An Organization Development Intervention to Improve Teacher Innovative Behavior in School of Management - A Case Study of Zhanjiang University of Science and Technology

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Abstract

University teachers' innovative actions significantly contribute to the development of students' creative abilities and directly impact educational outcomes, research quality, and student growth. This study aims to improve the current state of creative self-efficacy, job autonomy, knowledge sharing, perceived organizational support, and teacher innovative behavior. The study also aims to design and implement practical Organization Development Interventions to foster teacher innovation. It examines the changes in teacher innovative behavior before and after the ODIs, as well as investigates the interconnections among creative self-efficacy, job autonomy, knowledge sharing, perceived organizational support, and teacher innovative behavior. A mixed research method was employed, with 70 full-time teachers from Zhanjiang University of Science and Technology's School of Management serving as the sample for a four-month intervention. The research utilized both questionnaires and interviews as data collection instruments. The analysis revealed significant differences between Pre-ODI and Post-ODI in both independent variables (creative self-efficacy, job autonomy, knowledge sharing, perceived organizational support) and the dependent variable (teacher innovative behavior). The data analysis results corroborate the existence of positive relationships between creative self-efficacy, job autonomy, knowledge sharing, perceived organizational support, and their influence on fostering teacher innovative behavior. The study revealed the impact of elements such as innovative self-efficacy and job autonomy on the innovative behaviors of university teachers, while also testifying that such behaviors can be effectively enhanced through rationally designed Organizational Development Interventions (ODI). The findings offer valuable insights for research in areas including higher education administration, policy formulation for teacher development, and the optimization of teacher training design.

Keywords: Creative Self-Efficacy; Job Autonomy; Knowledge Sharing; Perceived Organizational Support; Teacher Innovative Behavior

Introduction

Innovation serves as a crucial strategic cornerstone for the modernization of the economic system, ultimately guiding China's economy in the direction of high-quality development (Cai et al., 2021). Higher education has emerged as a crucial element within China's national innovation system, playing an indispensable role in nurturing students' capacities for creative and innovative thinking (Andiliou & Murphy, 2010; Feng & Kim, 2020). China has built the world's largest scale higher education system (Ministry of Education, 2022). Universities are an important component of China's efforts to transition from "Made in China" to "Made in China Innovation" (Wu, 2010). The innovative practices employed by teachers within universities occupy a central role in nurturing students' creative capacities and exert a direct impact on educational achievements, the standard of research, and the holistic growth of students. The development of students' innovative abilities largely depends on high-quality teaching, scientific research, and innovative activities conducted by front-line teachers (Frost, 2011). However, within the teaching ecosystem of Chinese universities, many teachers lack the capacity to guide students in areas such as academic exchange, discipline-specific competitions, innovation, and entrepreneurship activities, which are essential for nurturing students' innovative capabilities (Wu & Fernando, 2023). Thus, effectively enhancing teachers' innovative behaviors is a necessary and urgent task for improving the quality of talent cultivation in universities and boosting institutional competitiveness.

Organization Assessment

Zhanjiang University of Science and Technology (ZUST) is a typical private university established in 1999 in Guangdong Province. In 2021, ZUST set forth a new developmental objective: to transform the university into a nationally influential institution focused on innovation and entrepreneurship. The School of Management (SM) was among the first academic institutions established at ZUST and plays a crucial role in advancing the ongoing reforms aimed at fostering innovation and entrepreneurship within the university. The SM employs 100 individuals, comprising 85 teachers, counselors, and administrative staff. A comprehensive understanding of the current state of the SM is provided through the Six-Box Model Analysis, SWOT Analysis, and preliminary investigations. The Six-Box Model analysis of the School of Management reveals that while the organization has set clear development objectives and effectively communicated these to faculty, teacher motivation varies. Informal communication channels among teachers are limited and variably effective. Support mechanisms, including training and mentoring programs, are impacted by funding constraints and misalignment with teacher needs. Efforts to foster an innovative culture through supportive practices are underway but are challenged by resource allocation and a lack of managerial expertise. The SWOT analysis highlights a notable deficiency in the culture of innovation and knowledge sharing among school teachers. Opportunities for development are presented by the university's reforms aimed at fostering applied innovation and entrepreneurship, as well as the modernization of business programs to meet digital-era demands. External threats emphasize the critical need to enhance faculty innovation capabilities to better align with contemporary educational requirements. The analysis identified the need for organizational improvement specifically in enhancing teachers' innovation capabilities. The lack of innovative behavior

among teachers can be attributed to inadequate levels of creative self-efficacy, job autonomy, knowledge sharing, and perceived organizational support within the School of Management.

Research Objectives

      1.To determine the current status of ZUST teachers' creative self-efficacy, job autonomy, knowledge sharing, perceived organizational support, and teacher innovative behavior.

      2.To design and implement practical Organization Development Interventions (ODIs) to improve creative self-efficacy, job autonomy, knowledge sharing, and perceived organizational support to enhance ZUST teacher innovative behavior.

      3.To determine the differences between the Pre-ODI and Post-ODI with regards to creative self-efficacy, job autonomy, knowledge sharing, perceived organizational support, and ZUST teacher innovative behavior.

4.To investigate the relationship between creative self-efficacy, job autonomy, knowledge sharing, perceived organizational support, and ZUST teacher innovative behavior.

Literature Review

This study aimed to explore ZUST teachers' innovative behavior in the organization and identify the internal and external factors that influence their innovative behavior. Furthermore, it sought to evaluate the impact of these factors on teachers' innovative behavior.

Teacher innovative behavior refers to the degree of innovative behavior of teachers in the process of content generation, promotion and development of innovative ideas and implementation plans (Zhang, 2010). This behavior is influenced by a variety of factors that can be categorized into individual, work-related, organizational, and leadership factors (Zainal & Matore, 2019).

