.11
Idea Promotion			
		4.88	1.19
9	Mobilizing support for innovative ideas	4.31	1.24
1	Acquiring approval for innovative ideas.	5.59	1.06
8	Making important organizational members enthusiastic for innovative ideas.	4.75	1.28
Idea Realization			
		4.95	1.17
4	Transforming innovative ideas into useful applications.	4.99	1.16
7	Introducing innovative ideas into the work environment in a systematic way.	4.81	1.20
3	Evaluating the utility of innovative ideas.	5.06	1.16

N=546

C. The Relationship between Teachers’ Self-efficacy and Innovative Work Behavior

The Pearson’s correlation coefficients among the questionnaire scales are presented in Table 3. The relationships between the Teachers’ Self-efficacy and Innovative Work Behavior indicate that all of the variables

are significantly positively correlated with each other ($r > .5$, $p < .01$), except that no statistical correlation is found between Self-efficacy towards Using Innovations and all scales. Self-efficacy towards Guiding Groups has significant and positive correlation with Self-efficacy towards Using Tasks ($r = .73$, $p < .01$), Idea Generation ($r = .57$, $p < .01$), Idea Promotion ($r = .54$, $p < .01$), and Idea Realization ($r = .56$, $p < .01$). Self-efficacy towards Using Tasks has significant and positive correlation with Idea Generation ($r = .60$, $p < .01$), Idea Promotion ($r = .58$, $p < .01$), and Idea Realization ($r = .65$, $p < .01$). Idea Generation has significant and strong correlation with Idea Promotion ($r = .59$, $p < .01$) and Idea Realization ($r = .72$, $p < .01$). Idea Promotion has significant and positive relationship with Idea Realization ($r = .68$, $p < .01$). Teachers with high a self-efficacy have shown better work innovative behavior. These variables indicate that many of the variables significantly correlated with each other but are all less than .73 (see Table 3). Unfortunately, the SE towards Using Innovations of TSE, there are no significant relationship with all scales of innovative work behavior.

D. Regression Analysis

In Model 1, this study use Self-efficacy towards Guiding Groups, Self-efficacy towards Using Tasks, and Self-efficacy towards Using Innovations as three independent variables into the regression equation. The results reveal that these two variables are the significant predictors in explaining 63.1% on Idea Generation. In addition, the Model 2 reveals that three independent variables are the significant predictor in explaining 36.1% on Idea Promotion. Furthermore, Model 3 reveals that three independent variables are the significant predictor in explaining 43.8% on Idea Realization. These results imply that Self-efficacy towards Guiding Groups, Self-efficacy towards Using Tasks, and Self-efficacy towards Using Innovations are e significant predictor variables on Idea Generation, Idea Promotion, and Idea Realization respectively.

TABLE III: CORRELATION ANALYSIS BETWEEN TSE AND IWB

	M	SD	1	2	3	4	5
1. SE towards Guiding Groups	4.70	.74	—				
2. SE towards Using Tasks	2.99	.53	.73**	—			
3. SE towards Using Innovations	2.25	.51	.07	.05	—		
4. Idea Generation	2.16	.42	.57**	.60**	.06	—	
5. Idea Promotion	2.09	.41	.54**	.58**	-.01	.59**	—
6. Idea Realization	2.12	.45	.56**	.65**	.08	.72**	.68**

n=546, ** $p < .01$

In the total score of teachers’ self-efficacy, Model 1 indicates that teachers’ self-efficacy is the significant predictor variables explaining 33.9% of variance on Idea Generation. Then, the result of Model 2 reveals that teachers’ self-efficacy is a significant predictor, explaining 27.7% of variation on Idea Promotion. Furthermore, Model 3 shows that teachers’ self-efficacy is a significant predictor in explaining 35.3% of variance on Idea Realization. These results reveal that teachers’ self-efficacy is significant predictor variables on Idea Generation, Idea Promotion, and Idea Realization respectively (see Table 4).

