

Investigating the Relationship Between the School Principal's Leadership Behavior and Teachers' Innovative Behavior: The Mediating Role of Work Engagement

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Abstract

This study aims to explore the impact of the school principal's leadership behavior on the teachers' innovative behavior, and the mediating effect of work engagement. A total of 510 questionnaires were distributed among elementary school teachers in Changhua County, Taiwan, of which 466 were valid. The effective response rate reached 91.37%. The results showed that vision building within the school's principal leadership behavior, and vigor and absorption within work engagement significantly influenced teachers' innovative behavior. Further, it was found that work engagement partially mediated the relationship between the school principal's leadership behavior and the teachers' innovative behavior. Finally, several suggestions were provided for the school principal and teachers of elementary schools.

Keywords: Leadership Behavior, Principal, Teachers' Innovative Behavior, Work Engagement.

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1. Introduction

The 21st century is the era of knowledge economy, with its focal points being innovation and talent cultivation (Fang, 2001). The importance of education becomes apparent in nurturing talent, while innovation emerges as a prerequisite for survival in a constantly evolving global environment. To establish a country centered on the knowledge economy, the educational system must be cultivated since both the innovation of knowledge and the collaboration of human resources rely heavily on it (Shiao et al., 2009). Since the 1990s, Taiwan has initiated educational reform measures centered on innovation, action, and transcendence, promoting innovative educational initiatives. The crucial factor for the successful implementation of educational reforms lies in the school principals' leadership behavior (Jang, 2006). In the 2013 Talent Cultivation White Paper by the Taiwanese Ministry of Education, enhancing the leadership effectiveness of school principals was one of the strategies to improve education. A principal who inspires teachers' enthusiasm, acts as a guiding force in creating a conducive teaching environment, and demonstrates a professional work attitude will stimulate more innovative behaviors among teachers (Hsieh, 2014; Liu and Zaman, 2025). Most countries are currently facing worldwide challenges such as declining birth rates, aging populations, globalization, digitization, and global warming. Hence, it is evident that principals must adopt varied leadership strategies based on distinct school contexts. The educational philosophy and leadership behaviors of principals can wield a significant impact on the success or failure of educational endeavors within a school. Does the current state of principal leadership align with the prevailing trends in educational reform? This constitutes one of the motivations for this study. Teachers are tasked with the transmission, analysis, and generation of knowledge. In this era of rapid change, the ability to innovate is an indispensable skill for teachers to properly guide students to confront future challenges. A study by Wu (2012) showed that the higher the level of innovative teaching exhibited by teachers, the more efficacious the instructional outcomes. With recent relaxation in Taiwan's educational policies, endorsing teachers in undertaking curriculum research and fostering innovation has become paramount. Emphasis is placed on infusing creativity into teaching, offering flexible and diverse learning curricula to facilitate students' adaptive development and enhance learning effectiveness. Consequently, teachers' innovation has emerged as a novel trend in education. Understanding the current state of innovative behavior among teachers is the second motivation for this research.

The success of organizations stems from employees' willingness to engage actively, infusing their work with enthusiasm. At present, the concept of engagement is gradually gaining prominence. When employees exhibit a higher level of engagement, job performance is expected to improve. How can employees be spurred to have engagement?

According to the related research, appropriately defined leadership behaviors by supervisors can enhance employees' engagement (May et al., 2004). Bakker and

Schaufeli (2008) found that employees with engagement tend to display active dedication and positive interactions with others in the workplace, facilitating the stimulation of individual innovative behavior (Zhang and Bartol, 2010). Hence, within the educational setting, when the principal manages to elicit teacher engagement, it empowers them to demonstrate their professional competence, actively participate in teaching, foster innovative thinking and behavior, and ultimately augment instructional effectiveness. This current study posits that engagement may mediate between the school principal's leadership behavior and the teachers' innovative behavior. We believe that exploring how the principal can enhance teachers' engagement, subsequently fostering their innovative behavior, is a worthwhile topic for investigation. This constitutes the third motivation for the study.

In recent years, research about engagement, leadership, and innovation in Taiwan has predominantly concentrated on the private sector or government agencies, with limited exploration within the field of education. In the current educational reform landscape, principals and teachers play pivotal roles. School principals' leadership behavior and teachers' proactive innovation can significantly enhance school performance. Therefore, understanding the relationship between the school principal's leadership behavior, and teachers' engagement and innovative behavior is essential. Consequently, this study recruited elementary school teachers as participants. The relevant research objectives encompass gaining insights into the impact of elementary school principals' leadership behavior on teacher engagement and innovative behavior. Furthermore, the study explores whether teacher engagement mediates between elementary school principal's leadership behavior and teachers' innovative behavior.

2. Literature Review

2.1 School Principal's Leadership Behavior

"Leadership" entails guiding and directing members towards a common goal. The concept of leadership has continuously evolved with the societal changes over time. The emergence of transformational leadership is commonly attributed to the inability of previous schools of thought to address the proactive role of leaders in organizational innovation and in overlooking the potential for self-growth among organizational members. Transformational leadership focuses on the leader's vision, empowerment, and motivational strategies for the members it governs. It posits that leaders are responsible for guiding the organization toward innovation, aligning more with the pulsations of the contemporary era (Zhang, 2020; Tsai, 2020; Chi, 2008; Shen, 2016).

Transformational leadership involves leaders utilizing personal charisma to establish a vision for developing organizational goals in collaboration with their members. Through various motivational strategies, it aims to enhance members' autonomy. Transformational leadership places emphasis on nurturing human nature and fostering self-awareness, thereby enabling organizational members to actively

engage in decision-making, delegate authority and responsibilities, and cultivate a culture of continuous learning and personal development. In the educational context, transformational leadership by a school principal entails the ability to leverage leadership charisma, earnestly motivate the morale of the school community members, enhance teachers' work motivation, and encourage them to invest effort willingly, all toward the collective achievement of the school's developmental objectives (Chen, 2004; Su, 2007; Hung, 2011).

The present study, taking into account the current situation of elementary schools and integrating relevant literature, categorizes the school principal's leadership behavior into four dimensions namely: (1) vision building, (2) individual care, (3) intellectual stimulation, and (4) inspiration and encouragement (Bass and Avolio, 1990; Lin, 1995; Jantzi and Leithwood, 1996; Tseng, 2000; Pu, 2003; Chin and Wu, 2009; Cheng and Cheng, 2014). Vision building refers to the school principal's ability to analyze the school's characteristics, assess its strengths and weaknesses, foresee its future development, and collaboratively discuss and formulate a school vision with the teachers. Individual care entails the school principal demonstrating the capability to address individual differences and needs among teachers, providing them with assistance, helping solve the problems being faced, caring about teachers' personal issues, listening to their concerns, and advocating for their welfare and rights. Intellectual stimulation involves the school principal creating an environment with an open mindset, encouraging teachers to proactively engage in critical thinking and utilize innovative thinking to solve problems. The principal willingly imparts experiences, embraces new knowledge, continuously seeks personal growth, promotes a culture of learning, and encourages teachers to share successful experiences for collective growth. Inspiration and encouragement imply that the school principal employs various motivational methods to guide teachers, expressing confidence and reasonable expectations toward them. This enhances teachers' enthusiasm for work, enabling them to unleash their strengths and collectively strive towards common goals.

