

**Impact of Students' Creative Self-Efficacy on their Innovative Behavior:
The Moderating Role of Innovative School Climate**

by

Solongo Myagmarjav

A Thesis Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF BUSINESS ADMINISTRATION

Major: International Human Resource Development

Advisor: Yi-Chun Lin, Ph.D.

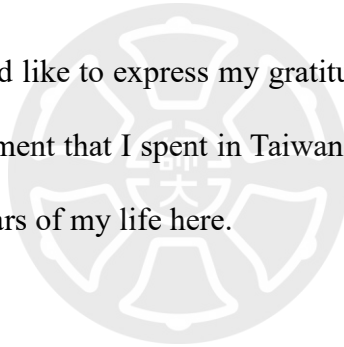
National Taiwan Normal University
Taipei, Taiwan

August 2021

ACKNOWLEDGEMENT

First of all, upon completion of this study, I would like to express my sincere gratitude to my advisor Yi-Chun Lin, for her support, understanding, and patience. This would not have been possible without her guidance, and all knowledge and experience that I have received during my program. Thus, I wish to show my sincere appreciation to all of the professors who blessed us with knowledge, skills, and wisdom. Moreover, I would like to express my deepest appreciation to all committee members, Dr. Yi-Chun Lin, Dr. Chu-Chen Rosa Yeh, and Dr. Chun-Hsiao Wang for their constructive guidance and detailed feedback on my study. It was incredibly helpful for me and I truly appreciate it. I would also like to thank all of the members and staff of the Graduate Institute of International Human Resource Development for their help and support.

Last but not least, I would like to express my gratitude for being part of this program. And I truly appreciate every moment that I spent in Taiwan with my classmates and friends. I feel blessed for spending few years of my life here.



ABSTRACT

In an educational institution, innovation is crucial for its development, achievement of educational goals, and performance. School climate that supports innovation is important for the organization and its members, as it sets the culture and behavioral expectations. An innovative climate is one of the facilitators of individual innovative behavior. And one of the most important antecedents of innovative behavior is creative self-efficacy. In other words, individuals tend to engage in innovative endeavors when they have a belief to perform creatively. This study aims to test whether innovative school climate moderates the relationship between creative self-efficacy and innovative behavior. The final sample of this study consisted of 259 undergraduate and graduate students in Taiwan which was collected via social media and local website. The data were analyzed by hierarchical regression to test the hypotheses' results. The finding of this study presented that when students have high level of creative self-efficacy, they tend to perform innovatively. Moreover, innovative school climate moderated relationship between students' creative self-efficacy and innovative behavior. In other words, when school innovative climate is high, students' innovative behavior is high than when school innovative climate is low. This demonstrates that when school climate is highly innovative it affects students' ability to generate, promote and implement new ideas. The theoretical contribution of this study is to build the framework and demonstrate the theory fits with variables. Subsequent researchers should conduct multilevel research in order to get more variance in terms of innovation. The practical contribution is to highlight the importance of an innovative school climate.

Keywords: creative self-efficacy, innovative behavior, innovative school climate

TABLE OF CONTENTS

ABSTRACT.....	I
TABLE OF CONTENTS.....	II
LIST OF TABLES.....	IV
LIST OF FIGURES.....	V
CHAPTER I INTRODUCTION.....	1
Background of the Study.....	1
Statement of the Problem.....	3
Purpose of the Study.....	4
Questions of the Study.....	5
Definition of Terms.....	5
CHAPTER II LITERATURE REVIEW.....	7
Social Cognitive Theory.....	7
Creative Self-Efficacy.....	9
Innovative Behavior.....	11
Creative Self-Efficacy and Innovative Behavior.....	12
Innovative School Climate.....	14
Moderating Effect of Innovative School Climate on Students' Creative Self-Efficacy and Innovative Behavior.....	16
CHAPTER III RESEARCH METHOD.....	19
Research Framework.....	19
Research Hypotheses.....	19
Sample.....	20
Data Collection.....	20
Questionnaire Design.....	20
Measurements.....	21
Control Variable.....	23
Pilot Test.....	24
Reliability and Correlation Analyses.....	25
Confirmatory Factor Analysis.....	26
CHAPTER IV RESULTS AND FINDINGS	32
Descriptive Statistics.....	32

Data Analysis.....	34
Hypotheses Test Results.....	34
CHAPTER V DISCUSSION AND CONCLUSIONS	38
Discussion & Conclusion.....	38
Limitations.....	39
Implications.....	40
Recommendations	41
REFERENCES.....	43
APPENDIX A: QUESTIONNAIRE.....	55



LIST OF TABLES

Table 3.1	Creative Self-Efficacy Scale (English Version).....	21
Table 3.2	Innovative Behavior Scale (English Version).....	22
Table 3.3	Innovative School Climate Scale (English Version).....	23
Table 3.4	Mean, Standard Deviation, Correlation and Reliability Analyses.....	26
Table 3.5	Confirmatory Factor Analysis Fit Indices.....	27
Table 4.1	Descriptive Statistics.....	32
Table 4.2	Regression Analysis Results for Creative Self-Efficacy Effect.....	35
Table 4.3	Hierarchical Regression Analysis Results for Moderating Effect of Innovative School Climate.....	36



LIST OF FIGURES

Figure 3.1	Research Framework.....	19
Figure 3.2	Confirmatory Factor Analysis One-Factor.....	29
Figure 3.3	Confirmatory Factor Analysis Two-Factor.....	30
Figure 3.4	Confirmatory Factor Analysis Three-Factor.....	31
Figure 4.1	Moderating Effect of Innovative School Climate on Creative Self-Efficacy and Innovative Behavior Relationship.....	37



CHAPTER I INTRODUCTION

Background of the Study

Innovation is defined as the utilization of new and better ideas according to market needs and requirements (Maranville, 1992). The constant innovation process is vital for the organization's sustainability and success (Amabile, 1988), competitive advantage (Montani et al., 2017), and performance (Bowen et al., 2010). Innovation is essential for humankind to survive and evolve. It helps human beings to advance, so they can compete for survival (Hoffman and Holzhter, 2012, p. 3). Every industry in our society has the necessity to innovate, in order to remain sustainable and successful, whether it is societal, business, industrial, educational sector. Innovation can be classified as evolutionary or revolutionary (Osolind, 2012). Evolutionary is sustaining the same but adding improvement. Revolutionary is a total change by replacing the old with the new.

Education is an essential function in our society where future talents can adopt innovation-related soft skills and be the competent market demanded individuals. When education is cultivated, it cultivates back the society. Nowadays it is becoming more challenging in this competitive environment for educational institutions to stay in business, succeed, attract and sustain students. In fact, organizational innovation is an essential factor for universities' competitive advantage and performance (Yuan and Woodman, 2010). There is a constant need in this fast-evolving society to create and implement new ways of thinking, techniques, and methods (Brewer and Tierney, 2012, p. 15). Therefore, educational institutions are in demand to change and innovate (Wildavsky et al., 2012, p. 1) their programs from traditional to innovative methods (Lundvall, 2008). Innovation in education can be implemented in all areas, such as in institutional structure and culture, theory and practice, teaching techniques, learning process, policy and procedure, technology innovations, etc (Wildavsky et al., 2012, p. 1). Thus, innovation plays a crucial role in education by

creating a sustainable future. The Ministry of Education of Taiwan encourages and supports educational institutions to apply innovation into their system. Moreover, the Ministry of Education conducts a creativity contest each year to help students to develop and express their creativity. In addition, local students also compete with international students to expand their international outlook (Fan et al., 2015).

Innovation can be divided into two levels: individual and organizational (Mumford, 2000). At an educational organization level, in order to improve school performance and to achieve educational goals, innovation could be the tool for school development (Wu & Lin, 2003). The innovation process includes not only generating and using new ideas but also encouraging others to present their novel ideas (Yuan & Woodman, 2010). And at an individual level, innovation starts from developing new ideas. The production of innovative ideas starts from problem recognition, from there on generating new solutions or ideas, and consequently applying them. In order for individuals to innovate, creative self-efficacy level is important. Creative self-efficacy is one of the influential predictors of innovative behavior, creativity, and creative performance (Beghetto, 2010; Ford, 1996; Parker et al., 2006; Patterson et al., 2009; Tierney & Farmer 2002, 2004). Individuals with a high level of creative self-efficacy tend to demonstrate more innovative behavior than individuals who have a low level of creative self-efficacy (Hsu et al., 2011). Moreover, studies have shown that environmental factors enhance individual innovative behavior (Park & Jo, 2018). A strong climate for innovation had a significant impact on strong service innovative behavior and had less impact when it was weaker (Dhar, 2015). In order to create an innovative climate, it is important to determine that creativity and risk-taking activities are supported, and individuals can be not threatened psychologically (Parzefall et al., 2008). Organizations that support innovation provide autonomy for their employees to create innovations (Kanter, 1983). Supporting innovation by encouraging employees to be creative impacted organization

effectiveness (Oliveira et al., 2013) and employees demonstrated positive work-related behavior (Tsai et al., 2015). Employees with innovative behavior initiate and implement innovation in the organization (Yuan and Woodman, 2010). Individual innovative behavior is the vital factor to enhance innovation and performance (Bunpin et al., 2016; Kanter, 1988; Scott & Bruce, 1994) and sustainable competitive advantage (Zhang & Bartol, 2010).

Statement of the Problem

In a fast-changing society, educational institutions have the necessity to alter their programs (Lundvall, 2008). Adopting innovation could help to achieve educational goals and prepare future competent talents. Many personal and environmental factors impact innovative behavior to develop and enhance. According to Bandura's social cognitive theory, there is the triadic factor that predicts human behavior (Bandura, 1997). Those factors are individual, behavioral, and environmental. Creative self-efficacy is one of the individual factors that predict innovative behavior. In Taiwan, for the past couple of decades studies have been conducted, the testing relationship between creative self-efficacy and innovative behavior across different fields such as librarians (Peng, 2016), creativity contestants (Fan et al., 2015), hospitality employees (Teng et al., 2019), service employees (Hsu et al., 2011), college students (Chang & Yang, 2012; Li & Wu, 2011; Shiu & Lin, 2012), and university teachers and students (Chang, 2018). In terms of environmental factors, climate for innovation plays important role in enhancing individual innovative behavior (Amabile et al., 1996; Dhar, 2015). There are research papers that tested direct (Kermani & Solhdoost, 2016; Park & Jo, 2015) and indirect (Dhar, 2015; Li & Luo, 2010; Pundt, 2015; Zhang et al., 2018; Yu et al., 2018) effects of innovation climate on innovative behavior. However, a handful of published studies have examined innovative school climates based on social cognitive theory. Yang and Chang's (2012) study among college students tested the social cognitive theory in

organizational innovation climate. However, only a direct relationship between had been tested, organizational innovation climate as a predictor and students' creative self-efficacy and innovative behavior as the outcome variable. Therefore, it appears to be that the research gap should be addressed, considering that moderating effect of innovative school climate needs to be researched based on social cognitive theory. Thus, the first gap in this study is to use social cognitive theory to build relationships among creative self-efficacy, innovative school climate, and innovative behavior. The second gap of this study is that social cognitive theory uniquely fits this study sample, as this theory is an extension of social learning theory. Social learning theory is a cognitive process that takes place in a social context. Therefore, conducting a study in a learning environment and collecting data from students is a good setting to test the theory. Moreover, Yang and Chang (2012) tested this theory with the same sample.



Purpose of the Study

Innovation is a never-ending process. In order to innovation to take place and remain in the organization, individuals and their skills are the most important tools (Park & Jo, 2016). The job market requires numerous soft skills from talents that are not taught in educational institutions. The importance of innovation-related skills is rising in the job market and in all aspects of society. Soft skills such as innovative behavior can be developed through personal, behavioral, and environmental factors. One of the most influential personal factors that predict individuals to innovative behavior is creative self-efficacy (Newman et al., 2018). And one of the environmental factors that enhance innovative behavior is the innovative climate (Zhang et al., 2018).

Therefore, in this study predictor variable is students' creative self-efficacy, the outcome variable is innovative behavior, and the moderator variable is innovative school

climate. In other words, test if students' creative self-efficacy level is high, their innovative behavior level will be high as well. And when the school climate is highly innovative then the strength of this relationship will be stronger. According to previous research evidence, innovative school climate positively impacts creative self-efficacy and innovative behavior (Chang & Yang, 2012). Thus, this study aims to bring attention to the importance of an innovative school climate and its impact on creative self-efficacy and innovative behavior relationships.

Questions of the Study

1. Are students with a higher level of creative self-efficacy can be more innovative than students with a lower level of creative self-efficacy?
2. Can the relationship between students' creative self-efficacy and innovative behavior can be enhanced by an innovative school climate?

Definition of Terms

Creative Self-Efficacy

Creative self-efficacy is defined as, “the belief that one has the ability to produce creative outcomes” (Tierney & Farmer, 2002, p. 1138).

Innovative Behavior

Innovative behavior is defined as the ability to generate new ideas, promoting, and implementing them (Janssen, 2000; Scott & Bruce, 1994).

Innovative School Climate

Climate for innovation is defined as “the extent to which the values and norms of an organization emphasize innovation” (King et al., 2007, p. 634).