TABLE VI: REGRESSION ANALYSIS OF THREE SUBSCALES AT TEACHERS' SELF-EFFICACY ON INNOVATIVE WORK BEHAVIOR

Independent Variable	Model 1 (Idea Generation)			Model 2 (Idea Promotion)			Model 3 (Idea Realization)		
	B	SE	β	B	SE	β	B	SE	β
SE towards Guiding Groups	.159	.028	.278**	.140	.028	.251**	.109	.028	.181**
SE towards Using Tasks	.317	.039	.398**	.307	.039	.394**	.435	.040	.518**
SE towards Using Innovations	.014	.028	.017	-.040	.028	-.049	.009	.028	.010
R ²	.631			.361			.438		
F	119.720**			102.094**			141.033**		
Teachers' Self-efficacy	.183	.011	.583**	.165	.011	.526**	.201	.012	.594**
R ²	.339			.277			.353		
F	279.547**			208.216**			296.551**		

n=546, **p<.01

V. DISCUSSION

The purpose of this study is to investigate the impact of teachers' self-efficacy on innovative work behavior. First, the result reveals that of the three most important factors on teachers' self-efficacy, two are related to "self-efficacy towards guiding groups" and one is "self-efficacy towards using innovations." The second purpose in studying teachers' self-efficacy is guiding groups of pupils in different ways. According to Meijnen [18], a teacher might become the group manager, whose main focus is to associate well and efficiently with groups of pupils. However, the result indicates that the three most important factors regarding innovative work behavior were "idea generation", "idea promotion", and "idea realization". Three domains of teachers' self-efficacy in this study were good performance as well as innovative work behavior. This result concurs with Jassen's [6] innovative work behavior. The most common innovative work behavior is "idea generation", followed by "idea promotion," and "idea realization." Teachers usually have good ideas, but they still need to discuss with their peers or supervisors, and they even attempt to convince each other. Once in a while, when the teachers' new idea is adopted, the realization of an innovative idea has begun. As a result, it may help teachers create higher innovative work behavior step by step.

The second result reveals that there is a significantly positive relationship between teachers' self-efficacy and innovative work behavior, except that no statistical correlation is found between self-efficacy towards using innovations and all scales. This result concurs with Gibbs [19], whose study indicates when teachers' self-efficacy was enhanced, and then their persistence, resilience and willingness in expecting to engage in innovative practices also increased. Several studies indicate that stronger positive self-efficacy results in students gaining more academic achievement increased their students' motivation and improvements to students' self-efficacy [20] [21]. Therefore, teachers with high self-efficacy are found to be more innovative in teaching.

Furthermore, regression analyses reveal that the total score on teachers' self-efficacy is a good predictor on innovative work behavior of three subscales relating to idea generation idea promotion, and idea realization. Teachers' self-efficacy has a strong and positive influence on work innovative

behavior. However, this result also has demonstrated that "Teacher Self-efficacy towards Using Tasks" is a better predictor among the participants. This result concurs with Allinder [22] whose study has found that teachers with strong self-efficacy beliefs are seen to be more prepared to experiment, and later to implement new educational practices.

In addition, in model 1, "teacher self-efficacy towards guiding group and using tasks" are two important predictors on Idea Generation. This result reveals that through the group building and teamwork can enhance the idea generation. In model 2, "teacher self-efficacy towards guiding group and using tasks" are two important predictors to Idea Promotion. This result also indicates that teachers involved in their students in their tasks and discussion may promote more effective ideas. In model 3, "teacher self-efficacy towards guiding group and using tasks" are two important predictors to Idea Realization. This result shows that teachers want to implement the innovation, but they may not have the idea of realization. It doesn't matter, in the total score of Teacher Self-efficacy; it was shown that teacher self-efficacy is still an important predictor for teachers' innovative work behavior.

According to the theory of innovative behavior by Jassen [6], teachers usually get involved in the innovative idea generation at first, and then embed the promotion of innovation ideas. Finally, a clearly defined mission will foster the realization of innovative ideas. This is an evolutionary and gradual process. Model 1 found that teachers applying innovative self-efficacy cannot predict the behavior of teachers. In other words, teachers should be encouraged to use strategies to build self-efficacy in various ways. Teachers can go through more team building methods or challenging tasks assigned by them. Then, they have the opportunity to create more innovative work behavior. Moreover, schools have to avoid too much work pressure on teachers. Teachers should avoid asking themselves to believe that they can use the innovation more successfully in their teaching. This result concurs with Jassen [6] whose study found that the generation of innovative work behavior is through the belief of self-efficacy. The establishment of self-efficacy on teachers is a gradual process.

VI. CONCLUSIONS

The most important ranking at Teachers' Self-efficacy as reported by sample is "When a group is disruptive I am able to get them back to work again quickly". The least important ranking at Teachers' Self-efficacy as reported by sample is "I can find out and check whether a task has the appropriate level of difficulty. Studies have shown that teachers in high self-efficacy adopted more effective strategies to improve the quality of teaching. In contrast, those teachers have a low level of self-efficacy preferred more restrictive strategies, such as referring the pupil for treatment outside the general classroom (Brophy & McCaslin, 1992; Jordan, Kircaali-Iftar & Diamond, 1993). In fact, teacher self-efficacy is related to a more democratic classroom style and teaching practices (Solomon, Watson, & Battistich, 2002). In order to help

teachers acquire more self-efficacy, it is important to work with them and help them to increase teachers' awareness of the importance of helpful approaches.