Research on innovative behavior at the individual level primarily centers on personal characteristics (Ng & Lucianetti, 2016). Prior studies have identified several individual factors that impact teacher innovative behavior, such as psychological capital, innovative willingness, motivation, and creative self-efficacy (Klaeijsen et al., 2018; Li et al., 2017). The mixed-methods research by Nemeržitski and Heinla (2020) on Estonian teachers demonstrated that teachers' creative self-efficacy can enhance classroom performance, foster creative teaching practices, and boost their overall creativity. The empirical analysis of Swaroop and Dixit (2018) confirmed that both job autonomy and employee engagement were positively related to employee innovative behavior.

Organizational factors, including culture, compensation, technology, and structure, play a crucial role in shaping employees' creative capabilities (Nazir et al., 2019). Notably, the organizational innovation climate stands out as a significant factor that positively influences innovative behavior (Hsu & Chen, 2017; Kang et al., 2016). The results of structural equation model analysis of physical education teachers in 40 primary schools in China showed that the sense of organizational support of physical education teachers had a positive relationship with their learning goal orientation and personal innovation behavior (Liu & Chang, 2023).

The relationship between leadership style and innovative behavior has been extensively documented (Amankwaa et al., 2022). Sagnak (2012) conducted a study utilizing Pearson correlation coefficient and regression analysis on survey data collected from 710 teachers and 55 principals in the Nigel Center and its surrounding areas. The findings revealed a strong positive correlation between principals' leadership empowerment behavior and teachers' innovative behavior.
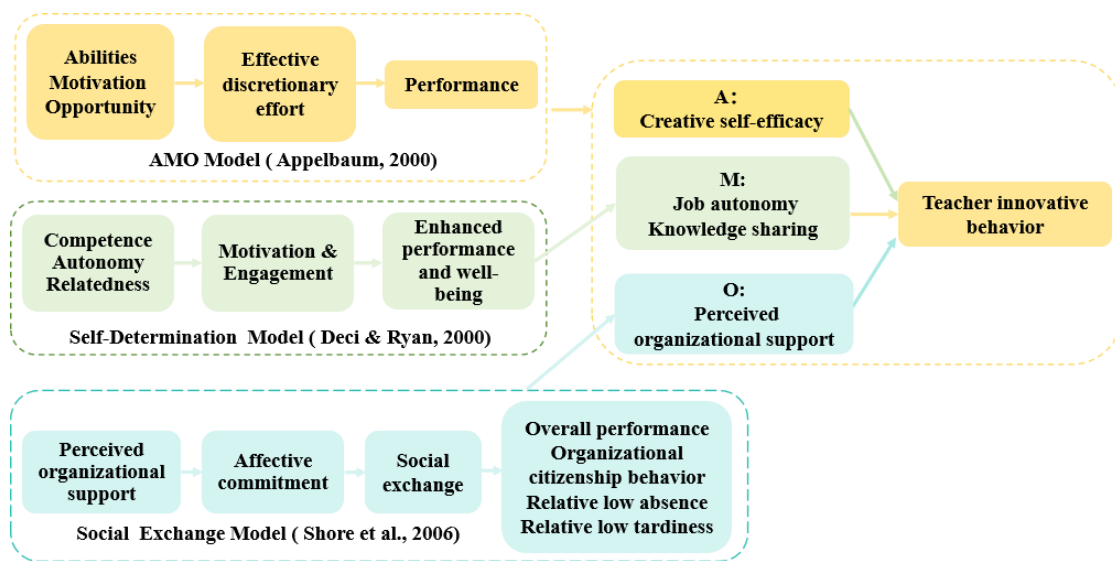
Theoretical Framework

The Ability-Motivation-Opportunity (AMO) Theory stands as one of the most renowned theoretical models within the realm of strategic human resource management research. This theory posits that opportunity, motivation, and ability collectively have a comprehensive effect on an individual's behavior (Appelbaum, 2000). Ability encompasses the psychological and cognitive capacities that enable an individual to effectively engage in an activity, typically consisting of knowledge, skills, and abilities (Fu et al., 2013). Motivation refers to the psychological and emotional drivers that influence an individual's willingness to participate in an activity (Munteanu, 2014). Opportunities refer to external environmental factors, such as events or interactions with others, which can either facilitate or hinder individual actions (Lepak et al., 2006). A reduction in the psychological significance of any component—ability, motivation, or opportunity—can lead to diminished behavior and a decline in performance levels (Appelbaum, 2000).

Self-Determination Theory states that persons possess intrinsic psychological needs, namely competence, autonomy, and relatedness, which are inherent rather than acquired (Ryan & Deci, 2024). The essence of Self-Determination Theory lies in the concept of internalization, which refers to the transformation of externally recognized behaviors into self-regulatory behaviors by individuals (Deci & Ryan, 2000). With the Self-determination Model, scholars have proven through empirical research that organizational behaviors such as flexible work systems, knowledge sharing, and organizational commitment can promote the emergence of innovative behaviors (Liu & Wang, 2022; Xiang et al., 2017).

Social Exchange Theory is a highly referenced and impactful framework in the field of employee-organization dynamics (Ahmad et al., 2023). Shore et al. (2006) developed a social exchange model which posited that when employees formed their perceptions of social exchanges with the organization, they concurrently considered both the actions of the organization (perceived organizational support) and their own reactions in terms of affective commitment. Social Exchange Model can well explain why and how externally recognized behaviors become self-regulated behaviors (Deci & Ryan, 2000; Gagné & Deci, 2005).