2.2 Work Engagement

The term "engagement" was originally proposed by Kahn (1990), who viewed dedication as the connection between psychological and task-related environments, focusing on individuals' self-investment in their work. Lin (2008) found that subordinates with high engagement are more willing to stay and wholeheartedly commit to the organization. Chang (2016) suggested that individuals with engagement can positively and actively achieve goals in their work, experience self-fulfillment, and possess three psychological states: vitality, dedication, and enthusiasm. Liang et al. (2021) defined engagement as employees fully integrating themselves into their roles, leading to their involvement, satisfaction, and love for their work. Concurrently, the phenomenon generates psychological states, including vigor, dedication, and absorption, which serve as motivational factors (Schaufeli et al., 2006; Schaufeli et al., 2002). After reviewing the literature, it was observed that many scholars commonly utilize the UWES (Utrecht Work Engagement Scale)

developed by Schaufeli et al. (2002) to measure engagement. It has three dimensions namely: (1) vigor, (2) dedication, and (3) absorption. Vigor refers to having abundant energy during work, willingness to invest effort, ability to persist in the face of difficulties or problems, and not easily feeling tired. Dedication indicates an individual's enthusiasm and self-confidence in their work. It involves recognizing the importance and meaning of the work they do and being willing to devote oneself wholeheartedly. Lastly, absorption describes an individual who finds joy in their work, who feels that time passes quickly at work because of the enjoyment it brings, and who is not easily affected by external factors.

2.3 Teacher's Innovative Behavior

Liang et al. (2021) study underscored the heightened scrutiny of innovative behavior among the myriad work behaviors exhibited by employees. This emphasis arises from the pivotal role that employees' innovative behavior plays in organizational effectiveness and competitive advantage, with a significant impact on the organization's long-term development (Pieterse et al., 2010). Furthermore, within the landscape of rapidly evolving industries, innovative behavior stands as a crucial indicator for measuring employees' job performance (Wang et al., 2015). In the school environment, according to Sung (2021), school innovation is an internally planned reform activity that encompasses the enhancement of internal conditions, the elevation of adaptability to environmental changes, and the sustenance of perpetual progress and development within the school. This process aims to achieve the school's educational objectives and can be approached from administrative operations, curriculum instruction, and student learning. Li et al. (2025) mentioned that teachers' innovative behavior refers to the process through which teachers intentionally generate, promote, and implement novel ideas, instructional strategies, or pedagogical practices within educational contexts in order to improve teaching effectiveness and student learning outcomes. Previous research on teacher innovation has predominantly focused on the instructional and classroom management aspects (Wu, 2005; Ma, 2007; Cheng, 2008; Lin, 2010; Wu, 2014; Lin, 2016), with less emphasis on the counseling and disciplinary dimensions. Synthesizing the above, this study categorized teacher responsibilities into three significant facets and explored innovative behavior within them. This includes (1) instruction, (2) classroom management, and (3) counseling.

Instruction innovation refers to teachers' ability to adjust and update teaching methods during instructional activities to evoke student learning motivation, adapt to individual differences, and achieve innovative behavior aligned with the teaching objectives (Huang, 2010; Tsai, 2012; Huang, 2013). Meanwhile, classroom management innovation signifies the teachers' capacity to effectively handle various matters related to the classroom to create a favorable environment to consequently achieve innovative behavior in support of the educational objectives (Yang, 2010; Chuang, 2013). Finally, counseling innovation indicates teachers' ability to innovate in counseling and disciplinary behaviors which includes safeguarding students' learning rights, educational rights, autonomy, and

personality development, as well as maintaining campus safety and teaching order (Lin, 2011).

2.4 Derivation of Hypotheses

Liao's (2012) study found a correlation between a school principal's transformational leadership and innovative teaching behavior. Yeh's (2012) research indicated that specific dimensions of transformational leadership by high school principals in Taipei significantly predicted some aspects of innovative work behavior. Norouzinik et al. (2022) stated that organizations need innovation in products and services to grow and survive in competitive environments. Employees' innovative behavior is influenced by various factors, including leadership styles and leaders' characteristics. In summary, this study posits the following hypotheses:

Hypothesis 1 (H1): The school principal's leadership behavior significantly influences teachers' innovative behavior.

H1-1: Vision building within the school principal's leadership behavior significantly influences the teachers' innovative behavior.

H1-2: Individual care within the school principal's leadership behavior significantly influences the teachers' innovative behavior.

H1-3: Intellectual stimulation within the school principal's leadership behavior significantly influences the teachers' innovative behavior.

H1-4: Inspiration and encouragement within the school principal's leadership behavior significantly influence the teachers' innovative behavior.

Combining insights from relevant research on transformational leadership and engagement, it was found that transformative leaders employ various methods to motivate and care for their subordinates' physical and mental well-being. This cultivates a willingness among subordinates to invest in their work, recognize the importance of tasks, dedicate themselves to their work, and focus on their responsibilities. Subordinates' growth, job satisfaction, and morale are all influenced by the leadership behavior of their supervisors (Chang, 2011; Lin, 2014; Lu, 2015). Lin (2008) pointed out that different leadership styles significantly and positively impact subordinates' engagement, with transformational leadership exerting a more significant influence than transactional leadership. Yeh (2016), focusing on grassroots employees in enterprises, found a positive correlation between transformational leadership and engagement. Additionally, leadership styles and school leadership traits have been shown to significantly influence teachers' work engagement (Jaafar et al., 2025). Based on these, the present study proposes the following hypotheses:

Hypothesis 2(H2): The school principal's leadership behavior significantly influences work engagement.

H2-1: Vision building within the school principal's leadership behavior significantly influences work engagement.

H2-2: Individual care within the school principal's leadership behavior significantly influences work engagement.

H2-3: Intellectual stimulation within the school principal's leadership behavior significantly influences work engagement.

H2-4: Inspiration and encouragement within the school principal's leadership behavior significantly influence work engagement.