CHAPTER II LITERATURE REVIEW

Social Cognitive Theory

Bandura's Social cognitive theory was based on learning by observing others. Individuals' past behavior and experiences in certain circumstances impact their future behavior when they are in a similar situation. Social cognitive theory has been used in different sectors, such as education, psychology, communication, and business, etc. Social cognitive theory (Bandura, 1977, 1986), has triadic reciprocal determinants that explain human behavior; those are personal, behavioral, and environmental. In other words, external and internal factors influence individuals to acquire and maintain the behavior in an environment where individuals perform the behavior. Therefore, social cognitive theory is used to build the framework of this study and support the relationship among creative self-efficacy, innovative school climate, innovative behavior variables.

There are five sources of social cognitive theory that help to establish and develop an individual's self-efficacy (Bandura, 1997). However, these five sources are guidance to understand the antecedents of creative self-efficacy, these also give an understanding of how individual self-efficacy, behavior, and environment causal relationship leads to outcome behavior.

First, enactive mastery experience is when individuals observe, memorize, and learn from their leader/role model in a certain circumstance. When an individual has past successful experience performing a task in a certain domain, it gives them the confidence to perform similar tasks in the future. Meaning their self-efficacy level gets higher in that domain. Highly efficacious people evaluate their capabilities in that domain to perform tasks and achieve their goals. Moreover, in this case, they not only feel confident about skills, knowledge, and experience but also, tend to perform creatively (Bandura, 1997; Stajkovic & Luthans, 1998). For example, students obtain new lessons from their teachers by observing

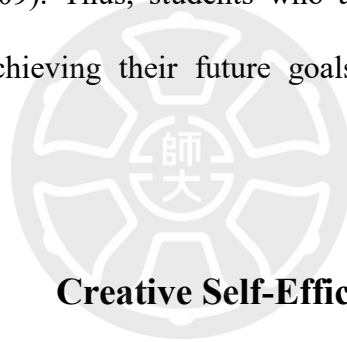
and memorizing. Students utilize that knowledge and skills later when they are in a similar situation and if they have a high level of creative self-efficacy they tend to take an innovative approach.

Second, vicarious experience is learning through modeled behavior. This type of learning gives individuals to acquire different behavioral patterns safely, considering it was obtained from a competent model. However, when the action is complicated, it has more chance to be risky (Stajkovic & Luthans, 1998). For example, educators and principals are the role models for students, inside and outside of the class in a school environment. Students do not only learn from the new knowledge and skills related to subjects but also learn about social, personal, and behavioral skills. If a school has an innovative climate and its members advocates innovation within and outside classrooms, it is possible that students would be impacted by that and consequently act creatively.

Third, verbal persuasion helps to enhance individuals' self-efficacy belief, but not necessarily their skills and abilities. However, an individual must have the ability to perform a task, so then it can be more effective when they are appraised by someone, whom they see as a role model or a leader (Stajkovic & Luthans, 1998). Verbal persuasion works when subordinates believe in their efficacy and actions (Chambliss and Murray, 1979). When employees feel support from their leaders, they tend to perform better and innovatively (Shalley & Gilson, 2014). If leaders believe that their subordinate possesses necessary skills and abilities, they encourage them to do challenging tasks or perform creatively. For example, if a teacher knows that a student has capabilities to perform better in a certain subject, their encouragement could impact students' confidence and efficacy beliefs, which eventually could impact students' performance and even their creativity level. Students' perceived encouragement of professors had a significant effect on their creative self-efficacy (Puente-Diaz & Cavazos-Arroyo, 2017).

Fourth, psychological feedback is a psychological and emotional state. Some people tend to find this state as a vulnerable state. For example, stress might impact an individual's performance. However, highly efficacious individuals see work stress as a motivating factor, versus, low efficacious individuals let it hinder their performance. Another example, if a student is in a bad state mentally and emotionally due to the environment in school or at home, then his/her efficacy beliefs and performance can be affected.

In addition to four of Bandura's sources, psychologist James Maddux (2009) suggested the fifth impact, which is an imaginal experience - an individual visualization of itself performing successfully a given task. For example, students whose creative self-efficacy levels were high, had belief in their academic abilities and tend to have plans for higher education (Beghetto, 2009). Thus, students who are confident in their capabilities could easily see themselves achieving their future goals based on their past successful experiences.



Creative Self-Efficacy

Creative self-efficacy is defined as, “the belief one has the ability to produce creative outcomes” (Tierney & Farmer, 2002, p. 1138). Creative self-efficacy is derived from the general concept of self-efficacy, which is an individual's belief to perform a task successfully in a particular setting (Bandura, 1997). Both terms are based on Bandura's social cognitive theory (1986, 2001).

In an academic setting, various determinants and consequences of creative self-efficacy have been researched. Polish high school students' creative self-efficacy was significantly predicted by creative abilities (Karwowski, 2011). However, few percentages of the students with creative abilities did not see themselves as creative. And vice versa, students who were not innovative but perceived themselves as creative. The same results showed in

qualitative research, that examined the relationship between creative self-efficacy and creative behavior, among different nationality college students. In this case, the reason for such an outcome was a misunderstanding of the creativity concept (Lemons, 2010).

Another study that held among middle and secondary students showed that group of students with a higher level of creative self-efficacy were creative, concentrated on academics and self-development, such as after-school activities. And these students also had the intention to get higher education, over a group of students who had a lower level of creative self-efficacy. Surprisingly, these creative students felt unheard and invisible, and that teachers were given up on them. In order to get their teachers' validation, they were motivated to overperform (Beghetto, 2006). The reason for this might be that students with a high level of performance-approach beliefs focus on doing better and looking better than others. So, their competitive nature might be the reason for wanting that attention from their teachers. Thus, teachers' feedback and support could predict creativity under certain conditions (Beghetto, 2016; Karwowski et al., 2015).

Moreover, creativity can be improved through a variety of types of training (Rose & Lin, 1984; Scott et al., 2004; Torrance, 1972). In one university, 180 undergraduate students went under 9 weeks of creativity training program, specifically creative self-efficacy and creative production. Pre and post-tests were taken to understand the effect of the program. The result indicated a significant increase in both of them (Byrge & Tang, 2015). Thus, the outcome embodied creativity training shows improvement in trainees' awareness and confidence in creativity skills (Choi, 2004), generation of new ideas, open-mindedness, and positivity. In other intervention studies that conducted 1-day training versus 1-week training, both group results had no difference (Karwowski & Soszynski, 2008; Mathisen & Bronnick, 2009). Significant growth had been observed in students' and employees' creative self-efficacy and have not declined two months after the assessment (Mathisen & Bronnick,

2009). This result aligned with other studies on how creativity training increased the level of creative self-efficacy among students and employees (Frederick et al., 1984; Gist, 1989; Robbins & Kegley, 2010).

Thus, understanding the development of individuals' creative self-efficacy is important for an organization (Tierney & Farmer, 2011). Creative self-efficacy development happens when an individual evaluates their personal and organizational resources and limitations. Then they administer their knowledge and after a certain period of time, they obtain their efficacy belief (Gist & Mitchell, 1992). Moreover, individuals with creative self-efficacy tend to have assurance and motivation to implement tasks (Bandura and Cervone, 1983). Individuals are more creative when their creative self-efficacy is higher (Tierney & Farmer, 2002, 2004). Thus, it increases their confidence and innovative behavior (Gong et al., 2009; Jiang & Gu, 2017; Tierney & Farmer, 2002, 2011).



Innovative Behavior

Individual innovative behavior consists of idea generation, idea promotion, and idea realization (Janssen, 2000; Scott & Bruce, 1994). Innovative behavior was defined by many researchers in slightly different ways. Early on, in the work setting, it was defined as the creation, adoption of new useful ideas, and implementation of them at the work setting (Kanter, 1988; Scott & Bruce, 1994; Van de Ven, 1986). Later, it was defined as an individual's behavior to have the intention to create, cite and utilize novel ideas (Anderson et al., 2014; Janssen, 2000). In an organization, employees play a critical role in innovation and are responsible for 80% of creative ideas performance (Getz & Robinson, 2003). Over the years, many research papers discovered a variety type of factors that impact individual innovative behavior (Noefer et al., 2009; Scott & Bruce, 1994; Woodman et al., 1993). Studies have also shown that innovative behavior is one of the beneficial factors in

organizational performance (Janssen et al., 2004) and increases its effectiveness and efficiency (Xerri and Brunetto, 2013). In one study, reasons for employees being innovative were correlated to extrinsic rewards and job tenure. In other words, employees act innovatively when they had job stability and when they knew their effort is going to be rewarded fairly (Janssen, 2000).

In Taiwan, over the years individual innovative behavior has got more attention in diverse fields, such as among university students (Shiu & Lin, 2012), librarians (Peng, 2016), university teachers (Chang, 2018), secondary school teachers (Hsiao et al., 2011), creativity contestants (Fan et al., 2015), hospitality employees (Teng et al., 2019), and service employees (Hsu et al., 2011).

In a school setting, teachers' open-mindedness and ability to accept students' creative endeavors are important for students. An open-minded qualitative study has gotten a survey from different nationality college students. Students were asked what happens when they act creatively in classes (Lemons, 2010). Many students replied that they were criticized for being innovative, by their parents and teachers, and some students expressed that school is not the place to behave creatively. Most students said that criticism in school is a normal thing. Some of the students replied that their school opposes creativity and they do not even try to be creative because they were hurt by criticism (Lemons, 2010). In summary, it appears to be how important is to create a psychologically safe environment for students to feel comfortable, to express themselves creatively without shame, and not feel judged. Such a supportive environment could impact students to grow academically and personally.

Creative Self-Efficacy and Innovative Behavior

Bandura (1997, p. 239) stated that innovation is utilizing knowledge in a new way, and individuals to create new endeavors need to have a sense of self-efficacy. Meaning,

individual behavior can be predicted on the foundation of individual self-efficacy (Stajkovic and Luthans, 1998) and it plays an important role in its growth (Tierney & Farmer, 2011; Wang et al., 2014).

When people possess knowledge, skills, and abilities in a certain sphere, their creative self-efficacy level is high in that area (Puente-Diaz, 2016). And people with a high level of creative self-efficacy evaluate their capabilities in order to perform their tasks and achieve their goals (Bandura, 1997, 2001; Chong & Xiaofang, 2010; Gist & Mitchell, 1992). They put more effort into creative cognitive processes, such as identifying a problem, considering concepts, and looking for innovative ideas. In the event of difficulties, they are still able to perform the tasks successfully by displaying innovative behavior (Beghetto, 2006; Gong et al., 2009; Michael et al., 2011; Peng, 2016). On the contrary, people with a low level of creative self-efficacy tend to not engage in creative tasks cause of fear of failure.

In recent years, a number of studies have been done on individual creative self-efficacy as the antecedent of innovative behavior across different settings. (Gong et al., 2009; Hong, 2004; Jaussi et al., 2007). For example, in Taiwan this relationship had been tested among librarians (Peng, 2016), creativity contestants (Fan et al., 2016), hospitality employees (Teng et al., 2019), service employees (Hsu & Fan; 2010), college students (Chang & Yang, 2012; Li & Wu, 2011; Shiu & Lin, 2012;), and university teachers and students (Chang, 2018; Wu & Yu, 2019).

Wu was co-author of two studies that held among college students, students' creative self-efficacy was positively associated with students' innovative behavior (Li & Wu, 2011; Fan et al., 2016). In both studies, creative self-efficacy successfully mediated the relationship between innovative behavior and optimism (2011), and innovative behavior and entitlement (2019).

Another study in Taiwan, among students from different universities who took

creative courses, showed that students' belief to perform creatively was increased through learning motivation, and in turn assisted in students' innovative behavior (Shiu, Lin & Chien, 2012). This result aligned with Ford's (1996) that self-efficacy is an important element in the motivation of individuals, and that it will lead to creative performance.

A study that received 756 valid questionnaires from students at the University of Technology of Taiwan, proved that students' creative self-efficacy had a significant correlation with students' innovative behavior (Chang & Yang, 2012). The results showed that students' creative self-efficacy effectively improves students' innovative behavior at school. The result of this study aligns with other studies that had similar results about creative self-efficacy being an important factor for their innovative behavior and performance (Chang & Yang, 2012; Huang & Hung, 2009; Tierney & Farmer, 2002, 2004).

In conclusion, when individuals possess skills, knowledge, experience in a certain domain, they tend to have a high level of creative self-efficacy and confidence, which makes those individuals act productively and creatively (Chang, 2012, 2018; Gong et al., 2009; Richter et al., 2012; Tsai et al., 2015). All of these studies prove that creative self-efficacy is an essential predictor of innovative behavior. Thus, this research proposes as below:

***Hypothesis 1:** Students' creative self-efficacy is positively related to their innovative behavior.*

Innovative School Climate

Organizational school climate can be described as features that differentiate from one school to another, it is based on shared perceptions of behavior and impacts school members' behavior, which are administrative personnel, teachers, and students (Hoy & Miskel, 2005).

According to the organizational theory viewpoint (Cummings & Worley, 2008), organizational climate, system, and employees' action impact organization innovation.

Therefore, innovative organizations should be open-minded, staffs are ready for change (Saleh & Wang, 1993), eager to adopt an innovative climate (West, 2002), and act innovatively (Moon & Choi, 2014).

Innovative school climate affects interaction among students, teachers, and principals (McEvoy and Welker, 2000), who share perceptions and descriptions of the school (Chin, 1997). According to researchers, innovation abilities in the education sector needs to be developed for various reasons. Innovative school climate brings benefits for school effectiveness, development of traits, achieving educational goals (Wu & Lin, 2003), and quality and school system (McCharen et al., 2011; McRoy & Gibbs, 2009). Education is one way to develop students' innovative thinking (Andiliou & Murphy, 2010) so psychological and physical support is needed to improve creative behaviors (Choi et al., 2013; West, 1990). One of the main goals of educational institutions is to help students gain demanded skills in this constantly evolving society (Schleicher, 2012).