Integrating the aforementioned theories, the researcher constructed the theoretical framework for this study (Figure 1). AMO Model focuses on the behavior of individual employees in an organization and the impact on organizational performance caused by changes in employee behavior. Self-Determination Model mainly emphasizes the active role of the self in the motivation process. Social Exchange Model can better explain employee innovative behavior from the organizational-individual relationship level.

Figure 1

Theoretical Framework

Note: Constructed by the researcher.

Conceptual Framework

Based on the theoretical framework, this study selected appropriate variables to construct the conceptual framework of the study.

Teacher innovative behavior refers to the degree of innovative behavior of teachers in the process of content generation, promotion and development of innovative ideas and implementation plans (Zhang, 2010).

1. Creative Self-efficacy: Ability to Innovate

Creative self-efficacy is the confidence employees have in their capacity to exhibit creativity in their professional tasks (Tierney & Farmer, 2011). Chen and Zhang (2015) claimed that there was a positive correlation between CSE and individual creativity, and feedback-seeking behavior mediated the relationship between the two. In their study, Hsiao et al. (2011) demonstrated a strong and positive link between teachers' self-efficacy and their tendency to engage in innovative work behavior. Teachers' creative self-efficacy can improve teachers' performance in the classroom, produce creative teaching, and enhance their creativity (Nemeržitski & Heinla, 2020). Therefore, creative self-efficacy was selected as an independent variable of ability dimension to improve teacher innovative behavior.

2. Job Autonomy & Knowledge Sharing: Motivation to Innovate

Job autonomy refers to the autonomy in the initiation and continuation of work behaviors and process; examples are making decisions about work methods, pace, and effort (Spreitzer et al., 2012). Dara and Hamidah (2022) used structural equation modeling to develop a study on 760 lecturers at Indonesian universities. Studies suggested that there was a notable and favourable association between job autonomy and job satisfaction. Averill and Major (2020) suggested that increasing autonomy for instructors or students was a significant factor that

motivates innovative practice.

Knowledge sharing refers to individuals voluntarily sharing their professional knowledge or experience with others to help others learn new knowledge (Ortiz et al., 2017). Iqbal et al. (2011) demonstrated that there was a positive correlation between the intensity of knowledge sharing behavior and the innovation ability of universities. The structural equation model analysis of the survey data of 500 teachers in KM University in Indonesia stated that there was a positive correlation between leadership, knowledge sharing and innovation (Anis et al., 2021). Wabwezi's (2011) research demonstrated that knowledge sharing not only facilitated the achievement of innovation, but also persisted beyond its realization. Consequently, job autonomy and knowledge sharing were identified as independent variables within the motivation dimension to enhance teacher innovative behavior.
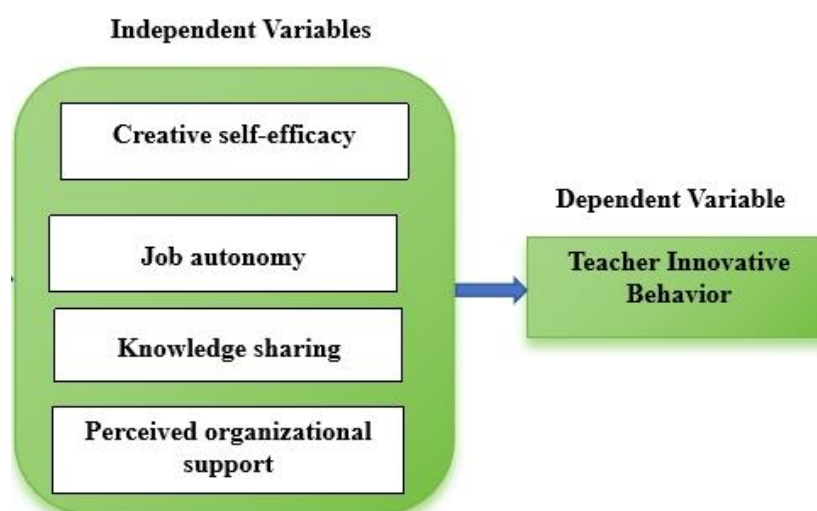
3. Perceived Organizational Support: Opportunity to Innovate

Perceived organizational support refers to employees' subjective perception and opinion that the organization cares about their work and values their interests (Rhoades et al., 2001). Mohammad and Harlech-Jones (2008) found a lack of guidance and support hindered teachers with respect to innovation. Cai and Tang (2022) stated that different needs had different effects on teachers' innovation motivation, and the support and relevance of organizations to teachers played a significant role in teachers' innovation. Therefore, perceived organizational support was selected as an independent variable of opportunity dimension to improve teacher innovative behavior.

Building on the preceding analysis, this study developed a conceptual framework that explores the interrelationships between teacher innovative behavior, creative self-efficacy, knowledge sharing, job autonomy, and perceived organizational support (Figure 2).

Figure 2

Conceptual Framework

Note: Constructed by the researcher

Research Hypotheses

Based on the study objectives and the literature reviews, the researcher proposed the following hypotheses:

H01: There is no significant difference in creative self-efficacy between Pre- and Post-ODI.

Ha1: There is significant difference in creative self-efficacy between Pre- and Post-ODI.

H02: There is no significant difference in job autonomy between Pre- and Post-ODI.

Ha2: There is significant difference in job autonomy between Pre- and Post-ODI.

H03: There is no significant difference in knowledge sharing between Pre- and Post-ODI.

Ha3: There is significant difference in knowledge sharing between Pre- and Post-ODI.

H04: There is no significant difference in perceived organizational support between Pre- and Post-ODI.

Ha4: There is significant difference in perceived organizational support between Pre- and Post-ODI.

H05: There is no significant difference in teacher innovative behavior between Pre- and Post-ODI.

Ha5: There is significant difference in teacher innovative behavior between Pre- and Post-ODI.