Tseng (2013) surveyed the marketing, research and development, and information departments of manufacturing and service industries, and observed that engagement positively influenced innovative behavior. Ke (2015) studied employees in the research and development departments of the high-tech industry, and the results revealed a positive relationship between engagement and employee innovative behavior. Liang et al. (2021) mentioned that numerous studies have confirmed that engagement is a precursor to proactive behaviors such as innovation (Bakker et al., 2020; Orth and Volmer, 2017; Schmitt et al., 2016). Therefore, this study proposes the following hypotheses:

Hypothesis 3 (H3): Work engagement significantly influences teachers' innovative behavior.

H3-1: Vigor within work engagement significantly influences teachers' innovative behavior.

H3-2: Dedication within work engagement significantly influences teachers' innovative behavior.

H3-3: Absorption within work engagement significantly influences teachers' innovative behavior.

Kwon and Kim (2020) used the JD-R model to provide a comprehensive understanding of the relationship between employee engagement and innovative behavior. Through this work, they were able to determine whether a certain leadership style could affect innovation behavior and whether employee engagement is a mediator. The study of Norouzinik et al. (2022) analyzed the effect of narcissistic leadership on employees' innovative behavior by introducing employees' job embeddedness and job engagement as the mediating variables. Hsieh and Chang (2020) indicated that principal instructional leadership, through teachers' work engagement, influences teaching innovation, with teacher work engagement as an explanatory mediating effect. Therefore, this study proposes the following hypothesis:

Hypothesis 4 (H4): Work engagement serves as a mediating variable between the school principal's leadership behavior and the teachers' innovative behavior.

3. Research Method and Analysis

The research structure is presented in Figure 1. The independent variable is the school principal's leadership behavior, the dependent variable is the teachers' innovative behavior, and the mediating variable is work engagement.

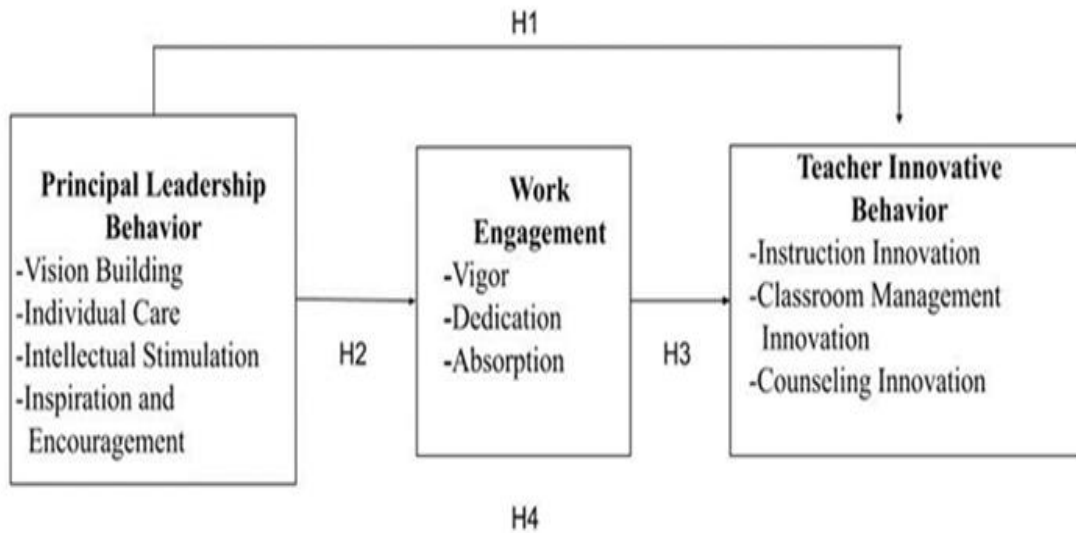


Figure 1: Research Structure

3.1 Research Tools

3.1.1 Questionnaire Sample

This study recruited public elementary school teachers in Changhua County, Taiwan as participants. The total population is comprised of 175 schools with a combined total of 5,042 teachers. The research employed a questionnaire as the data collection tool. Initially, the population was stratified into three categories based on class size: below 12 classes, 13 to 24 classes, and 25 and above classes. Subsequently, questionnaires were distributed according to the percentage distribution of the population within each size category.

3.1.2 Pre-test Questionnaire Sampling

Following the sampling principles proposed by Wu (2013), this study determined the pre-test sample size by taking 3 to 5 times the number of items in the scale with the most questions. Since the scale with the highest number of questions in this study is the Teachers' Innovative Behavior scale with 23 items, it was anticipated that 115 responses would be collected. Considering the 80% potential response rate, a pre-test sample size of 150 was chosen (Table 1).

A total of 150 pre-test questionnaires were distributed in this study, with 144 returned. Out of the returned questionnaires, 140 were deemed valid, resulting in an effective response rate of 93.3%. The details of the returns are summarized in Table 2.

Table 1: Pre-test Questionnaire Sampling Ratios

Item	School scale			Total
	Up to 12 classes	13-24 classes	25 classes and above	
Number of schools	108	31	36	175
Number of teachers	1469	1012	2561	5042
Teacher ratio	29.14%	20.07%	50.79%	100
Required questionnaires	40	32	78	150
Pre-test sampled schools	5	2	3	10
Pre-test sampled individuals per school	8	16	26	

Table 2: Pre-Test Questionnaire Distribution and Returns

School size	Number of distributed questionnaires	Number of retrieved questionnaires	Number of valid questionnaires	Valid return rate
Up to 12 classes	40	39	38	95.0%
13-24 classes	32	30	28	87.5%
25 classes and above	78	75	74	94.9%
Total	150	144	140	93.3%

3.1.3 Formal Questionnaire Sampling

To calculate the sample size, Wu's (2013) formula for sample size determination was adopted as shown by Equation 1: where N represents the population, which corresponds to the number of teachers in public elementary schools in Changhua County, Taiwan (N=5042). Setting p to 0.5 provides the most conservative estimate for the sample size. Typically, a significance level of α is 0.05 with a confidence coefficient of 0.95, corresponding to a significance level constant $k=1.96$ and $p=0.5$, resulting in an optimal sample size of 357. Considering a 70% response rate, this study determined that the questionnaire sample size must be 510 (Table 3).

$$n \geq \frac{N}{\left(\frac{\alpha}{k}\right)^2 \frac{N-1}{p(1-p)} + 1} \tag{1}$$

This study targeted elementary school teachers in Changhua County as the population, employing stratified sampling based on school size. A total of 510 questionnaires were distributed, with 473 returned and 466 deemed valid. The details of the returns are outlined in Table 4.