As from the educational organization side, some innovative school climate factors were considered in previous studies. Financial support, a fund spent on education, resources, members, and students was an important factor for transformation in some studies (Ross, 1958) and not in others (Carlson, 1965; Scott & Bruce, 1994). In order to adopt new adjustments, thoroughly planned and thought change is necessary (Hansen, 1967). Create new supportive policies, systems, and safe environments to facilitate teachers' behaviors (Song et al., 2014) and innovativeness. School administrative staff and teachers' perception about innovation is also considered essential. The climate that encourages teachers to express and share their new ideas and knowledge, work collaboratively with others is a good supportive climate (Song et al., 2014). In a study that held among innovative and traditional schools, surprisingly administrative staffs in innovative schools were much more open to change but teachers were not, even though innovative schools demonstrated a more open

climate (Marcum, 1968). This might be related to teachers' unwillingness to change and spending time on acquiring new skills that teachers may or may not be confident about. Additionally, innovative school expenditure was high, but it did not impact students' performance.

Moderating Effect of Innovative School Climate on Students'

Creative Self-Efficacy and Innovative Behavior

Climate for innovation can be a great predictor of innovation and creativity (Patterson et al., 2005). It plays important role in promoting innovative behavior (Scott & Bruce, 1994) which ultimately brings benefits for the organization in a fast-evolving economy (Hsu and Fan 2010; Pieterse et al., 2010). In organizations with innovative climates, members are encouraged to be creative and experiment (Kaemmerer & Siegel, 1978). For the reason that their opinions are valued and respected (Cohen-Meitar et al., 2009; Daft and Becker 1978). When there is such an innovative climate, people are not afraid of expressing themselves freely and do not have a feeling of shame when they take risks. Employees would not act innovatively if making changes and taking risks are not encouraged by the organizational environment (Yuan and Woodman, 2010).

Innovation occurs when there is an interaction between human and social context (Woodman et al., 1993; Zhou, 2003), specifically in an innovative environment. Social cognitive theory plays a motivational role in the innovation and creativity process (Bandura, 1997). It has personal, behavioral, and environmental triadic factors that explain human behavior in a social context. However, the impact of these causal factors is not equal, some can be stronger and some can be weaker (Bandura, 1989). In this study, social cognitive theory triadic factors build and supports the research framework. Therefore, in this research creative self-efficacy represents personal factor, innovative behavior represents behavioral

factor, and innovative school climate represents environmental factor.

The relationship between innovative climate and innovative behavior has been studied in organizations a number of times (Hunter & Mumford, 2007; Ren & Zhang, 2015; Shanker et al., 2017). Similarly, in school settings number of studies have been studied on how support for innovation affects innovative behavior (McCharen et al., 2011; Moolenaar et al., 2010). Creative self-efficacy also had been tested many times across different fields and demonstrated that it has a significant effect on individuals' creative behavior (Tierney & Farmer; 2002, 2004). Along with many other research papers, creative self-efficacy as well predicted individual creativity (Gong et al., 2009). A study that collected data from hospitality employees shown that individuals with a high level of creative self-efficacy tend to show creative behavior and when they are in innovation supported climate (Jaiswal & Dhar, 2015).

However, there are numerous studies where creative self-efficacy, innovative behavior, and innovative school climate are studied together, there is still a lack of published research papers where the moderating effect of innovative school climate has been tested on creative self-efficacy and innovative behavior. There is a study where all of these three variables had been tested among students. Though there was no moderating or mediating effect have been tested, only direct effect. Innovative school climate had a significant positive impact on students' creative self-efficacy and their innovative behavior. In other words, students' creative self-efficacy and students' innovative behavior were high when rich resources, teachers' encouragement, and organizational support were higher (Chang & Yang, 2012). In other words, individual innovative behavior is impacted by personal and environmental factors. This can be explained as when innovation is in the climate with adequate resources to be creative, and when role models support students to express their creativity, all of these factors create an effective foundation and support system. This result supports previous studies McCharen et al.(2011), Moolenaar et al. (2010), and Tubin (2009).

Hence, this study proposes to test whether innovative school climate strengthens the relationship between students' creative self-efficacy and innovative behavior.

***Hypothesis 2:** Innovative school climate positively moderates the relationship between students' creative self-efficacy and innovative behavior.*



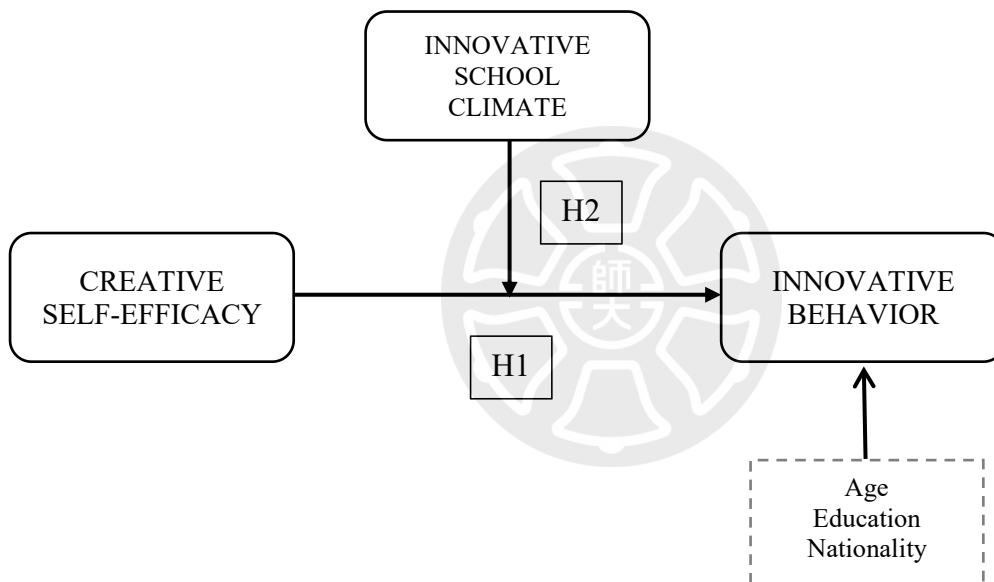
CHAPTER III RESEARCH METHOD

Research Framework

The present study proposed students' creative self-efficacy as the independent variable, students' innovative behavior as the dependent variable, and innovative school climate as a moderator, and age, education, and nationality as control variables (Figure 3.1).

Figure 3.1

Research Framework



Research Hypotheses

Hypothesis 1: Students' creative self-efficacy is positively related to their innovative behavior.

Hypothesis 2: Innovative school climate positively moderates the relationship between students' creative self-efficacy and innovative behavior.

Sample

The sample of this study was a total of 259 undergraduate, master's, and Ph.D. students from private and national universities in Taiwan. Participants were asked if they were university and college students to verify that they are a suitable sample for the survey. This sample was chosen due to young adults might have possibilities to show a higher level of creativity and innovative behavior because of their learning and developing stage. Additionally, the sample was well fit for the theory of this study.

Data Collection

Convenient sampling was used for this data collection. Online quantitative questionnaires were distributed both in English and Mandarin languages. Data collection had been collected via local websites and social media, such as Facebook and Line groups. At the end of the survey, participants were led to the link with a variety of topic e-books (i.e., self-help, spiritual, mental health, etc.) as an incentive. The online data collection was conducted from May to July, 2021. Participants were asked duration of study in the same university or college to verify that they have been studied for a minimum of one semester.

Questionnaire Design

The survey consisted of 29 items and three dimensions to measure three variables, two screening questions, and six demographic questions which three of them also control variable questions.

Due to participants of this survey were Taiwanese and non-Taiwanese students, the questionnaires were translated both into Mandarin and English languages. Creative self-efficacy (Karwowski, 2013) and innovative behavior (Janssen, 2000) measurements were originally developed in English, which was translated into Mandarin, and innovative school

climate (Chang & Yang, 2012) measurement was originally developed in Mandarin was translated into English.

Measurements

Creative Self-Efficacy

Karwowski and other researchers (2013) composed 11-item measurements for creative self-efficacy (6 items) and creative identity (5 items). In this study, creative self-efficacy six items were used. The instrument used a 5-point Likert scale, from 1 (*definitely not*) to 5 (*definitely yes*). The internal consistency for creative self-efficacy is .81 ($\alpha \geq .70$).

Table 3.1

Creative Self-Efficacy Scale (English Version)

English version

1. I know I can efficiently solve even complicated problems.
 2. I trust my creative abilities.
 3. Compared to my friends, I am distinguished by my imagination and ingenuity.
 4. Many times, I have proved that I can cope with difficult situations.
 5. I am sure I can deal with problems requiring creative thinking.
 6. I am good at proposing original solutions to problems.
-

Note. Adapted from “Big five personality traits as the predictors of creative self-efficacy and creative personal identity: Does gender matter?,” by M. Karwowski, I. Lebuda, E.

Wisniewska, and J. Gralewski, 2013, *The Journal of Creative Behavior*, 47(3), 215-232.

Innovative Behavior

Janssen developed (2000) 9-item scale of innovative behavior. The instrument used a 7-point Likert scale, from 1 (*never*) to 7 (*always*). This measurement was developed for

organizational employees, therefore small alterations had been made in order to fit the student sample. The internal consistency for innovative behavior is .91 ($\alpha \geq .70$).

Table 3.2

Innovative Behavior Scale (English Version)

Janssen, 2000	Modified for students
1. Creating new ideas for difficult issues.	1. I create new ideas for difficult issues.
2. Searching out new working methods, techniques, or instruments.	2. I search out new studying methods, techniques, or ways.
3. Generating original solutions for problems.	3. I generate original solutions for problems.
4. Mobilizing support for innovative ideas.	4. I mobilize support for innovative ideas.
5. Getting approval for innovative ideas.	5. I get approval for innovative ideas from my teachers.
6. Making important organizational members enthusiastic about innovative ideas.	6. I make my classmates enthusiastic about innovative ideas.
7. Transforming innovative ideas into useful applications.	7. I transform innovative ideas into useful applications.
8. Introducing innovative ideas into the work environment in a systematic way.	8. I introduce innovative ideas in class
9. Evaluating the utility of innovative ideas.	9. I evaluate the utility of innovative ideas.

Note. Adapted from “Job demands, perceptions of effort-reward fairness, and innovative work behavior,” by O. Janssen, 2000, *Journal of Occupational and Organizational Psychology*, 73(3), 287-302.

Innovative School Climate

Chang & Yang revised (2012) 14-item scale was developed with three dimensions, which are organizational support, teachers’ encouragement, and rich resources. The instrument 5-point Likert scale, from 1 (*strongly disagree*) to 5 (*strongly agree*). The internal

consistency for innovative school climate is .93 ($\alpha \geq .70$).

Table 3.3

Innovative School Climate Scale (English Version)

English version

1. This school has the freedom to be creative.
2. Breakthroughs and innovations are the characteristics of our school.
3. Our school supports creative solutions, even if resources are limited.
4. The school often encourages students to try to solve problems in creative and novel ways.
5. I think our school can accept different opinions.
6. Whether students' creative ideas are accepted or not, they can be recognized by the school.
7. I often feel that teachers care about me.
8. My teacher always gives me credit for my performance.
9. I often feel my teacher's friendliness and kindness.
10. The teacher will guide me to look at "old problems" from "new concepts".
11. When the event of facing problems, the teacher will give enough flexibility and freedom to help solve the problem.
12. I can freely use the relevant equipment of this school.
13. I can get sufficient information from this school to complete the assignment.
14. My school offers innovative courses to meet my needs.
15. The school's innovative counseling system can provide consulting services.

Note. Adapted from “The effect of organization's innovational climate on students' creative self-efficacy and innovative behavior,” by J. C. Chang, and Y. L. Yang, 2012, *Business & Entrepreneurship Journal*, 1(1), 75-100.

Control Variable

Age, education, and nationality were used as control variables in this study to

understand the demographic impact on the sample of the study.

Age

In previous studies, age correlated with innovative behavior (Zhou et al., 2019). Thus, in this study age was taken as a control variable to test if the younger population is more creative than the older population because they have more need to learn and obtain new skills and experience than the older generation. However, on the other hand, the older generation might be more creative than the younger population because they already possess the necessary skills and experiences. Thus, they have the necessary foundation to be creative.

Education

Education degree had a correlation with innovative behavior, previously (Su et al., 2019). Thus, this study proposes to test whether graduate students are more creative than undergraduate students. This could be explained as the nature of master and Ph.D. students' programs tend to have more freedom and flexibility to perform their assignments, which raises the question if graduate students can be more creative than undergraduate students.

Nationality

Nationality was taken as the control variable in order to see whether there is a difference between Taiwanese and non-Taiwanese students. Differences were observed among nationality groups on creative self-efficacy and creative production (Byrge & Tang, 2015).

Pilot Test

Before data collection, a pilot study had been conducted to examine the reliability and validity of measurements. The sample of the pilot test were 114 undergraduate and graduate students in Taiwan, 103 Taiwanese (90.4%) and 11 foreigners (9.6%), 67 females (58.8%) and 47 males (41.2%), most of the participants were from age 21 to 25 (70.2%), 89

undergraduate (78.1%), 20 master (17.5%), five PhD (4.4%) students, and most students attended university for two to four ($N = 73$, 64%) and six ($N = 19$, 16.7%) semesters.