H06: There is no significant relationship between creative self-efficacy and teacher innovative behavior.

Ha6: There is significant relationship between creative self-efficacy and teacher innovative behavior.

H07: There is no significant relationship between job autonomy and teacher innovative behavior.

Ha7: There is significant relationship between job autonomy and teacher innovative behavior.

H08: There is no significant relationship between knowledge sharing and teacher innovative behavior.

Ha8: There is significant relationship between knowledge sharing and teacher innovative behavior.
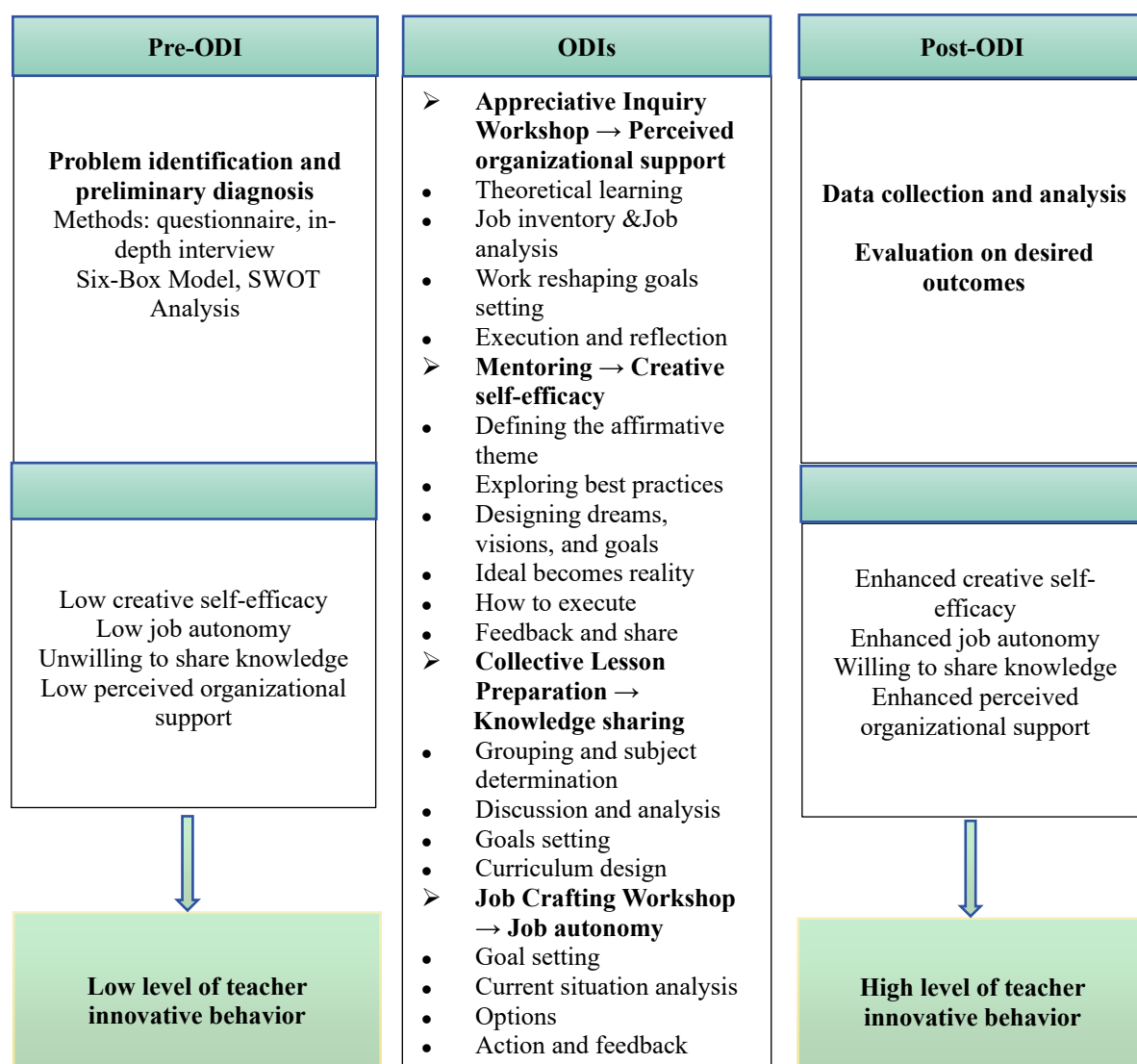
H09: There is no significant relationship between perceived organizational support and teacher innovative behavior.

Ha9: There is significant relationship between perceived organizational support and teacher innovative behavior.

Action Research Framework

Figure 3

Action Research Framework

Pre-ODI	ODIs	Post-ODI
Problem identification and preliminary diagnosis Methods: questionnaire, in-depth interview Six-Box Model, SWOT Analysis	➤ **Appreciative Inquiry Workshop → Perceived organizational support** • Theoretical learning • Job inventory &Job analysis • Work reshaping goals setting • Execution and reflection ➤ **Mentoring → Creative self-efficacy** • Defining the affirmative theme • Exploring best practices • Designing dreams, visions, and goals • Ideal becomes reality • How to execute • Feedback and share ➤ **Collective Lesson Preparation → Knowledge sharing** • Grouping and subject determination • Discussion and analysis • Goals setting • Curriculum design ➤ **Job Crafting Workshop → Job autonomy** • Goal setting • Current situation analysis • Options • Action and feedback	**Data collection and analysis** **Evaluation on desired outcomes**
Low creative self-efficacy Low job autonomy Unwilling to share knowledge Low perceived organizational support		Enhanced creative self-efficacy Enhanced job autonomy Willing to share knowledge Enhanced perceived organizational support
Low level of teacher innovative behavior		**High level of teacher innovative behavior**

Note: Constructed by the Researcher.