Table 3: Formal Questionnaire Sampling Ratio

Item	School scale			
	Up to 12 classes	13-24 classes	25 classes and above	Total
Number of schools	108	31	36	175
Number of teachers	1469	1012	2561	5042
Teacher ratio	29.14%	20.07%	50.79%	100%
Required questionnaires	149	102	259	510
Sampled schools	16	6	10	32
Sampled individuals per school	8-10	16-18	25-27	

Table 4: Formal Questionnaire Distribution and Returns

School size	Number of distributed questionnaires	Number of retrieved questionnaires	Number of valid questionnaires	Valid return rate
Up to 12 classes	149	141	140	93.96%
13-24 classes	102	96	96	94.12%
25 classes and above	259	236	230	88.80%
Total	510	473	466	91.37%

3.2 Questionnaire Design

The research questionnaire employed a four-point Likert scale to allow participants to express their level of agreement with the items, with 1 for “Strongly Disagree”, 2 for “Disagree”, 3 for “Agree”, and to 4 for “Strongly Agree”.

3.2.1 Principal's Leadership Behavior Scale

The principal leadership behavior scale utilized in this study was adapted from those developed by Hung (2011), Chen (2014), Hsu (2015), and Chen (2015). The questionnaire, comprising 20 items with no reverse-coded questions, is a modified compilation of these sources. It encompasses four dimensions: “Vision Building”, “Individual Care”, “Intellectual Stimulation”, and “Inspiration and Encouragement”.

3.2.2 Work Engagement Scale

This scale was developed based on the UWES simplified version with 9 items (Schaufeli et al., 2002). It also drew inspiration from the research of Chang (2011), Wang (2015), and Chan (2016). The scale consisted of 13 items, categorized into three dimensions: “Vigor”, “Dedication”, and “Absorption”, with no reverse-coded questions.

3.2.3 Teachers' Innovative Behavior Scale

This scale was based on the studies by Chin (2009), Ni (2012), Wu (2014), Chen (2015), Yen (2015), and Hsu (2015). It was further adapted and refined according to the current educational context. The scale comprises 23 items, without reverse-coded questions, and is divided into three dimensions: “Instruction Innovation”, “Class Management Innovation”, and “Counseling Innovation”.

3.3 Expert Scholar Review for Content Validity

In order to ensure the appropriateness and representativeness of the research instruments, feedback on content validity assessment was sought from experts and scholars in the field of education following the development of each questionnaire scale. The names of the five expert scholars involved are listed in Table 5.

Table 5: List of Experts for Reviewing Content Validity

Code	Current Position
A	University Professor
B	Elementary School Principal
C	Elementary School Director
D	Elementary School Senior Teacher
E	Elementary School Senior Teacher

3.4 Item Analysis and Reliability Analysis

In item analysis, discriminant value testing and correlation analysis were utilized to identify items with strong discriminative power. Items that exhibited a discriminant value (t-value) exceeding 1.96 and demonstrated significant differences at a significance level of 0.05 were deemed effective in distinguishing between high and low-scoring groups and were consequently retained. Items exhibiting a correlation coefficient with the scale's total score of 0.30 or above and achieving a significance level of 0.01 were considered relevant and retained. The analysis results indicated that all items can be retained.

To assess the internal consistency and stability of each dimension, Cronbach's α coefficient was utilized in reliability analysis. As suggested by Wu (2013), α values above 0.70 are considered desirable at the factor level, while exceeding 0.80 is preferable for the overall scale to ensure its appropriateness. As presented in Table 6, the analysis results indicated that the α values for all three scales were above 0.757, demonstrating good internal consistency.

Table 6: Results of Reliability Analysis

Dimension	Cronbach α Value	Total Scale α Value
Principal's Leadership Behavior		
Vision Building	.862	.959
Individual Care	.917	
Intellectual Stimulation	.872	
Inspiration and Encouragement	.865	
Work Engagement		
Vigor	.757	.917
Dedication	.851	
Absorption	.857	
Teachers' Innovative Behavior		
Instruction Innovation	.898	.942
Class Management Innovation	.846	
Counseling Innovation	.829	

3.5 Correlation Analysis

After dealing with the data from formal questionnaires, Table 7 shows that the correlation coefficients between the school principal's leadership behavior and work engagement were positive and significant. Notably, the school principal's leadership behavior total scale correlated highest with "vigor" ($r = 0.369$, $p < 0.001$).

Table 7: School Principal's Leadership Behavior and Work Engagement Correlation Analysis

		Work Engagement			
		Vigor	Dedication	Absorption	Total Scale
School Principal's Leadership Behavior	Vision Building	.350***	.327***	.281***	.359***
	Individual Care	.325***	.213***	.211***	.274***
	Intellectual Stimulation	.344***	.293***	.298***	.348***
	Inspiration and Encouragement	.339***	.310***	.314***	.360***
	Total Scale	.369***	.308***	.298***	.363***

***p<.001; **p<.01; *p<.05

As presented in Table 8, the correlation coefficients between the school principal's leadership behavior and teachers' innovative behavior indicated that they have a positive and significant relationship. Notably, the "vision building" dimension had the highest correlation with teachers' innovative behavior total scale ($r = 0.328$, $p < 0.001$).

Table 8: The School Principal's Leadership Behavior and Teachers' Innovative Behavior Correlation Analysis

		Teachers' Innovative Behavior			
		Instruction Innovation	Class Management Innovation	Counseling Innovation	Total Scale
School Principal's Leadership Behavior	Vision Building	.301***	.266***	.289***	.328***
	Individual Care	.176***	.205***	.209***	.224***
	Intellectual Stimulation	.288***	.235***	.275***	.306***
	Inspiration and Encouragement	.259***	.216***	.230***	.271***
	Total Scale	.274***	.249***	.270***	.304***

***p<.001; **p<.01; *p<.05

As can be observed in Table 9, the correlation coefficients between work engagement and teachers' innovative behavior indicated that they have a positive and significant relationship. The work engagement total scale exhibited the highest correlation with the teachers' innovative behavior total scale ($r = 0.523$, $p < 0.001$).

Table 9: Work Engagement and Teachers' Innovative Behavior Correlation Analysis

		Teachers' Innovative Behavior			
		Instruction Innovation	Class Management Innovation	Counseling Innovation	Total Scale
Work Engagement	Vigor	.429***	.376***	.451***	.479***
	Dedication	.441***	.327***	.353***	.434***
	Absorption	.474***	.385***	.408***	.489***
	Total Scale	.505***	.405***	.448***	.523***

*** $p < .001$; ** $p < .01$; * $p < .05$

3.6 Regression Analysis

This study observed significant differences in the school principal's leadership behavior, work engagement, and teachers' innovative behavior among various job positions within the teacher background variables. Therefore, with job position as a control variable, several regression analyses were conducted to examine the relationships among the school principal's leadership behavior, work engagement, and teachers' innovative behavior.