Reliability analysis results Cronbach's alpha for creative self-efficacy was $\alpha = .81$, innovative behavior was $\alpha = .93$, and teacher support was $\alpha = .77$. According to Nunnally (1978), Cronbach's alpha acceptable value is ≥ 0.7 , which indicates all items had an acceptable fit.

Exploratory factor analyses had been conducted on creative self-efficacy six items to determine underlying factor structure. The descriptive statistics show that creative self-efficacy mean value ranges from 3.54 to 3.82, and standard deviation ranges from .606 to .731. The correlation level of items is all below .80 and the determinant value is .169, which is greater than .001. The cumulative explained variance of 42.5%. The result of the KMO measure of sampling adequacy is .836, which is greater than 0.6, exceeding recommended value (Kaiser, 1974). The value of BTS indicates .000 ($p < .001$), which is statistically significant, thus it supports the factorability of the correlation matrix.

Reliability and Correlation Analyses

The reliability analysis had been conducted to test the internal consistency of variables and Pearson's correlation had been conducted to test correlation among variables. Table 4.2 presented the mean, standard deviation, correlation, and reliability analyses' results of creative self-efficacy, innovative behavior, innovative school climate, age, education, and nationality.

The Cronbach's alpha acceptable coefficient is $\geq .70$ (Nunnally, 1978). Table 4.2 demonstrates Cronbach's alpha for creative self-efficacy ($\alpha = .81$, $\alpha \geq .70$), innovative behavior ($\alpha = .91$, $\alpha \geq .70$), and innovative school climate ($\alpha = .93$, $\alpha \geq .70$). The result

indicates that creative self-efficacy, innovative behavior, and innovative school climate all demonstrate acceptable internal consistency.

The results of correlation analyses as shown on Table 4.2 demonstrates that creative self-efficacy has a significant correlation with innovative behavior ($r = .66, p < .01$). Innovative school climate has a significant correlation with creative self-efficacy ($r = .38, p < .01$) and innovative behavior ($r = .44, p < .01$). The results show that there are positive correlation among all variables.

Table 3.4

Mean, Standard Deviation, Correlation and Reliability Analyses

	Mean	SD	1	2	3	4	5	6
1. Creative Self-Efficacy	3.8	.50	(.81)					
2. Innovative Behavior	4.8	.88	.66**	(.91)				
3. Innovative School Climate	3.8	.55	.38**	.44**	(.93)			
4. Age	0.2	0.9	.00**	-.005	-.04			
5. Nationality	0.7	4.1	-.20**	-.01	.21**	-.22**		
6. Education	0.1	0.5	.01**	-.02	-.22**	.33**	-.38**	

Note. $N = 259$. Cronbach's alphas are shown in the brackets.

* $p < .05$. ** $p < .01$

Confirmatory Factor Analysis

This study conducted confirmatory factor analysis in SPSS Amos 26, before hypotheses testing. The confirmatory factor analysis was used to examine the fit of hypothesized measurement models and data. In total of 259 samples were used in this test. In the present data three latent constructs composing 29 observed indicators were tested; creative self-efficacy six items, innovative behavior nine items, and innovative school climate 14 items. During the CFA test in SPSS AMOS, item seven of innovative school climate was

removed due to low factor loading.

The following items' fit for hypothesized models were assessed using a range of fit indices (Table 4.4), Chi-square (χ^2) to confirm the model fit, degrees of freedom (df) shows the number of independent values, model fit value $p < 0.5$. The ratio of chi-square to degrees of freedom (χ^2/df) indicates the difference between observed and expected covariance matrices, acceptable model fit value is $2.0 < \chi^2/df < 5.0$ (Carmines & McIver, 1981). The comparative fit index (CFI) indicates a discrepancy between the data and the hypothesized model, the acceptable model fit value is $CFI > 0.90$ (Hu & Bentler, 1999). Root Mean Square Error of Approximation (RMSEA) to confirm model and population fit, acceptable model fit value is $RMSEA < 0.80$ (Browne & Cudeck, 1993). Standardized root mean square residual (SRMR) provides information about average discrepancy correlations between covariance matrix and predicted model, acceptable model fit value is $SRMR < .80$ (Hu & Bentler, 1999; McDonald & Ho, 2002).

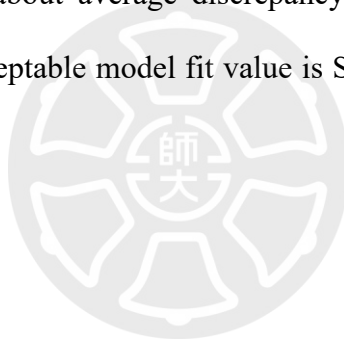


Table 3.5

Confirmatory Factor Analysis Fit Indices

	χ^2	df	χ^2/df	CFI	RMSEA	SRMR
Creative Self-Efficacy	34	9	3.8	.94	.10	0.4
Innovative Behavior	162	27	6	.90	.14	0.5
Innovative School Climate	319	77	4.1	.88	.11	0.5
One-factor	18	37	4.9	.64	.12	14
Two-factor	26	88	3	.91	.08	0.5
Three-factor	81	37	2.1	.89	.06	0.5

Note. $N = 259$.

he result as shown on Table 3.4, creative self-efficacy 6-item model fit results indicates acceptable fit for $\chi^2/df = 3.8$, $CFI = .94$, and $SRMR .04$, and $RMSEA = .10$ is over

acceptable value. Innovative behavior 9-item model fit results indicates acceptable fit for SRMR = .05 and CFI = .90, $\chi^2/df = 6$ and RMSEA = .14 is over acceptable value. Innovative school climate 14-item model fit result indicates the acceptable fit for $\chi^2/df = 4.1$ and SRMR = .05, CFI = .88 is little below acceptable fit criterion, and RMSEA = .11 is over acceptable criterion value. Most factor loadings were found to be significant at 0.001 level, however two of creative self-efficacy and one of innovative school climate low factors have been removed from the test during three-factor model test.

In order to test the discriminant validity, one-factor, two-factor, and three-factor models were compared. The one-factor model was constructed by blending all three items; creative self-efficacy, innovative behavior, and innovative school climate. The results for this model fit measures revealed acceptable fit for $\chi^2/df = 4.9$, and poor fit for CFI = .64, RMSEA = .12 and SRMR = .14. The two-factor model was obtained by combining creative self-efficacy and an innovative school climate. The results for this model fit measures revealed acceptable fit for $\chi^2/df = 3$, RMSEA = .91, and SRMR = 0.5, and CFI = .91. The three-factor model was obtained by combining all items; creative self-efficacy, innovative behavior, and innovative school climate. The proposed model fit measures revealed an acceptable fit for $\chi^2/df = 2.1$, RMSEA = .06, and SRMR = 0.5 and CFI = .89 above criterion value. confirming discriminant validity. The fit between model and data is acceptable.