The action research framework comprised three stages: Pre-ODI, ODI, and Post-ODI.

During the Pre-ODI stage, an initial investigation was carried out using a mixed-methods approach that combined qualitative and quantitative techniques. An in-depth interview was conducted alongside the application of the Six-Box Model and SWOT Analysis to examine the innovative behaviors of teachers within the School of Management. Based on this investigation, current issues faced by these teachers were identified, leading to the formulation of research questions and hypotheses. Subsequently, a questionnaire survey was employed to delve deeper into these research issues.

In the ODI stage, four targeted ODI programs were implemented. Each program focused on enhancing a specific key variable: Mentoring Program to boost creative self-efficacy; Job Crafting Workshop aimed at increasing job autonomy; Collective Lesson Preparation sessions to encourage knowledge sharing; and Appreciative Inquiry Workshop designed to strengthen perceived organizational support.

In the Post-ODI stage, following the completion of the interventions, the researcher gathered and analyzed new data. This analysis informed the conclusions and recommendations made.

Research Methodology

Semi-structured interviews were conducted with representatives of SM teachers both before and after the ODIs. Interviews conducted prior to the implementation of ODI were designed to provide a more thorough understanding of the specific context within the research domain. In contrast, interviews carried out post-ODI implementation focused on evaluating the status of relevant research issues following ODI and offer recommendations for ODI activities. The questionnaires served as an instrument to measure SM teachers' levels of creative self-efficacy, job autonomy, knowledge sharing, perceived organizational support and innovative behavior before and after the ODI. This allowed for an assessment of the degree of change experienced and provided a means to test the proposed hypotheses.

Subjects of Study

This study utilized judgement sampling to select full-time SM teachers at ZUST as the subjects for quantitative, qualitative analysis, and ODI. The total population comprised of 70 individuals.

Research Instruments

The research utilized both questionnaires and interviews as data collection instruments. A semi-structured interview was conducted at the Pre- and Post-ODI stages, featuring four questions. Furthermore, a detailed set of questionnaires was distributed to the sample at each stage to assess the status of each variable. The questionnaire comprised 22 items designed to measure various aspects of the variables under investigation. The questionnaire adopted Likert's five-point scoring system, which ranges "Strongly Disagree", "Disagree", "Neutral", "Agree" to "Strongly Agree". Based on the respondent's most intuitive and true feelings, with scores ranging from 1 to 5. Prior to its official implementation, the researcher carried out reliability and validity tests on the questionnaire. The Item-Objective Congruence (IOC) method was utilized to verify the questionnaire's validity. In order to test the reliability of the questionnaire, the researcher invited 30 teachers from universities in Guangdong Province of China to participate in the pilot test through snowball sampling. The Cronbach's Alpha of the collected data was found to be 0.899, exceeding the threshold of 0.8, thereby indicating that the data possessed high reliability and was suitable for further analysis.

Tools for Qualitative and Quantitative Analysis

Quantitative analysis was performed using SPSS26 to examine the data gathered from the questionnaire at both the Pre-ODI and Post-ODI stages. The questionnaire data were processed and subjected to various statistical analyses, including standard deviation, mean, independent samples test, paired samples t-test, and Pearson's Correlation. For the qualitative data, a thematic analysis was utilized to analyse the interview content. Thematic analysis involves examining a dataset, which can include multiple interviews, focus groups, or diverse textual materials, aiming to identify significant and consistent patterns (Byrne, 2022). Thematic analysis conducted in this study was implemented according to the following steps: familiarize oneself with the data, initial codes generation, theme and sub-theme identification, theme review, definition and naming, research report crafting.

Design of OD Interventions

In light of the prevailing state of SM, the researcher devised four distinct ODI programs. These interventions encompassed: Appreciative Inquiry Workshop aimed at bolstering perceived organizational support; Mentoring program designed to augment creative self-efficacy; Collective Lesson Preparation initiative to encourage knowledge dissemination; and Job Crafting Workshop intended to elevate job autonomy. To enhance the effectiveness of each program, an interleaved implementation approach was adopted, which consequently extended the duration of each intervention.

Table 1

OD Interventions Design Program

No.	Intervention	Participants	Training hours	Period
1	**Appreciative Inquiry Workshop** • Defining the affirmative theme • Exploring best practices • Designing dreams, visions, and goals • Ideal becomes reality • How to Execute	70（100%）	4.5	2 Apr, 2024, 9 Apr, 2024 12 Apr, 2024
2	**Mentoring** • Goal setting • Current situation analysis • Options • Comprehensive action: what, when, who, and will • Action and feedback	70（100%）	3	16 Apr, 2024 28 Jul, 2024
3	**Collective lesson preparation** • Subject determination • Discussion and analysis • Goals setting • Curriculum design • Implementation and assessment	70（100%）	4.5	13 May, 2024 21 May, 2024 4 Jun, 2024

No.	Intervention	Participants	Training hours	Period
4	**Job Crafting Workshop** • Theoretical learning • Set work reshaping goals • Work crafting and reflection	70（100%）	3	18 Jun, 2024 16 Jul, 2024

Findings and Results

Quantitative Research Results of Descriptive Analysis

Quantitative analysis used mean, standard deviation, paired samples t-test and Pearson Correlation to test the data of Pre and Post ODI.