The most important ranking of Innovative Work Behavior is "Acquiring approval for innovative ideas." The least important ranking at Innovative Work Behavior as reported by samples are "Mobilizing support for innovative ideas." Past studies have indicated that teachers higher on innovative work behaviors show more innovative output. The study also showed that Innovative Work Behavior is a complex process that requires the collaboration of many teachers. To foster innovative work behavior, teachers must be encouraged to actively seek opportunities for improvement and change.

This study has highlighted the importance of Teachers' Self-efficacy and Innovative Work Behavior. In all, the study helped to improve the understanding of how and why teachers develop self-efficacy to promote innovations at work. This study has provided important insights into teachers' self-efficacy which could be utilized to raise teachers' innovative behavior at the workplace. Teachers with higher self-efficacy exhibit higher levels of innovative behavior at their workplaces. In order to increase the innovative work behavior for teachers, it is the best way to build teachers' self-efficacy. With regard to the directions for future researches, this study investigated the relationship of teachers' self-efficacy and innovative work behavior. According to the factors mentioned above, there are other factors that may influence their innovative behavior. Then, it is worth exploring them in the future.

VII. IMPLICATIONS & LIMITATIONS

This study has implications for teachers regarding their teaching and research. The results indicate that teachers' self-efficacy has a positive influence on innovative work behavior. Although the prior research has shown that teacher self-efficacy is related to innovative work behaviors that improve student outcomes in the classroom. In other words, teachers with a high sense of instructional self-efficacy spend more time planning and organizing classroom activities [23]. Thus, students benefit from having teachers with high level of self-efficacy. Teachers can use strategies to build self-efficacy in various ways. Teachers can boost their self-efficacy with successful experience. A positive mood can promote their beliefs in self-efficacy, while anxiety can be undermined [24]. Fostering change in personal self-efficacy is a challenge generally [1] [25].

The practical results of this study imply that school principals have to promote teachers' innovative work behavior, and then teachers' self-efficacy is increased through encouragement and praise. Principals also offer a reward for successful and innovative teachers. This study has several limitations that may be answered by future research. First, our samples were small and homogeneous. This study collected data from 546 teachers in the Taiwanese sample. Larger and more diverse samples would verify the generalizability. Second, the measures need further validation, in terms of using samples from different educational levels. In addition, future studies could also use qualitative methods to understand the mental process of

teachers.

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Professor Hsi-Chi Hsiao received his M.S. degree from University of Wisconsin in 1983 and Ph. D. from Indiana State University in 1987. He was head of Department of Industrial Education at National Changhua University of Education and president of National Penghu Institute of Technology in Taiwan. He has also served as government consultant in the field of curriculum and instruction, vocational and technological education, research in applied science education for many years. He is now a chair professor at Graduate Institute of Business and Administration, Cheng Shiu University. His research interest has been focused on curriculum and instruction development, skill testing and creativity for vocational, technological and engineering education.

Jen-Chia Chang, Dr., gained a MA in Industrial Education in 1994 from National Changhua University of Education, and a PhD in Industrial Education in 1999 from National Changhua University of Education.

Currently, he is an associate professor in Institute of Vocational and Technological Education, National Taipei University of Technology in Taiwan and related subjects has been taught in human resource management of engineering education. Dr. Jen-Chia Chang has taught eleven years at industrial vocational high school and eight years at university of technology. Jen-Chia Chang is also a member of some professional organizations, like as ASEE, IACSIT, DACC, CVIEA, et al. He has authored more than 100 articles and papers, and his work had published in Australia, U.S., China, Taiwan, and other countries. His research interesting has focused on engineering education, and innovative management.

Ya-Ling Tu is a doctoral student at the Department of Industrial Education and Technology, National Changhua University of Education (NCUE) in Taiwan. She has published more than 15 articles and papers on subjects ranging from information and communications technology (ICT), organizational behavior, innovation strategy and management. She is also a project-appointed research assistant. She has participated in many other research projects.

Su-Chang Chen, Dr., is an associate professor at the department of Marketing and Logistics Management in National Penghu University of Science and Technology. He received MBA degree from institute of Management Science in National Chia-Tung University in 1972 and Ph. D. degree from the department of Industrial Education in National Changhua University of Education in 1999. His research interests include vocational and technological education, human resource management, and business administration.