In Table 10, it can be seen that the F-values were significant; for the "vision building" dimension of the school principal's leadership behavior, the β values for its impact on instruction innovation, class management innovation, and counseling innovation were 0.280, 0.241, and 0.260, respectively. For the teachers' innovative behavior total scale, the β value was 0.300 which was significant; thus, Hypothesis 1-1 is supported. For the "individual care" dimension, the β value was -0.235 indicating significant influence on instruction innovation, which means that Hypothesis 1-2 is partially supported. Further, the results showed that the "intellectual stimulation" dimension significantly affects instruction innovation, counseling innovation, and teachers' innovative behavior total scale based on the β values obtained (0.190, 0.207, and 0.190, respectively) indicating partial support for Hypothesis 1-3. However, the "inspiration and encouragement" dimension did not reach a significant level for any dimension of the teachers' innovative behavior or total scale; thus Hypothesis 1-4 is not supported.

Table 10: Regression Analysis of the School Principal's Leadership Behavior on Teachers' Innovative Behavior

Dependent Variable / Independent Variable	Instruction Innovation	Class Management Innovation	Counseling Innovation	Total Scale
Background Variable	-.129**	.006	-.024	-.062
Job Position				
Vision Building	.280**	.241**	.260**	.300***
Individual Care	-.235**	-.022	-.070	-.135
Intellectual Stimulation	.190*	.105	.207*	.190*
Inspiration and Encouragement	.046	-.048	-.100	-.030
F Value	13.988***	7.329***	9.793***	13.191***
R ²	.132	.074	.096	.125
ΔR ²	.123	.064	.086	.116

***p<.001; **p<.01; *p<.05

Similarly, the F-values shown in Table 11 were all significant. For the “vision building” dimension of the school principal’s leadership behavior, the β values for its impact on vigor, dedication, and work engagement total scale were 0.193, 0.276, and 0.214, respectively; all reached a significant level indicating that Hypothesis 2-1 is partially supported. For the “individual care” dimension, the results of the β values obtained for dedication and absorption were found to be significant (-0.219 and -0.179, respectively) suggesting partial support for Hypothesis 2-2. However, the “intellectual stimulation” dimension did not reach a significant level for any dimension of work engagement; thus Hypothesis 2-3 is not supported. For the “inspiration and encouragement” dimension, the results of the β values for dedication, absorption, and work engagement total scale were significant (0.207, 0.267, and 0.205, respectively), indicating partial support to Hypothesis 2-4.

The F-values were also significant for the variables shown in Table 12. For the “vigor” dimension of work engagement, the β values for its impact on instruction innovation, classroom management innovation, counseling innovation, and teachers’ innovative behavior total scale were 0.180, 0.211, 0.319, and 0.263, respectively, all reaching a significant level. Therefore, Hypothesis 3-1 is supported. Moreover, the results showed that the “dedication” dimension had a significant influence on instruction innovation (β = 0.136), suggesting partial support for Hypothesis 3-2.

Table 11: Regression Analysis of the School Principal's Leadership Behavior on Work Engagement

Dependent Variable \ Independent Variable	Vigor	Dedication	Absorption	Total Scale
Background Variable - Job Position	-.120	-.055	-.054	-.046
Vision Building	.193*	.276**	.108	.214**
Individual Care	.827	-.219**	-.179*	-.144
Intellectual Stimulation	.155	.060	.116	.110
Inspiration and Encouragement	.499	.207*	.267**	.205*
F Value	14.745***	13.879***	12.067***	16.762***
R ²	.138	.131	.116	.154
ΔR ²	.129	.122	.106	.145

The “absorption” was also found to exert a significant influence on instruction innovation, classroom management innovations, counseling innovation, and teachers’ innovative behavior total scale with β values of 0.244, 0.227, 0.185, and 0.255, respectively. This means that Hypothesis 3-3 is supported.

Table 12: Regression Analysis of Work Engagement on Teachers’ Innovative Behavior

Dependent Variable \ Independent Variable	Instruction Innovation	Class Management Innovation	Counseling Innovation	Total Scale
Background Variable-Job Position	-.126**	.002	-.031	-.065
Vigor	.180**	.211***	.319***	.263***
Dedication	.136*	.029	.015	.076
Absorption	.244***	.227**	.185**	.255***
F Value	43.568***	24.620***	33.899***	47.138***
R ²	.274	.175	.227	.290
ΔR ²	.268	.169	.221	.284

***p<.001; **p<.01; *p<.05

In Table 13, all F-values were significant. The independent variable, the school principal's leadership behavior, had a significant positive impact on the mediating variable, work engagement ($\beta = 0.355$). Furthermore, work engagement had a significant impact on the dependent variable, the teachers' innovative behavior ($\beta = 0.517$).

Subsequently, the school principal's leadership behavior and work engagement underwent regression analysis with teachers' innovative behavior. In Model 1, the school principal's leadership behavior significantly and positively influenced the teachers' innovative behavior ($F = 24.932$; $\beta = 0.293$). In Model 2, work engagement was added with a significant F-value ($F = 63.032$) which resulted in a decreased regression coefficient of the school principal's leadership behavior from 0.293 in Model 1 to 0.126 in Model 2. This reduction indicates that the impact of the school principal's leadership behavior on teachers' innovative behavior is partially mediated by work engagement.

Table 13: Regression Analysis of the Mediating Effect of Work Engagement

Independent Variable \ Dependent Variable	Work Engagement	Teachers' Innovative Behavior	Teachers' Innovative Behavior	
			Model 1	Model 2
Background Variable - Job Position	-.051	-.061	-.072	-.047
School Principal's Leadership Behavior	.355***	-	.293***	.126**
Work Engagement		.517***	-	.472***
F Value	35.827***	88.646***	24.932***	63.032***
R ²	.134	.277	.097	.290
ΔR^2	.130	.274	.093	.286

*** $p < .001$; ** $p < .01$; * $p < .05$

4. Results and Discussion

4.1 Results

The results of the hypotheses testing are shown in Table 14. Among the dimensions of the school principal's leadership behavior, vision building had the highest predictive power on teachers' innovative behavior. This indicates that the more willing the principal is to collaborate with teachers to establish a unified vision for the school, the more likely teachers are to exhibit innovative behavior. Among the dimensions of work engagement, vigor and absorption exhibited the highest predictive power on teachers' innovative behavior. Manifesting vitality and being presented with challenges in the work process tend to stimulate teachers' innovative behavior. Moreover, when teachers immerse themselves in their work without succumbing to external pressures, carefully observing and contemplating the challenges they encounter, they become better equipped to identify novel and apt

approaches to overcome difficulties, thereby elevating the refinement of their work. Otherwise, work engagement plays a partial mediating role in the relationship between the school principal's leadership behavior and teachers' innovative behavior. This indicates that although the school principal's leadership influences teachers' innovative behavior, when expecting teachers to demonstrate actions divergent from the usual, concurrently eliciting teachers' personal commitment to professionalism can yield a multiplier effect, achieving results with less effort.