Table 2

Descriptive Analysis of Creative Self-efficacy in Pre and Post ODIs

Questions	Pre-ODI		Post-ODI		Improvement of mean % (Post vs. Pre)
	Mean	Std. Deviation	Mean	Std. Deviation	
1. I feel that I'm good at generating novel ideas.	3.557	.927	4.114	.578	15.66%
2. I have confidence in my ability to solve problems creatively.	3.643	.933	4.457	.630	22.34%
3. I have a skill for further developing ideas of others.	3.600	.923	4.114	.713	14.28%

Table 2 revealed that during both the Pre-ODI and Post-ODI phases, the mean values of Q1-Q3 were all within the "high" category. Furthermore, the mean values in the Post-ODI stage exceeded those of the Pre-ODI stage, suggesting an enhancement in innovative self-efficacy in the Post-ODI stage. Notably, among all items, Question 2 "I have confidence in my ability to solve problems creatively" demonstrated the most significant increase, with a growth rate of 22.34%.

Table 3

Descriptive Analysis of Job Autonomy in Pre and Post ODIs

Questions	Pre-ODI		Post-ODI		Improvement of mean % (Post vs. Pre)
	Mean	Std. Deviation	Mean	Std. Deviation	
4. I have autonomy in determining how I do my work.	3.643	1.050	4.057	.700	11.36%
5. I can decide on my own how to go about doing my work.	3.729	.962	4.443	.629	19.15%
6. I have considerable opportunity for independence and freedom in how I perform my work.	3.600	1.095	3.986	.807	10.72%

Table 3 showed that in the Pre-ODI and Post-ODI stages, the mean values of Q1-Q3 were all within the "high" category. Furthermore, the mean values in the Post-ODI stage were consistently higher than those in the Pre-ODI stage. However, the overall improvement in the three questions was not significant. Among these, Q5 "I can decide on my own how to go about doing my work" showed the most pronounced increase, with a growth rate of 19.15%, Q6 "I have considerable opportunity for independence and freedom in how I perform my work" demonstrated the least improvement, with a growth rate of 10.72%.

Table 4

Descriptive Analysis of Knowledge Sharing in Pre and Post ODIs

Questions	Pre-ODI		Post-ODI		Improvement of mean % (Post vs. Pre)
	Mean	Std. Deviation	Mean	Std. Deviation	
7. In daily work, I take the initiative to share my work-related knowledge with my colleagues.	3.671	.767	4.229	.752	15.20%
8. I share with other colleagues useful work experience and know-how.	3.429	.780	4.271	.721	24.56%
9. After learning new knowledge useful to work, I promote to let more of my colleagues learn it.	3.714	.756	4.157	.743	11.93%
10. I actively use the latest technology available to share my knowledge in the department.	3.671	.737	4.086	.654	11.30%

Questions	Pre-ODI		Post-ODI		Improvement of mean % (Post vs. Pre)
	Mean	Std. Deviation	Mean	Std. Deviation	
11. So long as the other colleagues need it, I tell whatever I know without any hoarding.	3.873	.825	3.986	.821	2.92%

Table 4 showed that in the Pre-ODI and Post-ODI stages, the mean values of Q1-Q5 were all within the "high" category. Furthermore, the mean values in the Post-ODI stage exceeded those of the Pre-ODI stage. Among the five questions, Q8 "I share with other colleagues useful work experience and know-how" exhibited the most significant improvement, with an increase of 24.56%; Q11 "So long as the other colleagues need it, I tell whatever I know without any hoarding" demonstrated the least improvement, with a mere increase of 2.92%.

Table 5

Descriptive Analysis of Perceived Organizational Support in Pre and Post ODIs

Questions	Pre-ODI		Post-ODI		Improvement of mean % (Post vs. Pre)
	Mean	Std. Deviation	Mean	Std. Deviation	
12. My school cares about my well-being.	3.629	1.010	3.943	.832	8.65%
13. My school shows much concern for me.	3.743	.943	4.100	837	9.54%
14. My school cares about my opinions.	3.814	.873	4.243	.624	11.25%
15. Help is available from my school when I have a problem.	3.843	.879	4.286	.663	11.53%
16. If given the opportunity, my school would not take advantage of me.	3.857	.921	4.129	.833	7.05%

Table 5 revealed that in the Pre-ODI and Post-ODI stages, the mean values of Q1-Q5 were all within the "high" category, with the mean values in the Post-ODI stage exceeding those in the Pre-ODI stage. Among all the questions, Q15 "Help is available from my school when I have a problem" demonstrated the most significant increase after ODI, with an increase rate of 11.53%. Conversely, Q16 "If given the opportunity, my school would not take advantage of me"exhibited the least increase, with an increase rate of 7.05%.

Table 6

Descriptive Analysis of Teacher Innovative Behavior in Pre and Post ODIs

Questions	Pre-ODI		Post-ODI		Improvement of mean % (Post vs. Pre)
	Mean	Std. Deviation	Mean	Std. Deviation	
17. I am good at finding new ideas and methods to solve problems.	3.686	.843	4.129	.536	12.02%
18. I am willing to cooperate with others to carry out my work.	4.029	.742	4.329	.696	7.45%
19. I will not blindly obey authority.	3.714	.801	4.186	.666	12.71%
20. I can develop specific implementation plans for innovative schemes.	3.671	.696	4.329	.557	17.92%
21. I can often think from different perspectives.	3.857	.767	4.386	.546	13.72%
22. I am good at cultivating and improving students' innovative ability.	3.771	.920	4.386	.687	16.31%

Table 6 showed that in the Pre-ODI and Post-ODI stages, the mean values of Q1-Q6 were all within the "high" range, and the mean values in the Post-ODI stage were all higher than that in the Pre-ODI stage. All questions showed improvement in performance compared to the Pre-ODI stage. Among them, Q20 "I can develop specific implementation plans for innovative schemes" exhibited the largest increase, with an improvement rate of 17.92%, while Q18 "I am willing to cooperate with others to carry out my work" had the smallest increase, with an improvement rate of 7.45%.