Figure 3.2

Confirmatory Factor Analysis One-Factor

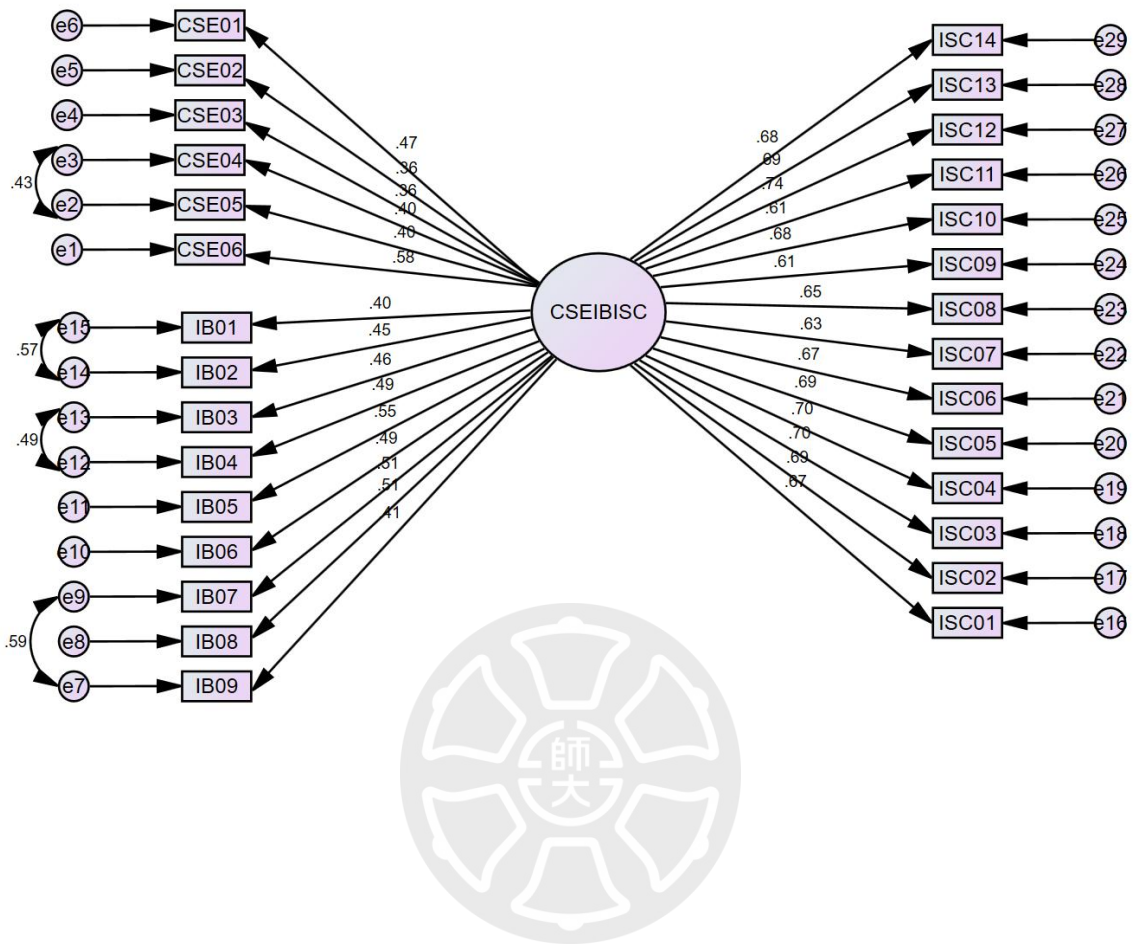


Figure 3.3

Confirmatory Factor Analysis Two-Factor

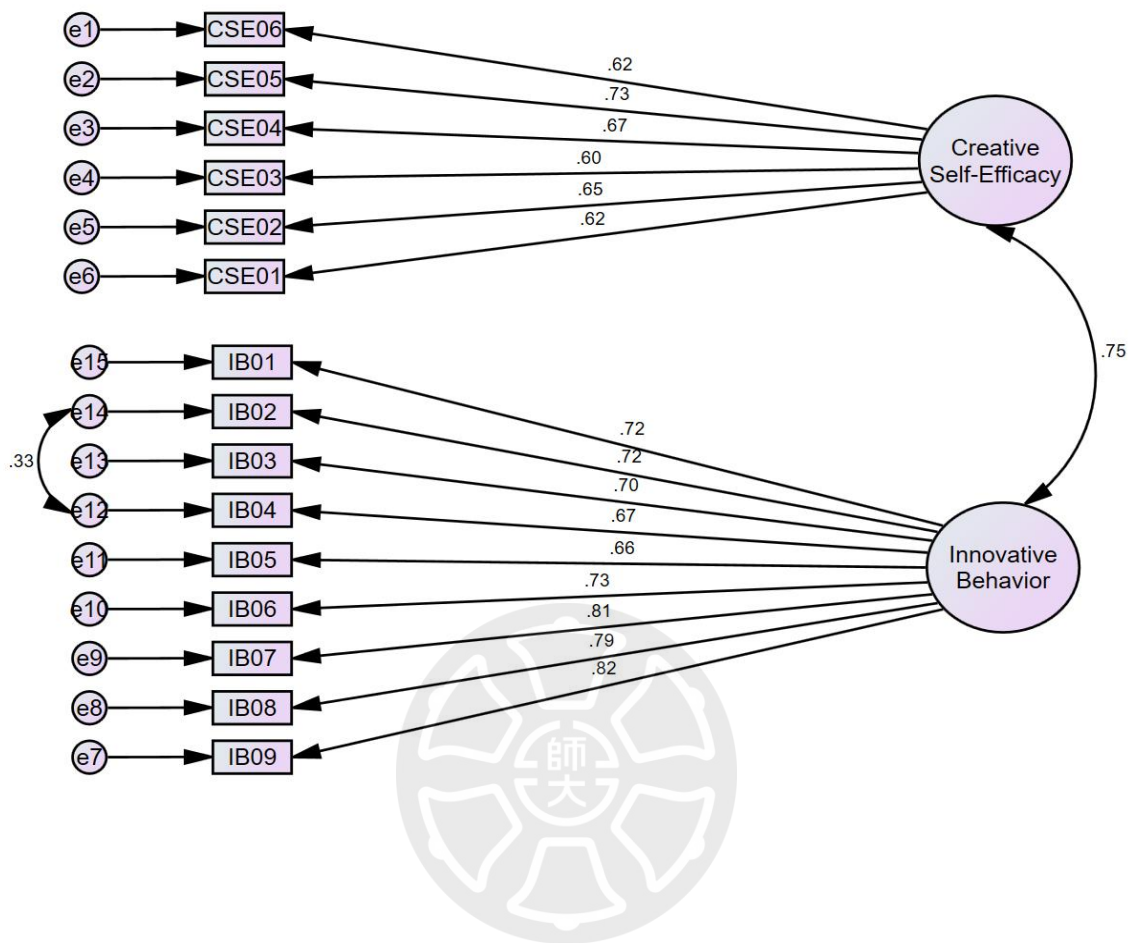
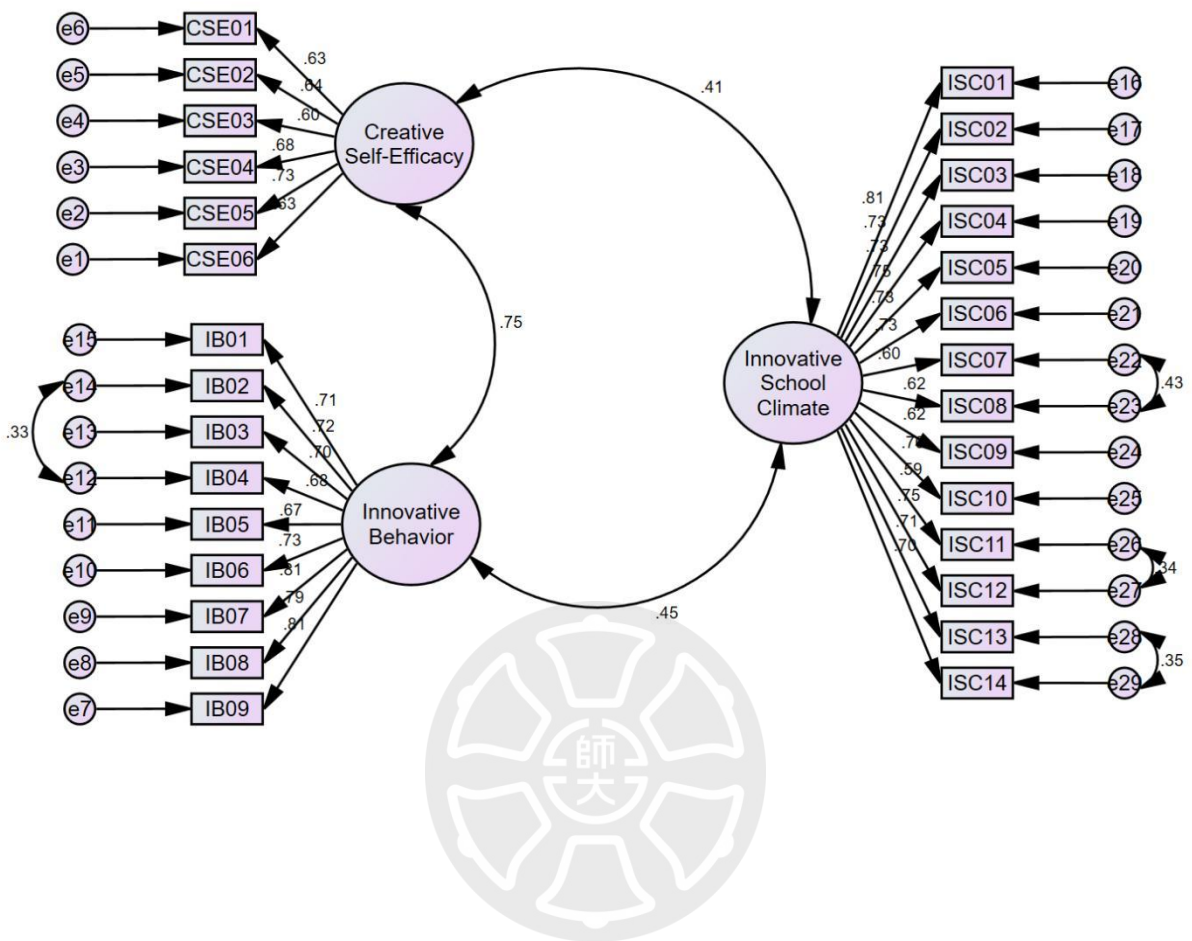


Figure 3.4

Confirmatory Factor Analysis Three-Factor



CHAPTER IV RESULTS AND FINDINGS

Descriptive Statistics

Total of 259 participants of the survey were 203 Taiwanese (78.4%) and 56 foreigners (21.6%) from which 158 females (61%), 100 males (38.6%), and one person from others category (.4%). Most of the participants were undergraduate students ($N = 195$, 75.3%), from age 21 to 25 ($N = 175$, 67.6%), and attended university in average for 1-6 ($N = 226$, 87.3%) semesters.

Table 4.1

Descriptive Statistics (N = 259)

Variable	Value Label	Value	Frequency	Valid Percent	Cumulative Percent
1. Gender	Male	1	100	38.6	38.6
	Female	2	158	61.0	99.6
	Others	3	1	.4	100.0
	Total		259	100.0	
2. Age	under 20	1	29	11.2	11.2
	21-25	2	175	67.6	78.8
	26-30	3	29	11.2	90.0
	31-35	4	19	7.3	97.3
	36-40	5	4	1.5	98.8
	41-45	6	2	.8	99.6
	46-50	7	0	0	0
	51 above	8	1	.4	100.0
	Total		259	100.0	
3. Nationality	Taiwanese	1	203	78.4	78.4
	Non-Taiwanese	2	56	21.6	100.0
	Total		259	100.0	
4. Education	Undergraduate	1	195	75.3	75.3
	Master	2	57	22.0	97.3
	PhD	3	7	2.7	100.0

(continued)

Table 4.1*Descriptive Statistics (N = 259) (continued)*

Variable	Value Label	Value	Frequency	Valid Percent	Cumulative Percent
		Total	259	100.0	
5. Duration of study (in semesters)	1	1	15	5.8	5.8
	2	2	44	17.0	22.8
	3	3	35	13.5	36.3
	4	4	64	24.7	61.0
	5	5	24	9.3	70.3
	6	6	44	17.0	87.3
	7	7	5	1.9	89.2
	8	8	22	8.5	97.7
	9	9	2	.8	98.5
	10	10	2	.8	99.2
	11	11	1	.4	99.6
	12	12	1	.4	100.0
		Total	259	100.0	
6. Major	Arts, Humanities and Languages	1	51	19.7	19.7
	Social sciences, journalism, and information	2	40	15.4	35.1
	Agriculture, forestry, fishery and veterinary medicine	3	4	1.5	36.7
	Information and Communication Technology	4	46	17.8	54.4
	Engineering, manufacturing and construction	5	13	5.0	59.5
	Legal	6	3	1.2	60.6
	Business Administration	7	61	23.6	84.2
	Natural Sciences, Mathematics and Statistics	8	7	2.7	86.9
	Medicine, Health and Social Welfare	9	7	2.7	89.6

(continued)

Table 4.1*Descriptive Statistics (N = 259) (continued)*

Variable	Value Label	Value	Frequency	Valid Percent	Cumulative Percent
	Education	10	9	3.5	93.1
	Services (catering and livelihood services, security services, transportation services)	11	7	2.7	95.8
	Others	12	11	4.2	100.0
		Total	259	100.0	

Data Analysis

Descriptive statistics, reliability and correlation, regression analyses had been conducted in SPSS Statistics 23.

Hypotheses Test Results

Hierarchical regression analysis had been conducted to test the relationship between creative self-efficacy and innovative behavior. Two steps were conducted to examine main and control variables' effects. In the first step, age, education, and nationality were entered as control variables, then creative self-efficacy was entered as the main effect. As shown in Table 4.2 Model 2 indicates $R^2 = .45$, which explains 45% accumulative variance. In Model 2, nationality ($\beta = .30, p < .01$) has a positive significant effect on innovative behavior. Creative self-efficacy has a statistically significant relationship with innovative behavior, as shown in Model 2 ($\beta = 1.1, p < .01$). Thus, Hypothesis 1 was supported.

Table 4.2*Regression Analysis Results for Creative Self-Efficacy Effect*

Variables	Innovative Behavior	
	Model 1	Model 2
Step 1: Controls		
Age	.00	.01
Education	-.05	.04
Nationality	-.04	.30**
Step 2: Main Effect		
Creative Self-Efficacy		1.1**
R^2	.00**	.45**
Adj. R^2	-0.011	.44**
F	.07**	51.9
ΔR^2	.00**	.45**
ΔF	.07**	207

Note. $N = 259$.

* $p < .05$. ** $p < .01$.

Hierarchical regression analysis had been conducted to test the moderating effect of innovative school climate on the relationship between creative self-efficacy and innovative behavior. Three steps were conducted to examine control, main and interaction effects (Baron & Kenny, 1986). In the first step, age, education, and nationality were entered as control variables, in the second step creative self-efficacy and innovative school climate were entered as the main effect, and in the third step, the interaction effect was entered. The interaction effect developed by multiplying creative self-efficacy and innovative school climate.

Table 4.3, Model 3 results indicates incremental variance ($\beta = .33$, $F = 41.2$, $p < .01$, $\Delta R^2 = .01$). Model 3 indicates $R^2 = .49$, which explains 49% accumulative variance. The results indicated that the interaction effect of innovative school climate has a positive significance on creative self-efficacy and innovative behavior relationship. Thus, Hypothesis 2 is supported.

Figure 4.1 demonstrated a simple slope analysis to determine students' innovative behavior with creative self-efficacy in high and low innovative school climates. The interaction was obtained by plotting the estimates plus and minus one standard deviation of

the means of innovative school climate to represent high versus low innovative school climate on creative self-efficacy. The results showed that when innovative school climate is high, students' innovative behavior is higher than when innovative school climate is low.

Table 4.3

Hierarchical Regression Analysis Results for Moderating Effect of Innovative School Climate

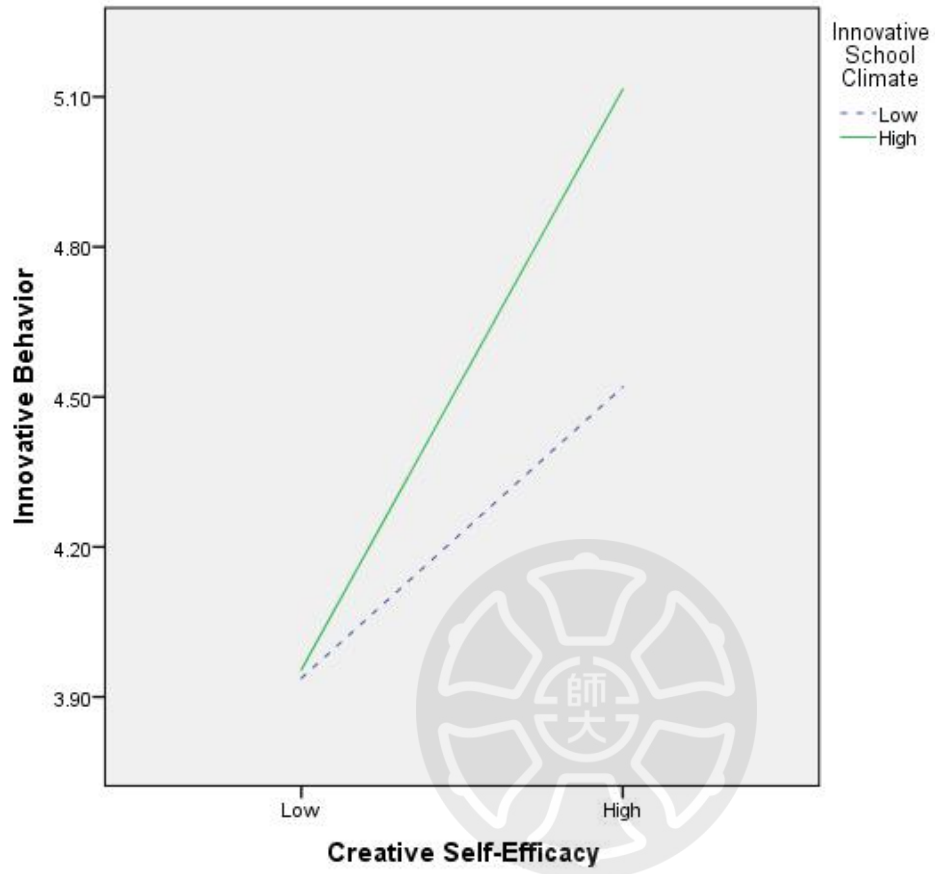
Variables	Innovative Behavior		
	Model 1	Model 2	Model 3
Step 1: Control variables			
Age	.00	.00	-.02
Education	-.05	.09	.13
Nationality	-.04	.18	.18
Step 2: Main effect			
CSE		1.0**	-.25
ISC		0.3**	-.97
Step 3: Interaction			
CSE x ISC			.33**
R^2	.00**	.48**	.50**
$Adj. R^2$	-0.011	.47**	.48**
F	.07**	47	41.2
ΔR^2	.00**	.48**	.01**
ΔF	.07**	117	6.88

Note. $N = 259$. CSE = Creative Self-Efficacy; ISC = Innovative School Climate.

* $p < .05$. ** $p < .01$.

Figure 4.1

Moderating Effect of Innovative School Climate on Creative Self-Efficacy and Innovative Behavior relationship.