Table 14: Results of the Hypothesis Testing

Hypothesis	Testing Results
H1: The school principal's leadership behavior significantly influences teachers' innovative behavior.	Partially Supported
H1-1: Vision building within the school principal's leadership behavior significantly influences teachers' innovative behavior.	Supported
H1-2: Individual care within the school principal's leadership behavior significantly influences teachers' innovative behavior.	Partially Supported
H1-3: Intellectual stimulation within the school principal's leadership behavior significantly influences teachers' innovative behavior.	Partially Supported
H1-4: Inspiration and encouragement within the school principal's leadership behavior significantly influence teachers' innovative behavior.	Unsupported
H2: The school principal's leadership behavior significantly influences work engagement.	Partially Supported
H2-1: Vision building within the school principal's leadership behavior significantly influences work engagement.	Partially Supported
H2-2: Individual care within the school principal's leadership behavior significantly influences work engagement.	Partially Supported
H2-3: Intellectual stimulation within the school principal's leadership behavior significantly influences work engagement.	Unsupported
H2-4: Inspiration and encouragement within the school principal's leadership behavior significantly influence work engagement	Partially Supported
H3: Work engagement significantly influences teachers' innovative behavior.	Partially Supported
H3-1: Vigor within work engagement significantly influences teachers' innovative behavior.	Supported
H3-2: Dedication within work engagement significantly influences teachers' innovative behavior.	Partially Supported
H3-3: Absorption within work engagement significantly influences teachers' innovative behavior.	Supported
H4: Work engagement serves as a mediating variable between the school principal's leadership behavior and teachers' innovative behavior.	Partially Supported

4.2 Suggestions for Principals

It is suggested that school principals have open communication with the teachers and collaborate with them in establishing a common vision for the school. School principals should engage in rational dialogue and constructive communication with teachers regularly. Through fostering consensus and resolving differences, a shared vision can be forged. When the school's vision is collaboratively developed through discussions between the school principal and teachers, the latter are more inclined to execute the vision with enthusiasm and cultivate innovative thinking when faced with challenges, thereby achieving their goals.

This paper also suggests that school principals find ways to stimulate teachers' engagement. As leaders, school principals should exhibit proactive and positive leadership behaviors, encouraging teachers' commitment to their work to enhance engagement. The results of this study showed that the individual care dimension within the school principal's leadership behavior had a negative impact on dedication, absorption, and instruction innovation. This implies that understanding teachers' individual needs and offering relevant assistance is necessary. However, this should be done within certain limits as excessive support may lead some teachers to believe they have a safety net, potentially reducing their commitment to dedication, absorption, and instructional innovation.

Lastly, we suggest that school principals enhance their professional leadership acumen and be available to share educational insights with their teachers. For teachers to continuously improve, school principals should lead by example and actively participate in various professional development opportunities to gain insights into cutting-edge educational knowledge and enhance their leadership abilities. Activities and experiences such as delivering public lectures or organizing preparatory workshops, principals can introduce innovative concepts to teachers, along with novel teaching and mentoring methods. Moreover, school principals should encourage teachers who embrace innovation. Providing support when teachers face challenges in the innovation process is essential to empower them.

4.3 Suggestions for Teachers

This study recommends that teachers reflect on their initial aspirations of being an educator and rekindle their passion for teaching. The findings of this research indicated that, within engagement, the perception of vigor was the lowest, while the perception of dedication was the highest. Interestingly, teachers aged 30 and below exhibited higher perceived engagement and innovative behavior than other age groups. This suggests that teachers' enthusiasm is gradually waning amid societal challenges such as pension reforms and an unfriendly atmosphere towards educators. Therefore, teachers should reflect on their initial passion for the educational profession and channel this dedication into refining their work, embracing innovation to confront job challenges.

It is also suggested that teachers engage in teacher-professional communities and be prepared to commit to lifelong learning. By actively participating in teacher-

professional communities, engaging in collaborative lesson planning, sharing experiences, and participating in reflective professional discussions, teachers have the opportunity to enhance their innovative teaching abilities and establish supportive partnerships, thereby ensuring a sustained enthusiasm for their work. Furthermore, it is advisable for teachers to cultivate a lifelong learning mindset, approach new knowledge with an open attitude, and utilize newfound insights to elevate the quality of education.

Finally, this study believes that teachers must embrace innovation to confront modern challenges. In today's rapidly evolving technological landscape and fast-paced information dissemination environment, teachers should actively acquire new knowledge and understand innovative teaching methods, such as Sharestart and flipped education, to provide more effective instruction to students. Consequently, classroom management and counseling practices should also evolve with the changing times. If teachers can establish positive interactions with parents and students through social media or communication platforms, a better understanding of their needs can be achieved, leading to effective communication and a reduction in misunderstandings.

References

- [1] Bakker, A. B. and Schaufeli, W. B. (2008). Positive organizational behavior: Engaged employees in flourishing organizations. *Journal of Organizational Behavior*, 29(2), pp. 147–154.
- [2] Bakker, A. B., Petrou, P., Op den Kamp, E. M. and Tims, M. (2020). Proactive vitality management, work engagement, and creativity: The role of goal orientation. *Applied Psychology: An International Review*, 69(2), pp. 351–378.
- [3] Bass, B. M. and Avolio, B. J. (1990). *Manual for the Multifactor Leadership Questionnaire*. Consulting Psychologists Press, USA.
- [4] Chan, C. H. (2016). The relationships among workplace spirituality, work engagement, mindfulness, psychological capital, and subjective well-being: An example of Catholic organizations. Master's thesis, Fu Jen Catholic University, Taiwan.
- [5] Chang, L. J. (2011). A study of the impact of transformational leadership and organizational-based self-esteem on organizational citizenship behavior: The mediating effect of work engagement. Master's thesis, National Taiwan Normal University, Taiwan.
- [6] Chang, Y. T. (2016). Work engagement: Knowledge diffusion trajectory and recent themes. Master's thesis, National Taiwan University of Science and Technology, Taiwan.
- [7] Chen, H. H. (2004). A study of the relationship among principals' transformational leadership, the development of school vision, and teachers' organizational commitment in Kaohsiung elementary schools. Master's thesis, National Kaohsiung Normal University, Taiwan.