Table 6 revealed that during both the Pre-ODI and Post-ODI stages, the mean values for Q1-Q6 consistently fell within the "high" category. Furthermore, the mean values in the Post-ODI stage surpassed those of the Pre-ODI stage across all questions, indicating an enhancement in performance. Notably, Q20 "I can develop specific implementation plans for innovative schemes" demonstrated the most significant improvement at a rate of 17.92%. Conversely, Q18 "I am willing to cooperate with others to carry out my work"witnessed the least growth at a rate of 7.45%.

Quantitative Research Results of Hypotheses Testing

Table 7

Hypotheses Testing Results (H1-H5)

	Hypothesis	The corresponding variable	P- value	Results
H1	H01: There is no significant difference in creative self-efficacy between Pre- and Post-ODI. Ha1: There is significant difference in creative self-efficacy between Pre- and Post-ODI.	creative self-efficacy	0.022*	Ha1 was supported
H2	H02: There is no significant difference in job autonomy between Pre- and Post-ODI. Ha2: There is significant difference in job autonomy between Pre- and Post-ODI.	job autonomy	0.041*	Ha2 was supported
H3	H03: There is no significant difference in knowledge sharing between Pre- and Post-ODI. Ha3: There is significant difference in knowledge sharing between Pre- and Post-ODI.	knowledge sharing	0.016*	Ha3 was supported
H4	H04: There is no significant difference in perceived organizational support between Pre- and Post-ODI. Ha4: There is significant difference in perceived organizational support between Pre- and Post-ODI.	perceived organizational support	0.000**	Ha4 was supported
H5	H05: There is no significant difference in teacher innovative behavior between Pre- and Post-ODI. Ha5: There is significant difference in teacher innovative behavior between Pre- and Post-ODI.	teacher innovative behavior	0.000**	Ha5 was supported
* p<0.05, ** p<0.01				

Table 7 presents the results for hypotheses H1, H2, and H3. The p-values were 0.022, 0.041, and 0.016 respectively, all of which are less than 0.05. This suggests a significant difference in creative self-efficacy, job autonomy, and knowledge sharing between Pre-ODI and Post-ODI. Consequently, the null hypotheses (H01, H02, H03) are rejected and the alternative hypotheses (Ha1, Ha2, Ha3) are accepted.

For hypotheses H4 and H5, both p-values were less than 0.01, indicating a highly significant difference in perceived organizational support and teacher innovative behavior between Pre-ODI and Post-ODI. This supports the effectiveness of the implemented OD intervention programs. Therefore, the null hypotheses (H04, H05) are rejected and the alternative hypotheses (Ha4, Ha5) are accepted, demonstrating statistical significance in support of the research hypothesis.

Table 8

Hypotheses Testing Results (H6-H9)

	Hypothesis	**Sig. (2-tailed)**	**Pearson Correlation**	**Results**
H6	H06: There is no significant relationship between creative self-efficacy and teacher innovative behavior. Ha6: There is significant relationship between creative self-efficacy and teacher innovative behavior.	.000	0.768	Ha6 was supported
H7	H07: There is no significant relationship between job autonomy and teacher innovative behavior. Ha7: There is significant relationship between job autonomy and teacher innovative behavior.	.000	0.604	Ha7 was supported
H8	H08: There is no significant relationship between knowledge sharing and teacher innovative behavior. Ha8: There is significant relationship between knowledge sharing and teacher innovative behavior.	.000	0.739	Ha8 was supported
H9	H09: There is no significant relationship between perceived organizational support and teacher innovative behavior. Ha9: There is significant relationship between perceived organizational support and teacher innovative behavior.	.000	0.513	Ha9 was supported

Table 8 presented the Pearson Correlation results between the independent and dependent variables: 0.768 (creative self-efficacy and teacher innovative behavior), 0.604 (job autonomy and teacher innovative behavior), 0.739 (knowledge sharing and teacher innovative behavior), and 0.513 (perceived organizational support and teacher innovative behavior). These findings suggest a robust correlation between enhanced creative self-efficacy, job autonomy, knowledge sharing, and improved teacher innovative behavior. Additionally, there is a moderately strong correlation between heightened perceived organizational support and enhanced teacher innovative behavior. Consequently, these results refute the null hypotheses (H06, H07, H08, H09) and support the alternative hypotheses (Ha6, Ha7, Ha8, Ha9).

Qualitative Research Results

This study employed thematic analysis to analyze the semi-structured interview content of 12 interviewees. There were a total of five interview questions. A three-level coding system consisting of initial codes, sub-themes, and themes was established for each question.

The analysis of interviews conducted in the post-ODI stage emphasized the importance of practical engagement, mentorship, and reciprocal learning in fostering teachers' creative self-efficacy. While job autonomy saw significant improvements, challenges remained in balancing teaching responsibilities, research activities, and effective time management. Efforts by the school to promote knowledge sharing showed a promising trend; however, limitations in scheduling communication time, depth of interaction, and diversity of platforms hindered

the full realization of its potential. Organizational support was generally strong, particularly in resource allocation and opportunities for career advancement. Yet, there was a recognized need for more personalized attention to the specific needs and aspirations of individual teachers. Teachers demonstrated increased innovative behaviors, as seen in the adoption of new teaching methods, engagement in research, and initiatives to involve students. Despite these advances, fostering profound innovation, integrating interdisciplinary knowledge, and acknowledging innovative practices remained ongoing challenges.

The findings suggest that most participants viewed their status concerning the five variables as moderately to highly satisfactory during the Pre-ODI stage. Furthermore, the interviewees largely concurred that their creative self-efficacy, job autonomy, knowledge sharing, perceived organizational support, and teacher innovation behavior had significantly improved post-ODI program participation compared to their performance in the Pre-ODI stage.