CHAPTER V DISCUSSION AND CONCLUSION

Discussion and Conclusion

The first hypothesis of this study was to examine whether university and college students' creative self-efficacy level impacts their innovative behavior. In other words, if students' creative self-efficacy level is high so does their innovative behavior. The Hypothesis 1 result of this study confirmed that when students possess a high level of creative self-efficacy, they do engage in innovative behavior, more than students with a low level of creative self-efficacy. This can be explained as students with high levels of creative self-efficacy are not afraid of difficult assignments and tasks. As a result of they have performed similar tasks many times before and once they get comfortable with the subject, their confidence increases in that area. Thus, it might trigger their curiosity and interest to do the assignments from a different angle, from a creative aspect. Hence, with deeper knowledge and more experience, students' creative self-efficacy level increases. On the contrary, students with a low level of creative self-efficacy, might not feel to be creative and take risks. The reason for this might be a lack of knowledge and experience in that subject, thus they feel insecure to involve in an unknown and unfamiliar activity that requires more knowledge and effort. This may explain why students with a low level of creative self-efficacy do not engage in innovative activities. Thus, the result of this study was consistent with previous studies (Chang & Yang, 2012; Li & Wu, 2011; Tierney & Farmer, 2002, 2011).

The second hypothesis of this study was to investigate whether innovative school climate positively moderates the relationship between students' creative self-efficacy and their innovative behavior, in a way that the relationship is strengthened when the innovative climate is high rather than low. In other words, if a school climate is highly innovative and supports innovation, it increases students' innovative behavior. The result of this study revealed that when innovative school climate is low, students' innovative behavior was lower,

and when innovative school climate is high students' innovative behavior was higher. Thus, Hypothesis 2 result of this study is confirmed. The result confirmed social cognitive theory, that states, personal, behavioral, and environmental factors predict individuals' future behavior. When school climate is innovative, it creates an environment where being creative is a normal activity because students are surrounded by teachers, principals, senior students who are innovative. Moreover, if students are confident about their capabilities in innovation supported climate, such creativity encouraging environment might assist in the production of students' innovative behavior. On the other hand, in non-innovative environments creativity is not promoted and subjects are taught according to curriculum, assignments are recommended to be completed according to the books. In such an environment, creativity is not much supported and appreciated unless the nature of the subject requires creativity.

In overall, an innovative school climate should assure that it is an open-minded safe space where students can express themselves and not feel insecure about their creative ideas and projects. Thus, this proves the point of this hypothesis that creativity takes place when there is an interaction between human and social context (Zhou, 2003) and it can be enhanced through innovative climate (Schneider et al., 1994).

Limitations

There are some limitations to this study. First, the sample data was collected from various universities, so the level of innovative school climate may vary from school to school. Thus, results might have shared method variance.

All the measurements in this study, creative self-efficacy (Karwowski, 2013), innovative behavior (Janssen, 2000), and innovative school climate (Chang & Yang, 2012) were self-reported. However, all three variable instruments' reliability was satisfactory self-evaluation may have common method bias. Some students' evaluation accuracy might be

different than it is because of the misconception of creativity (Lemons, 2010).

Implications

The findings of this study presented that students' creative self-efficacy correlated to their level of innovative behavior. Additionally, innovative school climate moderated the relationship between students' creative self-efficacy and their innovative behavior.

The theoretical contribution of this study was the usage of social cognitive theory to build relationships among variables of this study and helped to explain how creative self-efficacy, innovative behavior, and innovative school climate fit together. As social cognitive theory (Bandura, 1997) states personal, behavioral, and environmental triadic factors impact individuals' future behavior. Additionally, there is a lack of existing literature where innovative school climate had been researched as a moderator with creative self-efficacy and innovative behavior. The next contribution of this research was how social cognitive theory thoroughly suits the sample of the study. As social cognitive theory was an extension of social learning theory, which emphasizes an environment where learning takes place. Thus, collecting data from students in an educational environment was a suitable setting to examine the theory. Moreover, innovative school climate is rarely studied along with social cognitive theory.

The practical contribution brings attention to innovative school climate and highlights its importance of it. Innovation-supported school climate may bring numerous advantages for educational institutions and their students, teachers, and members. Individuals may obtain a creative mindset and habits, approach and learn things from different and new aspects. Moreover, learn to search, generate, and introduce novel ideas and methods and transform those ideas into an application, improve problem-solving skills, and encourage promote innovation throughout the organization. Educational organizations by accepting different

opinions and providing freedom to create new ideas and techniques may in turn give benefits for its sustainability in innovation demanding market. Educational institutions, themselves may gain many other benefits from innovative climates, such as achieving academic goals, competitive advantage, and sustainability in a fast-evolving market, and prepare future talents with an innovative mindset. Innovative mindset and innovative behavior are beneficial and demand as equal as technical and professional skills in the job market. Educational institutions by incorporating innovation in educational programs, courses, and activities inside and outside of the class for school members and students could be beneficial for all areas. There are numerous studies on how creative self-efficacy and innovative behavior were enhanced through training and remain the same after a certain period of time (Mathisen & Bronnick, 2009). This indicates that innovation can be taught and enhanced by providing the climate.



Recommendations

The current study suggests few recommendations for future researches. As one of the previous studies suggested, this study collected data from schools with a diverse population and taken into account a school factor to investigate creativity (Beghetto, 2006). Institutions with diverse populations tend to create a stimulating environment for innovation (Chell & Athayde, 2009). Thus, the sample of this study was collected from schools with a variety of nationality students. Future researchers should conduct multilevel research by collecting data from few different schools. Inquire participants to provide their school names so once sufficient amount of samples collected from each school then perform comparison among those schools. This way may have variance in terms of innovative school climate.

Second, as previously stated, all variable measurements were self-reported, thus using other additional scales might show a difference in the result. Subsequent studies may take

into consideration incorporating peer, parent, or teacher reviews, such cross-reporting may lead to accurate outcomes. A previous study among college students shown that participants had a misconception about creativity (Lemons, 2010).

Another recommendation is to elaborate on the result of this study, investigate different personal, behavioral, and environmental factors basing on Social Cognitive Theory to understand how innovative behavior occurs and what other personal and environmental factors impact creativity.



REFERENCES

- Amabile, T. M. (1988). A model of creativity and innovation in organizations. *Research in Organizational Behavior*, 10(1), 123-167.
- Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, 39(5), 1154-1184.
- Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management*, 40(5), 1297-1333.
- Azim, M. T., Fan, L., Uddin, M. A., Jilani, M. M. A. K., & Begum, S. (2019). Linking transformational leadership with employees' engagement in the creative process. *Management Research Review*, 42(7), pp. 837-858.
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191.
- Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology*, 45(5), 1017.
- Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology*, 4(3), 359-373.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44(9), 1175.
- Bandura, A. (1994). Social cognitive theory and exercise of control over HIV infection. In J. D. Ralph and L. P. John (Eds.), *Preventing AIDS* (pp. 25-59). Springer, Boston, MA.
- Bandura, A. (1997). The anatomy of stages of change. *American Journal of Health Promotion: American Journal of Health Promotion*, 12(1), 8-10.
- Bandura, A. (2001). Social cognitive theory of mass communication. *Media Psychology*, 3(3), 265-299.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173.
- Beghetto, R. A. (2006). Creative self-efficacy: Correlates in middle and secondary students. *Creativity Research Journal*, 18(4), 447-457.
- Beghetto, R. A. (2010). Creativity in the classroom. In J. C. Kaufman & R. J. Sternberg (Eds.), *The Cambridge handbook of creativity* (pp. 447–463). Cambridge University Press.

- Beghetto, R. A. (2016). Creative learning: A fresh look. *Journal of Cognitive Education and Psychology, 15*(1), 6-23.
- Brewer, D., & Tierney, W. G. (2011). Barriers to Innovation in U.S. Higher Education. In B. Wildavsky, & A. Kelly (Eds.), *Reinventing Higher Education* Harvard Education Press.
- Bowen, F. E., Rostami, M., & Steel, P. (2010). Timing is everything: A meta-analysis of the relationships between organizational performance and innovation. *Journal of Business Research, 63*(11), 1179-1185.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing Structural Equation Models* (pp. 136-162). Newbury Park, CA: Sage.
- Bunpin III, J. J. D., Chapman, S., Blegen, M., & Spetz, J. (2016). Differences in innovative behavior among hospital-based registered nurses. *JONA: The Journal of Nursing Administration, 46*(3), 122-127.
- Byrge, C., & Tang, C. (2015). Embodied creativity training: Effects on creative self-efficacy and creative production. *Thinking Skills and Creativity, 16*, 51-61.
- Carmeli, A., & Weisberg, J. (2006). Exploring turnover intentions among three professional groups of employees. *Human Resource Development International, 9*(2), 191-206.
- Carmines, E. G., & McIver, J. P. (1981). Analyzing models with unobserved variables: Analysis of covariance structure. In G. W. Bohrnstedt, & E. F. Borgatta (Eds.), *Social measurement: Current issues* (pp. 65-115). Beverly Hills, CA: Sage.
- Carlson, R.O. (1965) *Adoption of Educational Innovations*. The Center for the Advanced Study of Educational Administration, University of Oregon Press.
- Chambliss, C. A., & Murray, E. J. (1979). Efficacy attribution, locus of control, and weight loss. *Cognitive Therapy and Research, 3*(4), 349-353.
- Chang, C. P., Chuang, H. W., & Bennington, L. (2011). Organizational climate for innovation and creative teaching in urban and rural schools. *Quality & Quantity, 45*(4), 935-951.
- Chang, J. C., & Yang, Y. L. (2012). The effect of organization's innovational climate on student's creative self-efficacy and innovative behavior. *Business & Entrepreneurship Journal, 1*(1), 75-100.
- Chang, Y. C. (2018). Analyzing the moderating effect of knowledge innovation of tourism and hospitality department teachers on student creative self-efficacy and innovation behaviors by using hierarchical linear modeling. *Cogent Education, 5*(1), 1535755.
- Chell, E., & Athayde, R. (2009). *The identification and measurement of innovative characteristics of young people: Development of the youth innovation skills measurement tool*. Kingston University Research Repository.

- Chin, C. M. (1997). *Educational Administration: Theory*. Taipei: Wu Nan.
- Choi, J. N. (2004). Individual and contextual predictors of creative performance: The mediating role of psychological processes. *Creativity Research Journal*, 16(2-3), 187-199.
- Chong, E., & Ma, X. (2010). The influence of individual factors, supervision and work environment on creative self-efficacy. *Creativity and Innovation Management*, 19(3), 233-247.
- Cohen-Meitar, R., Carmeli, A., & Waldman, D. A. (2009). Linking meaningfulness in the workplace to employee creativity: The intervening role of organizational identification and positive psychological experiences. *Creativity Research Journal*, 21(4), 361-375.
- Chou, C. M., Hsiao, H. C., Shen, C. H., & Chen, S. C. (2010). Analysis of Factors in Technological and Vocational School Teachers' Perceived Organizational Innovative Climate and Continuous Use of E-Teaching: Using Computer Self-Efficacy as an Intervening Variable. *Turkish Online Journal of Educational Technology-TOJET*, 9(4), 35-48.
- Chou, C. M., Shen, C. H., Hsiao, H. C., & Shen, T. C. (2019). Factors influencing teachers' innovative teaching behaviour with information and communication technology (ICT): the mediator role of organizational innovation climate. *Educational Psychology*, 39(1), 65-85.
- Cummings, T. G., & Worley, C. G. (2008). *Organization development and change: 9th Edition*. Cincinnati: OH South western college publishing.
- Daft, R. L., & Becker, S. W. (1978). School District Size and the Deployment of Personnel Resources. *Alberta Journal of Educational Research*, 24(3), 173-87.
- Dhar, R. L. (2015). The effects of high performance human resource practices on service innovative behaviour. *International Journal of Hospitality Management*, 51, 67-75.
- De Spiegelaere, S., Van Gyes, G., De Witte, H., Niesen, W., & Van Hootegem, G. (2014). On the relation of job insecurity, job autonomy, innovative work behaviour and the mediating effect of work engagement. *Creativity and Innovation Management*, 23(3), 318-330.
- Fan, H. L., Chang, P. F., Albanese, D., Wu, J. J., Yu, M. J., & Chuang, H. J. (2016). Multilevel influences of transactive memory systems on individual innovative behavior and team innovation. *Thinking Skills and Creativity*, 19, 49-59.
- Ford, C. M. (1996). A theory of individual creative action in multiple social domains. *Academy of Management Review*, 21(4), 1112-1142.
- Getz, I., & Robinson, A. G. (2003). Innovate or die: is that a fact?. *Creativity and Innovation Management*, 12(3), 130-136.
- Gist, M. E. 1989. The influence of training method on self-efficacy and idea generation among managers. *Personal Psychology*, 42, 787-805.