- [8] Chen, M. H. (2014). A study on the relationship between transformational leadership and campus crisis management of elementary school principals in New Taipei City. Master's thesis, University of Taipei, Taiwan.
- [9] Chen, T. C. (2015). A study of the relationship between identification of teacher evaluation for professional development and innovative teaching behavior of elementary school teachers in Taipei City. Master's thesis, University of Taipei, Taiwan.
- [10] Chen, T. L. (2015). A study of the relationship between elementary school principals' transformational leadership and teachers' teaching effectiveness in Tainan City. Master's thesis, Southern Taiwan University of Science and Technology, Taiwan.
- [11] Cheng, P. Y. (2008). To reveal the veil of classroom management: The research on innovative classroom management of an elementary teacher. Master's thesis, National Taiwan Normal University, Taiwan.
- [12] Cheng, T. F. and Cheng, Y. C. (2014). A study of the relationships among principals' transformational leadership, teachers' acceptance of organizational change, and school competitive advantage. *Contemporary Educational Research Quarterly*, 22(1), pp. 1–46.
- [13] Chi, S. H. (2008). A study on the relationship between the transformational leadership of female principals and school effectiveness in Taoyuan County senior high schools. Master's thesis, National Chengchi University, Taiwan.
- [14] Chin, M. C. and Wu, J. F. (2009). Exploring the relationship among principals' transformational leadership, school health, and school effectiveness: A test of the mediated-effects model. *Contemporary Educational Research Quarterly*, 17(3), pp. 83–124.
- [15] Chin, S. P. (2009). A study on the relationship between professional community interaction, teaching counseling innovation, and teaching effectiveness among vocational high school teachers in Kaohsiung City. Master's thesis, National Kaohsiung Normal University, Taiwan.
- [16] Chuang, P. C. (2013). A study on the correlation between personal classroom management style, counseling knowledge and ability improvement, and class cohesion of elementary school teachers in Tamsui District, New Taipei City. Master's thesis, University of Taipei, Taiwan.
- [17] Fang, H. Y. (2001). The rise and influence of the knowledge economy. *Journal of Education Research*, 89, pp. 9–12.
- [18] Hsieh, C. C. (2014). The rise and significance of flipped leadership. *The Educator Monthly*, 570, pp. 78–80.
- [19] Hsieh, C. C. and Chang, J. C. (2020). A study on the relationships among principal teaching leadership, teachers' job involvement, and instructional innovation. *Journal of Teacher Education and Professional Development*, 13(3), pp. 31–57.
- [20] Hsu, H. O. (2015). A study of personality traits and emotional intelligence on innovative teaching: A case study of elementary school teachers in Tainan City. Master's thesis, Kao Yuan University, Taiwan.

- [21] Hsu, S. H. (2015). The research of cultural admissions in Hakka remote schools affected by the principal's transformational leadership style. Master's thesis, National United University, Taiwan.
- [22] Huang, C. W. (2013). A study of the relationship between the implementation of electronic schoolbags and innovative teaching: The case of primary and junior high schools in New Taipei City. Master's thesis, University of Taipei, Taiwan.
- [23] Huang, Y. L. (2010). A study of the relations between instructional leadership of principals and innovative instruction of teachers in elementary schools. Master's thesis, National Pingtung University of Education, Taiwan.
- [24] Hung, Y. C. (2011). The study of interaction among transformational leadership, job involvement, and innovation. Master's thesis, Leader University, Taiwan.
- [25] Jang, H. J. (2006). A research on elementary school principals' leadership competence evaluation indicators based on the fuzzy Delphi method. *Bulletin of Research on Elementary Education*, 15, pp. 35–64.
- [26] Jantzi, D. and Leithwood, K. (1996). Toward an explanation of variation in teachers' perceptions of transformational school leadership. *Educational Administration Quarterly*, 32(4), pp. 512–538.
- [27] Jaafar, J., Hassan, N. K. N., Idris, H. and Abdallah, S. S. (2025). School leader personal traits and teacher work engagement: Leadership styles and instructional leadership as mediators. *International Journal of Research and Innovation in Social Science*, IX(VII), pp. 5777-5793. <https://dx.doi.org/10.47772/IJRISS.2025.907000465>
- [28] Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, 33, pp. 692–724.
- [29] Ke, J. H. (2015). The relationship between benevolent leadership and employee innovative behavior: Work engagement as a mediating variable. Master's thesis, National Kaohsiung University of Applied Sciences, Taiwan.
- [30] Kwon, K. and Kim, T. (2020). An integrative literature review of employee engagement and innovative behavior: Revisiting the JD-R model. *Human Resource Management Review*, 30(2), 100704. <https://doi.org/10.1016/j.hrmr.2019.100704>
- [31] Li, X., Cheng, S., Chen, N. and Wang, H. (2025). The promoting role of teachers' emotional competence in innovative teaching behaviors: The mediating effects of teaching efficacy and work vitality. *Behavioral Sciences*, 15(10), 1357. <https://doi.org/10.3390/bs15101357>
- [32] Liang, S. G., Lai, H. F., Lu, C. C. and Chen, P. H. (2021). Investigating the relationships among perceived overqualification, work engagement, and innovative behavior: Moderating effect of promotion focus. *Journal of Management and Business Research*, 38(1), pp. 125–145.
- [33] Liao, H. C. (2012). A study of the relationships between principals' transformational leadership and teachers' innovative instruction in Yunlin County elementary schools. Master's thesis, MingDao University, Taiwan.