- Gist, M. E., & Mitchell, T. R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review*, 17(2), 183-211.
- Gong, Y., Huang, J. C., & Farh, J. L. (2009). Employee learning orientation, transformational leadership, and employee creativity: The mediating role of employee creative self-efficacy. *Academy of Management Journal*, 52(4), 765-778.
- Hansen, K. H. (1967). Planning for changes in education. Morphet, EL & Ryan, C. O.(Eds.), *Planning and effecting needed changes in education*, 29-34.
- Haines-Gadd, L. (2015). Does TRIZ change people? Evaluating the impact of TRIZ training within an organisation: Implications for theory and practice. *Procedia Engineering*, 131, 259-269.
- Houghton, J. D., & DiLiello, T. C. (2010). Leadership development: The key to unlocking individual creativity in organizations. *Leadership & Organization Development Journal*, 31(3), 230–245.
- Hoy, W. K., & Miskel, C. G. (2005). Theory, research, and practice. *Educational administration: 9th Edition*, 471.
- Hoffman, A., & Holzhter, J. (2012). The evolution of higher education: innovation as natural selection. *Innovation in Higher Education: Igniting the Spark for Success*, American Council on Education, Rowman & Littlefield Publishers Inc.
- Hsiao, H. C., Chang, J. C., Tu, Y. L., & Chen, S. C. (2011). The impact of self-efficacy on innovative work behavior for teachers. *International Journal of Social Science and Humanity*, 1(1), 31.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: a Multidisciplinary Journal*, 6(1), 1-55.
- Huang, H. Y., & Hung, S. P. (2009). A study of examining construct validity on the scale of creative self-efficacy for students through both linear and nonlinear approaches. *Journal of Pingtung University of Education*, 33, 489-513.
- Hung, S. P., Huang, H. Y., & Lin, S. S. (2008). Do significant others' feedback influence one's creative behavior?—Using structural equation modeling to examine creativity self-efficacy and creativity motivation mediation effect. *Bulletin of Educational Psychology*, 40(2), 303–322.
- Hennessey, B.A. and Amabile, T.M. (2010). *Creativity. Annual Review of Psychology*, 61, 569-598.
- Hunter, S. T., Bedell, K. E., & Mumford, M. D. (2007). Climate for creativity: A quantitative review. *Creativity Research Journal*, 19(1), 69-90.
- Hsu, M. L., & Chen, F. H. (2017). The cross-level mediating effect of psychological capital on the organizational innovation climate–employee innovative behavior relationship. *The*

Journal of Creative Behavior, 51(2), 128-139.

- Hsu, M. L., & Fan, H. L. (2010). Organizational innovation climate and creative outcomes: Exploring the moderating effect of time pressure. *Creativity Research Journal*, 22(4), 378-386.
- Jaiswal, N. K., & Dhar, R. L. (2015). Transformational leadership, innovation climate, creative self-efficacy and employee creativity: A multilevel study. *International Journal of Hospitality Management*, 51, 30-41.
- James, L. R., Hartman, A., Stebbins, M. W., & Jones, A. P. (1977). Relationships between psychological climate and a vie model for work motivation¹. *Personnel Psychology*, 30(2), 229-254.
- Janssen, O. (2000). Job demands, perceptions of effort-reward fairness and innovative work behaviour. *Journal of Occupational and Organizational Psychology*, 73(3), 287-302.
- Janssen, O., Van de Vliert, E., & West, M. (2004). The bright and dark sides of individual and group innovation: A special issue introduction. *Journal of Organizational Behavior*, 25(2), 129-145.
- Jaiswal, N. K., & Dhar, R. L. (2015). Transformational leadership, innovation climate, creative self-efficacy and employee creativity: A multilevel study. *International Journal of Hospitality Management*, 51, 30-41.
- Jiang, W., & Gu, Q. (2017). Leader creativity expectations motivate employee creativity: A moderated mediation examination. *The International Journal of Human Resource Management*, 28(5), 724-749.
- Jauss, K. S., Randel, A. E., & Dionne, S. D. (2007). I am, I think I can, and I do: The role of personal identity, self-efficacy, and cross-application of experiences in creativity at work. *Creativity Research Journal*, 19(2-3), 247-258.
- Johnson, B., & Stevens, J. J. (2006). Student achievement and elementary teachers' perceptions of school climate. *Learning Environments Research*, 9(2), 111-122.
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31-36.
- Kanter, R. M. (1983). *The change masters: Innovation for productivity in the American corporation*. Simon and Schuster.
- Kanter, R. M. (1988). Three tiers for innovation research. *Communication Research*, 15(5), 509-523.
- Karwowski, M., & Soszynski, M. (2008). How to develop creative imagination? Assumptions, aims and effectiveness of role play training in creativity (RPTC). *Thinking Skills and Creativity*, 3(2), 163-171.
- Karwowski, M. (2011). It doesn't hurt to ask... But sometimes it hurts to believe: Polish students' creative self-efficacy and its predictors. *Psychology of Aesthetics, Creativity, and the*

Arts, 5(2), 154.

- Karwowski, M., Lebuda, I., Wisniewska, E., & Gralewski, J. (2013). Big five personality traits as the predictors of creative self-efficacy and creative personal identity: Does gender matter? *The Journal of Creative Behavior*, 47(3), 215-232.
- Karwowski, M., Gralewski, J., & Szumski, G. (2015). Teachers' effect on students' creative self-beliefs is moderated by students' gender. *Learning and Individual Differences*, 44, 1-8.
- Kermani, Z. J., & Solhdoost, F. (2016). Relationship between innovation climate and innovative behavior of librarians: Case study in organization of libraries, museums and documentation center of astan quds razavi. *International Journal of Information Science and Management (IJISM)*, 15(1).
- King, E. B., De Chermont, K., West, M., Dawson, J. F., & Hebl, M. R. (2007). How innovation can alleviate negative consequences of demanding work contexts: The influence of climate for innovation on organizational outcomes. *Journal of Occupational and Organizational Psychology*, 80(4), 631-645.
- Kwon Choi, B., Koo Moon, H., & Ko, W. (2013). An organization's ethical climate, innovation, and performance. *Management Decision*, 51(6), 1250-1275.
- Lemons, G. (2010). Bar drinks, rugas, and gay pride parades: Is creative behavior a function of creative self-efficacy? *Creativity Research Journal*, 22(2), 151-161.
- Li, Z., Zhu, T., & Luo, F. (2010). A study on the Influence of organizational climate on knowledge-sharing behavior in IT enterprises. *J. Comput.*, 5(4), 508-515.
- Li, C. H., & Wu, J. J. (2011). The structural relationships between optimism and innovative behavior: Understanding potential antecedents and mediating effects. *Creativity Research Journal*, 23(2), 119-128.
- Liu, F., Chow, I. H. S., Zhang, J. C., & Huang, M. (2019). Organizational innovation climate and individual innovative behavior: Exploring the moderating effects of psychological ownership and psychological empowerment. *Review of Managerial Science*, 13(4), 771-789.
- Locke, E. A., Frederick, E., Lee, C., & Bobko, P. (1984). Effect of self-efficacy, goals, and task strategies on task performance. *Journal of Applied Psychology*, 69, 241-251.
- Luo, Y., Cao, Z., Yin, L., Zhang, H., & Wang, Z. (2018). Relationship between extraversion and employees' innovative behavior and moderating effect of organizational innovative climate. *NeuroQuantology* 16(6), 186-194.
- Lundvall, B. A. (2008). Higher education, innovation and economic development. *Higher Education and Development*, 8, 201-228.
- Maddux, J.E. (2009). Self-efficacy: The power of believing you can. In S.J. Lopez & Cr. R. Snyder (Eds.), *Handbook of positive psychology*. (pp. 335-344). New York: Oxford

University Press.

- Marsh, H. W., & Hocevar, D. (1985). Application of confirmatory factor analysis to the study of self-concept: First-and higher order factor models and their invariance across groups. *Psychological Bulletin*, 97(3), 562.
- Mathisen, G. E., & Bronnick, K. S. (2009). Creative self-efficacy: An intervention study. *International Journal of Educational Research*, 48(1), 21-29.
- Mathisen, G. E. (2011). Organizational antecedents of creative self-efficacy. *Creativity and Innovation Management*, 20(3), 185-195.
- Malik, M. A. R., Butt, A. N., & Choi, J. N. (2015). Rewards and employee creative performance: Moderating effects of creative self-efficacy, reward importance, and locus of control. *Journal of Organizational Behavior*, 36(1), 59-74.
- Maranville, S. (1992). Entrepreneurship in the business curriculum. *Journal of Education for Business*, 68(1), 27-31.
- Marcum, R. L. (1968). *Organizational climate and the adoption of educational innovation*. Utah State University.
- McDonald, R. P., & Ho, M. H. R. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods*, 7(1), 64.
- McEvoy, A., & Welker, R. (2000). Antisocial behavior, academic failure, and school climate: A critical review. *Journal of Emotional and Behavioral Disorders*, 8(3), 130-140.
- McCharen, B., Song, J., & Martens, J. (2011). School innovation: The mutual impacts of organizational learning and creativity. *Educational Management Administration & Leadership*, 39(6), 676-694.
- McRoy, I., & Gibbs, P. (2009). Leading change in higher education. *Educational Management Administration & Leadership*, 37(5), 687-704.
- Michinov, N., & Michinov, E. (2009). Investigating the relationship between transactive memory and performance in collaborative learning. *Learning and Instruction*, 19(1), 43-54.
- Michael, L. H., Hou, S. T., & Fan, H. L. (2011). Creative self-efficacy and innovative behavior in a service setting: Optimism as a moderator. *The Journal of Creative Behavior*, 45(4), 258-272.
- Moolenaar, N. M., Daly, A. J., & Slegers, P. J. (2010). Occupying the principal position: Examining relationships between transformational leadership, social network position, and schools' innovative climate. *Educational Administration Quarterly*, 46(5), 623-670.
- Moon, H. K., & Choi, B. K. (2014). How an organization's ethical climate contributes to customer satisfaction and financial performance. *European Journal of Innovation Management*, 1, 85-106.

- Montani, F., Courcy, F., & Vandenberghe, C. (2017). Innovating under stress: The role of commitment and leader-member exchange. *Journal of Business Research*, 77, 1-13.
- Mueller, J., Wood, E., Willoughby, T., Ross, C., & Specht, J. (2008). Identifying discriminating variables between teachers who fully integrate computers and teachers with limited integration. *Computers & Education*, 51(4), 1523-1537.
- Mumford, M. D. (2000). Managing creative people: Strategies and tactics for innovation. *Human Resource Management Review*, 10(3), 313-351.
- Newman, A., Herman, H. M., Schwarz, G., & Nielsen, I. (2018). The effects of employees' creative self-efficacy on innovative behavior: The role of entrepreneurial leadership. *Journal of Business Research*, 89, 1-9.
- Noefer, K., Stegmaier, R., Molter, B., & Sonntag, K. (2009). A great many things to do and not a minute to spare: Can feedback from supervisors moderate the relationship between skill variety, time pressure, and employees' innovative behavior?. *Creativity Research Journal*, 21(4), 384-393.
- Nunnally, J. C. (1978). *Psychometric Theory: 2nd Edition*. McGraw-Hill.
- Oliveira, R., Pedro, M. I., & Marques, R. C. (2013). Efficiency and its determinants in Portuguese hotels in the Algarve. *Tourism Management*, 36, 641-649.
- Osolind, K. (2012), "Revolutionary vs evolutionary innovation", *Reinvention Consulting*. www.reinventioninc.com/revolutionvsevolution (accessed October 16, 2016).
- Park, S., & Jo, S. J. (2018). The impact of proactivity, leader-member exchange, and climate for innovation on innovative behavior in the Korean government sector. *Leadership & Organization Development Journal*, 39(1), 130-149.
- Parker, S. K., Williams, H. M., & Turner, N. (2006). Modeling the antecedents of proactive behavior at work. *Journal of Applied Psychology*, 91(3), 636.
- Patterson, F., Kerrin, M., Gatto-Roissard, G., & Coan, P. (2009). *Everyday innovation: How to enhance innovative working in employees and organisations*. London: NESTA.
- Parzefall, M. R., Seeck, H., & Leppänen, A. (2008). Employee innovativeness in organizations: a review of the antecedents. *Finnish Journal of Business Economics*, 2(08), 165-182.
- Patterson, M. G., West, M. A., Shackleton, V. J., Dawson, J. F., Lawthom, R., Maitlis, S., ... & Wallace, A. M. (2005). Validating the organizational climate measure: links to managerial practices, productivity and innovation. *Journal of Organizational Behavior*, 26(4), 379-408.
- Peng, Y. (2016). A Study of the Relationship among Leader-member Exchange, Creative the University Librarians. *Journal of Educational Media and Library Science*, 53(1), 27-61.
- Pieterse, A. N., Van Knippenberg, D., Schippers, M., & Stam, D. (2010). Transformational and transactional leadership and innovative behavior: The moderating role of psychological

- empowerment. *Journal of Organizational Behavior*, 31(4), 609-623.
- Puente-Díaz, R. (2016). Creative self-efficacy: An exploration of its antecedents, consequences, and applied implications. *The Journal of Psychology*, 150(2), 175-195.
- Puente-Díaz, R., & Cavazos-Arroyo, J. (2017). Creative self-efficacy: the role of self-regulation for schoolwork and boredom as antecedents, and divergent thinking as a consequence. *Social Psychology of Education*, 20(2), 347-359.
- Pundt, A. (2015). The relationship between humorous leadership and innovative behavior. *Journal of Managerial Psychology*, 30(8).
- Renko, M., El Tarabishy, A., Carsrud, A. L., & Brännback, M. (2015). Understanding and measuring entrepreneurial leadership style. *Journal of Small Business Management*, 53(1), 54-74.
- Ren, F., & Zhang, J. (2015). Job stressors, organizational innovation climate, and employees' innovative behavior. *Creativity Research Journal*, 27(1), 16-23.
- Richter, A. W., Hirst, G., Van Knippenberg, D., & Baer, M. (2012). Creative self-efficacy and individual creativity in team contexts: Cross-level interactions with team informational resources. *Journal of Applied Psychology*, 97(6), 1282.
- Robbins, T. L., & Kegley, K. (2010). Playing with Thinkertoys to build creative abilities through online instruction. *Thinking Skills and Creativity*, 5(1), 40-48.
- Rose, L. H., & Lin, H. T. (1984). A meta-analysis of long-term creativity training programs. *The Journal of Creative Behavior*, 18(1), 11-22.
- Ross, Donald H. 1958. *Administration for Adaptability*, Rev. Ed. Metropolitan School Study Council, New York. pp. 458-460.
- Saleh, S. D., & Wang, C. K. (1993). The management of innovation: strategy, structure, and organizational climate. *IEEE Transactions on Engineering Management*, 40(1), 14-21.
- Siegel, S. M., & Kaemmerer, W. F. (1978). Measuring the perceived support for innovation in organizations. *Journal of Applied Psychology*, 63(5), 553.
- Shanker, R., Bhanugopan, R., Van der Heijden, B. I., & Farrell, M. (2017). Organizational climate for innovation and organizational performance: The mediating effect of innovative work behavior. *Journal of Vocational Behavior*, 100, 67-77.
- Schneider, B., Gunnarson, S. K., & Niles-Jolly, K. (1994). Creating the climate and culture of success. *Organizational Dynamics*, 23(1), 17-29.
- Shiu, S. C., Lin, S. Y., & Chien, H. O. (2012). The relationship between learning motivation and innovative behavior in the university students: From the perspective of creative self-efficacy. *International Journal of Arts & Sciences*, 5(5), 33.
- Song, J. H., Kim, W., Chai, D. S., & Bae, S. H. (2014). The impact of an innovative school

climate on teachers' knowledge creation activities in Korean schools: The mediating role of teachers' knowledge sharing and work engagement. *KEDI Journal of Educational Policy*, 11(2).

- Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37(3), 580-607.
- Scott, G., Leritz, L. E., & Mumford, M. D. (2004). The effectiveness of creativity training: A quantitative review. *Creativity Research Journal*, 16(4), 361-388.
- Shalley, C. E., & Gilson, L. L. (2004). What leaders need to know: A review of social and contextual factors that can foster or hinder creativity. *The Leadership Quarterly*, 15(1), 33-53.
- Schleicher, A. (2012). *Preparing teachers and developing school leaders for the 21st century: Lessons from around the world*. OECD Publishing.
- Stajkovic, A. D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin*, 124(2), 240.
- Teng, C. C., Hu, C. M., & Chang, J. H. (2020). Triggering creative self-efficacy to increase employee innovation behavior in the hospitality workplace. *The Journal of Creative Behavior*, 54(4), 912-925.
- Tsai, C. Y., Horng, J. S., Liu, C. H., & Hu, D. C. (2015). Work environment and atmosphere: The role of organizational support in the creativity performance of tourism and hospitality organizations. *International Journal of Hospitality Management*, 46, 26-35.
- Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal*, 45(6), 1137-1148.
- Tierney, P., & Farmer, S. M. (2004). The Pygmalion process and employee creativity. *Journal of Management*, 30(3), 413-432.
- Tierney, P., & Farmer, S. M. (2011). Creative self-efficacy development and creative performance over time. *Journal of Applied Psychology*, 96(2), 277.
- Torrance, E. P. (1972). Can we teach children to think creatively? *Journal of Creative Behavior*, 6, 114-143.
- Tubin, D. (2009). Planning an innovative school: How to reduce the likelihood of regression toward the mean. *Educational Management Administration & Leadership*, 37(3), 404-421.
- Tushman, M., & Nadler, D. (1986). Organizing for innovation. *California Management Review*, 28(3), 74-92.
- Wildavsky, B., Kelly, A. P., & Carey, K. (Eds.). (2011). *Reinventing higher education: The*

promise of innovation. Harvard Education Press.

- Wang, C. J., Tsai, H. T., & Tsai, M. T. (2014). Linking transformational leadership and employee creativity in the hospitality industry: The influences of creative role identity, creative self-efficacy, and job complexity. *Tourism Management, 40*, 79-89.
- West, M. A. (1990). The social psychology of innovation in groups. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 309–333). John Wiley & Sons.
- West, M. A. (2002). Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups. *Applied Psychology, 51*(3), 355-387.
- Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of Management Review, 18*(2), 293-321.
- Vickers, N. J. (2017). Animal communication: when I'm calling you, will you answer too?. *Current Biology, 27*(14), R713-R715.
- Xerri, M. J., & Brunetto, Y. (2013). Fostering innovative behaviour: The importance of employee commitment and organisational citizenship behaviour. *The International Journal of Human Resource Management, 24*(16), 3163-3177.
- Yu, M. C., Mai, Q., Tsai, S. B., & Dai, Y. (2018). An empirical study on the organizational trust, employee-organization relationship and innovative behavior from the integrated perspective of social exchange and organizational sustainability. *Sustainability, 10*(3), 864.
- Yu, C., Yu, T. F., & Yu, C. C. (2013). Knowledge sharing, organizational climate, and innovative behavior: A cross-level analysis of effects. *Social Behavior and Personality: An International Journal, 41*(1), 143-156.
- Yuan, F., & Woodman, R. W. (2010). Innovative behavior in the workplace: The role of performance and image outcome expectations. *Academy of Management Journal, 53*(2), 323-342.
- Zhang, Z., Wang, M. O., & Shi, J. (2012). Leader-follower congruence in proactive personality and work outcomes: The mediating role of leader-member exchange. *Academy of Management Journal, 55*(1), 111-130.
- Zhang, X., & 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), 107-128.
- Zhang, Y., Zheng, J., & Darko, A. (2018). How does transformational leadership promote innovation in construction? The mediating role of innovation climate and the multilevel moderation role of project requirements. *Sustainability, 10*(5), 1506.
- Zhou, J. (2003). When the presence of creative coworkers is related to creativity: role of supervisor close monitoring, developmental feedback, and creative personality. *Journal of*

Applied Psychology, 88(3), 413.

Zhou, A., Liu, Y., Su, X., & Xu, H. (2019). Gossip fiercer than a tiger: Effect of workplace negative gossip on targeted employees' innovative behavior. *Social Behavior and Personality: An International Journal*, 47(5), 1-11.

Zhou, J., & Shalley, C. E. (2003). Research on employee creativity: A critical review and directions for future research. *Research in Personnel and Human Resources Management*, 22, 165-217.



APPENDIX A: QUESTIONNAIRE

Students' behavior in school environment

學生在學校環境中的行為。

Dear participant,
親愛的參與者:

Thank you for taking the time to fill this survey in your busy schedule. The purpose of this survey is to study students' behavior at school. Specifically, related to class activities, assignments and other activities at school.

感謝您在繁忙中抽出寶貴時間填寫此調查表。這項調查的目的是研究學生在學校裡的行為。具體來說，是與課堂活動、作業和學校的其他活動等有關的行為。

I will truly appreciate if you show your support by completing this survey. Your information and responses will be strictly confidential and will be used only for this research. Your contribution for this study will be highly valued. Thank you for your time and support.

感謝您的支持與協助來完成這項調查，再次感謝您。您的訊息和回答將受嚴格的保密，而且僅限用於這項研究。你對本項研究的貢獻將受到高度重視。謝謝您的時間和支持。

Graduate Institute of International Human Resource Development,
National Taiwan Normal University
Advisor: Dr. Yi-Chun Lin
Student: Solongo Myagmarjav

Screening questions:

問題內容:

1. Are you currently enrolled student in an university? NO YES

If your answer is YES, please continue the survey.

您目前正在大學就讀中嗎? 否 是

如果您的回答是“是”，請繼續進行調查

2. Are you an exchange student? NO YES

If your answer is NO, please continue the survey.

你是國際交換學生嗎? 否 是

如果您的回答為“否”，請繼續進行調查。

Part 1: Student's Creative Self-Efficacy-6 items (5-points-Likert scale)

第 1 部分：

No.	Please read carefully and rate level of each expressions that applies to you by using scale from 1=definitely not to 5=definitely yes. 請仔細的閱讀，並依據每項描述符合您的程度從 1 到 5 給予評分。	1 = definitely not 絕對不是	2 = no 否	3 = neutral 中立	4 = yes 是	5 = definitely yes 肯定是
1	I know I can efficiently solve even complicated problems. 我知道我能有效地解決一些複雜的問題。					
2	I trust my creative abilities. 我相信你的創作能力。					
3	Compared to my friends, I am distinguished by my imagination and ingenuity. 與朋友相比，我的想像力和才智突出。					
4	Many times, I have proved that I can cope with difficult situations. 很多時候，我證明自己都能應付困難的局面。					
5	I am sure I can deal with problems requiring creative thinking. 我相信我能處理需要創造性思維的問題。					
6	I am good at proposing original solutions to problems. 我善於提供解決問題的基本方案。					

Part 2: Student's Innovative Behavior-9 items (7-points-Likert scale)

第 2 部分：

No.	Please read carefully and rate how often have you done each of the following behaviors by using scale from 1=never to 7=always. 請仔細的閱讀，並依據每項描述符合您的程度從 1 到 7 給予評分。	1=never 從不	2=rarely 很少	3=once in a while 一次	4=sometimes 有時	5=often 經常	6=usually 通常	7=always 總是
7	I create new ideas for difficult issues. 我能提出創新的方法來解決困難的議題。							

8	I search out new studying methods, techniques, or ways. 我能在研究過程提出新的方法、技術或途徑。							
9	I generate original solutions for problems. 我能針對問題提出創新的解答。							
10	I mobilize support for innovative ideas. 我用行動支持創新的想法。							
11	I get approval for innovative ideas from my teacher. 我能說服師長支持我的創新提議。							
12	I make my classmates enthusiastic about innovative ideas. 我能促使同學熱忱的參與創新。							
13	I transform innovative ideas into useful applications. 我將各種創新方案轉換為有價值的應用。							
14	I introduce innovative ideas in class. 我在課堂活動中經常會加入許多創新的構想。							
15	I evaluate the utility of innovative ideas. 我能將創新的構想,轉換成實際有用的成果。							

Part 3: Innovative School Climate-15 items (5-points-Likert scale)

第3部分:

No.	Please read carefully and rate your agreement or disagreement on the following statements, by using scale from 1=strongly disagree to 5=strongly agree. 請仔細的閱讀並在以下陳述中針對對您的同意或不同意程度進行評分, 評分範圍為1到5。1是非常不同意, 5是完全同意。	1 = strongly disagree 非常不同	2 = disagree 不同意	3 = neutral 中立	4 = agree 同意	5 = strongly agree 完全同意
16	This school have freedom to be creative. 本校裡可以自由發揮創意。					
17	Breakthroughs and innovations are the characteristics of our school. 突破與創新是本校的特色。					
18	Our school support creative solutions, even if resources are limited. 即使資源有限,本校仍會支持創意的方案。					
19	The school often encourages students to try to solve problems in creative and novel ways. 校方常鼓勵學生嘗試用創意、新穎的方式解決問題。					

20	I think our school can accept different opinions. 我覺得本校能夠接納意見不同的聲音。					
21	Whether students' creative ideas are accepted or not, they can be recognized by the school. 學生提出的創意想法不論被接納與否,都能得到校方肯定。					
22	I often feel that teachers care about me. 我經常感受到老師對我的關心。					
23	My teacher always gives me credit for my performance. 老師對我的表現常給予肯定與讚美。					
24	I often feel my teacher's friendliness and kindness. 我經常感受到老師的友善與親切。					
25	The teacher will guide me to look at "old problems" from "new concepts". 老師會引導我從「新觀念」看「舊問題」。					
26	When the event of facing problems, the teacher will give enough flexibility and freedom to help solve the problem. 在活動籌辦面臨問題時,師長會給予足夠的彈性與自由度協助解決。					
27	I can freely use the relevant equipment of this school. 我能自由使用本校的相關設備。					
28	I can get sufficient information from this school to complete the assignment. 我可以由本校獲得充分的資訊以完成作業。					
29	My school offers innovative courses to meet my needs. 本校開設創新課程能滿足我的需求。					
30	The school's innovative counseling system can provide consulting services. 本校的創新輔導機制可提供諮詢服務。					

Respondent's Information:

Gender:	Male	Female	Other
Age:	under 20	20-25	26-30
	36-40	41-45	46-50
			31-35
			50 above
Nationality:	Taiwanese	Foreigner	
What is your current enrolled degree?	Undergraduate	Graduate	PhD

How many semesters have you been studying in this university?		
Which of the following best describes your "current" major?		
Arts, Humanities and Languages	Engineering, manufacturing and construction	Medicine, Health and Social Welfare
Social sciences, journalism, and information	Legal	Education
Agriculture, forestry, fishery and veterinary medicine	Business Administration	Services (catering and livelihood services, security services, transportation services)
Information and Communication Technology	Natural Sciences, Mathematics and Statistics	Other (please specify)

受訪者的基本資料:

性別:	男性	女性	其他	
年齡:	20 以下	20-25	26-30	31-35
	36-40	41-45	46-50	50 以上
國籍:	台灣	外藉		
請問你目前就讀的階段?	大學本科	研究生(碩士)	博士	
你在本校已就讀幾個學期?				
請問下列何者最能描述您「目前」的主修學類?				
藝術、人文 及語文	工程、製造及營建	醫藥衛生及社會福利		
社會科學、新聞學及圖書資訊	法律類	教育類		
農業、林業、漁業及獸醫	商業、管理	服務 (餐旅及民生服務、安全服務、運輸服務)		
資訊通訊科技	自然科學、數學及統計	其他 (請註明)		

Thank you for your time and contribution.
感謝您的撥冗和參與。