- [34] Lin, C. C. (2016). The instructional innovation of wisdom for action orientation. *Taiwan Education Review*, 698, pp. 2–10.
- [35] Lin, H. H. (2014). The effects of transformational leadership on employees' job satisfaction and work engagement: Workplace well-being as mediator. Master's thesis, National Taipei University, Taiwan.
- [36] Lin, H. M. (1995). A comparative study on transformational leadership of school supervisors and business supervisors. Master's thesis, National Chengchi University, Taiwan.
- [37] Lin, H. Y. (2008). The effect of leadership style on organizational-based self-esteem, employee engagement, and turnover intention. Master's thesis, National Taipei University, Taiwan.
- [38] Lin, W. S. (2010). A study of relationship among school principals' change leadership and teachers' instructional innovation in Miaoli public elementary schools: Using knowledge sharing strategies as a mediator. Master's thesis, National Hsinchu University of Education, Taiwan.
- [39] Lin, J. R. (2011). Related research on teacher's attitude toward counseling effective discipline methods and classroom management of elementary school students. Master Thesis, National Sun Yat-sen University, Taiwan.
- [40] Lu, W. T. (2015). A study of the relationship between leader behavior and work engagement among part-time employees: The mediating effects of psychological contract fulfillment and high-performance human resource practices. Master's thesis, National Kaohsiung University of Applied Sciences, Taiwan.
- [41] Liu, L. and Zaman, U. (2025). From leadership to innovation: Psychological mechanisms behind teacher creativity in physical education. *Acta Psychologica*, 255, 104965. <https://doi.org/10.1016/j.actpsy.2025.104965>
- [42] Ma, S. H. (2007). Research on the status of teachers' innovative teaching in elementary schools in Taipei City. Master's thesis, University of Taipei, Taiwan.
- [43] May, D. R., Gilson, R. L. and Harter, L. M. (2004). The psychological conditions of meaningfulness, safety, and availability and the engagement of the human spirit at work. *Journal of Occupational and Organizational Psychology*, 77(1), pp. 11–37.
- [44] Ni, I. J. (2012). A study of relation between teaching innovation and organizational effectiveness of elementary school in Taoyuan county. Master Thesis, National Dong Hwa University, Taiwan.
- [45] Norouzinik, Y., Rahimnia, F., Maharati, Y. and Eslami, G. (2022). Narcissistic leadership and employees' innovative behaviour: Mediating roles of job embeddedness and job engagement. *Innovation: Organization & Management*, 24(3), pp. 355–380.
- [46] Orth, M. and Volmer, J. (2017). Daily within-person effects of job autonomy and work engagement on innovative behaviour: The cross-level moderating role of creative self-efficacy. *European Journal of Work and Organizational Psychology*, 26(4), pp. 601–612.

- [47] Pieterse, A. N., Van Knippenberg, D. and Schippers, M. (2010). Transformational and transactional leadership and innovative behavior: The moderating role of psychological empowerment. *Journal of Organizational Behavior*, 31(4), pp. 609–623.
- [48] Pu, S. W. (2003). A study on relationships between principal's transformational leadership and school cultural preference and school innovative management in elementary schools. PhD Thesis, National Chengchi University, Taiwan.
- [49] Schaufeli, W. B., Salanova, M., González-Romá, V. and Bakker, A. B. (2002). The measurement of engagement and burnout: A two-sample confirmatory analytic approach. *Journal of Happiness Studies*, 3(1), pp. 71–92.
- [50] Schaufeli, W., Bakker, A. B. and Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement*, 66(4), pp. 701–716.
- [51] Schmitt, A., Den Hartog, D. N. and Belschak, F. D. (2016). Transformational leadership and proactive work behaviour: A moderated mediation model including work engagement and job strain. *Journal of Occupational and Organizational Psychology*, 89(3), pp. 588–610.
- [52] Shen, C. T. (2016). Principal's leadership behavior of public elementary schools through influencing teacher's gratitude enhances teachers' willingness to serve or remain as administrative teachers. PhD Thesis, National University of Tainan, Taiwan.
- [53] Shiao, K. C., Chi, C. C. and Wang, S. J. (2009). Application of the principal's innovative leadership to the administration of the elementary school. *School Administrators*, 61, pp. 161-177.
- [54] Su, M. C. (2007). The study of the relationships among principals' transformational leadership behavior, teachers' organizational commitment and job involvement in elementary schools. Master Thesis, National Sun Yat-sen University, Taiwan.
- [55] Sung, C. W. (2021). The effect of principal's excellent leadership on school innovation. *Taiwan Educational Review Monthly*, 10(4), pp. 101-110.
- [56] Tsai, Y. J. (2012). A study of relationship among elementary school principals' curriculum leadership, teachers' teaching belief, teachers' innovation teaching behavior and elementary school students' creativity tendency. Master Thesis, National Hsinchu University of Education, Taiwan.
- [57] Tsai, C. H. (2020). *Transformational Leadership and School Effectiveness*. Taipei, Taiwan: Lucky Bookstore.
- [58] Tseng, J. H. (2000). Effectively promote school administrative innovation-the process and strategies of applying transformational leadership in school administration. *School Administrators*, 6, pp. 59–70.
- [59] Tseng, H. C. (2013). Transformational leadership influence on innovative behavior: The mediating effect of mental model and job engagement. Master Thesis, National University of Tainan, Taiwan.

- [60] Wang, J. D. (2015). The impact of authentic leadership and group positive affective tone on employee's engagement and problem-solving attitude. Master Thesis, Asia University, Taiwan.
- [61] Wang, X. H., Fang, Y., Qureshi, I. and Janssen, O. (2015). Understanding employee innovative behavior: Integrating the social network and leader-member exchange perspectives. *Journal of Organizational Behavior*, 36(3), pp. 403–420.
- [62] Wu, H. H. (2005). A study of the relationship between elementary school teachers' innovative teaching capability and teaching effectiveness in Taipei city and Taipei county. Master Thesis, University of Taipei, Taiwan.
- [63] Wu, R. H. (2012). A study of the relationship among job stress, humor styles and teaching innovation for elementary school teachers in Taoyuan county. Master Thesis, University of Taipei, Taiwan.
- [64] Wu, M. L. (2013). *SPSS Operation and Application: The Practice of Quantitative Analysis of Questionnaire Data*. Wu-Nan Book Inc, Taiwan.
- [65] Wu, M. L. (2014). The study of relationship between teachers' knowledge management and teachers' teaching innovation in Pintung county elementary schools. Master Thesis, National Pingtung University of Education, Taiwan.
- [66] Yang, I. C. (2010). A study on the relationship between primary school teachers' personality traits and class management effectiveness. Master Thesis, National Dong Hwa University, Taiwan.
- [67] Yeh, Y. H. (2012). The study of relationships among the transformational leadership of principal, teacher self-efficacy and innovative work behavior in vocational high schools in Taipei city. Master Thesis, National Taipei University of Technology, Taiwan.
- [68] Yeh, Y. T. (2016). The associations among transformational leadership, work intrinsic motivation and work engagement : A comparison between men and women. Master Thesis, National Kaohsiung University of Applied Sciences University, Taiwan.
- [69] Yen, Y. H. (2015). A study on the relationship between innovational instruction and teaching effectiveness of elementary school teachers in Kaohsiung city. Master Thesis, National Pingtung University, Taiwan.
- [70] Zhang, X. and Bartol, K. M. (2010). Linking empowering leadership and employee creativity: The influence of psychological empowerment, intrinsic motivation, and creative process engagement. *Academy of Management Journal*, 53(1), pp. 107–128.
- [71] Zhang, R. S. (2020). *Administration*. San Min Book Co., Ltd, Taiwan.