Conclusions and Discussion

The research aimed to investigate the influence of ODI on enhancing teacher innovative behavior within the SM of ZUST. The findings revealed that ODI positively impacted creative self-efficacy, job autonomy, knowledge sharing, and perceived organizational support. Furthermore, the enhancement of teacher innovative behavior was found to be closely associated with improvements in creative self-efficacy, job autonomy, and knowledge sharing. It was also neutrally related to the improvement of perceived organizational support. Therefore, the effective execution of ODI programs contributed significantly to the enhancement of teacher innovative behavior within SM.

In the quantitative analysis, the improvement amplitude of each question in the Post-ODI stage was observed to be less than 30%, and the mean value of each variable exhibited an improvement amplitude of less than 20%. The researcher hypothesizes that this outcome primarily arises from the fact that university faculty members have already undergone comprehensive higher education and academic training prior to their university appointment, thereby possessing a high level of literacy and a certain degree of innovative capabilities. Consequently, the mean values of various questions in the questionnaire were already at an elevated level in the Pre-ODI stage. The ODI for university teachers is not a construction from scratch but rather a further enhancement based on an already solid foundation. Furthermore, in the descriptive analysis of each question, certain individual questions exhibited smaller increases, prompting researcher to conduct a detailed analysis of the underlying reasons.

The Pearson Coefficient analysis results revealed significant correlations between creative self-efficacy, job autonomy, knowledge sharing, and teacher innovative behavior. Additionally, a moderately significant correlation was observed between perceived organizational support and teacher innovative behavior. These findings can be elucidated by the Self-Determination Theory (Deci & Ryan, 2000). This theory posits that individual behavior is influenced by both internal self-selection and external factors, with behavioral decisions being more of a self-management and self-determination process (Deci & Ryan, 2012). The theoretical framework of this study, suggests that teacher innovative behavior is

determined by the combined factors of ability, motivation, and opportunity. In this context, ability is represented by the variable creative self-efficacy, motivation is represented by job autonomy and knowledge sharing, and opportunity is represented by perceived organizational support. Ability and motivation are categorized as internal factors, while opportunity is considered an external factor. For the cultivation and enhancement of teacher innovative behavior, internal factors exert a greater influence than external factors (Bawuro et al., 2019; Cohen, 2021).

The analysis conducted at the Post-ODI stage emphasized the significance of practical involvement, mentoring, and reciprocal learning in fostering teachers' creative self-efficacy, acknowledging the crucial need to enhance their confidence and bravery when confronted with challenges. Job autonomy was generally considered to have improved significantly, but there were still problems with balancing teaching tasks, research work, and time management. The school's knowledge sharing showed a trend of improvement, but communication time allocation, interaction depth, and sharing platform diversity restricted its potential. Organizational support was generally considered to be good in terms of resource provision and career development opportunities, but more attention should be paid to individualized consideration of teachers' needs and expectations. Teachers' innovative behaviors had improved, such as adopting new teaching methods, engaging in research activities, and taking measures to mobilize students. However, there were still problems with deep-level innovation, interdisciplinary knowledge integration, and innovative thinking recognition. Therefore, it is necessary to take comprehensive measures to solve these problems and create a better educational environment.

Recommendations

Based on the findings of both quantitative and qualitative research, the study advocates for specific strategies to augment teachers' innovative behaviors.

Establishing an open and inclusive innovation environment is imperative. SM should implement a consistent innovation seminar system, encourage teachers to engage in interdisciplinary and cross-institutional academic exchanges and collaborations, dismantle disciplinary barriers, and facilitate the cross-pollination of knowledge. The merging of disciplines is a significant trend in contemporary educational innovation (Lu, 2022), with interdisciplinary collaboration acting as a key catalyst for progress (Moirano et al., 2020). SM should encourage teachers to transcend disciplinary boundaries, promoting collaborations and knowledge exchanges with scholars from a variety of fields.

Job autonomy support mechanisms should be optimized to cultivate a sense of responsibility and proactive engagement among teachers in idea generation and promotion (Ozdemir & Cakalci, 2022).

SM should prioritize fostering a supportive and trustworthy environment that promotes open dialogue and constructive criticism among educators. This facilitates academic discourse and the sharing of tacit knowledge. Such an open cultural atmosphere is instrumental in establishing trust-based relationships among teachers, grounded in mutual understanding and

respect.

The study recommends that SM administrators gain a comprehensive understanding of the developmental needs and existing competencies of each faculty member, in order to devise more precise training and support strategies.

Research Limitations and Further Prospects

To enable future investigations, longitudinal study methods were employed to track teacher innovative behavior across three phases: Pre-ODI, during ODI, and Post-ODI. Cross-sectional data were collected through questionnaire surveys administered to teachers at two distinct time points. The study specifically targets university faculty for both the survey and action research components, and further testing will be required to assess the applicability of these findings to personnel in other sectors.

Analysis of survey questionnaires and interviews indicates that the well-structured ODI programs have led to improvements in variables during the Post-ODI stage. However, these improvements are not significantly noticeable. This is primarily because enhancing teachers' capabilities and behavioral changes is a gradual process. A four-month ODI period can initially improve teacher behaviors, aiding them in developing new ways of thinking and working. Nevertheless, the continuous and effective application of these capabilities necessitates ongoing support from the organization and the teachers themselves. Consequently, after the study's completion, the researcher will continue to implement ODI activities at SM on a regular basis.

This study explores four variables related to teacher innovative behaviors: creative self-efficacy, job autonomy, knowledge sharing, and perceived organizational support. According to Self-Determination Theory (Deci & Ryan, 2000), creative self-efficacy, job autonomy, and knowledge sharing can be categorized as internal factors, whereas perceived organizational support is classified as an external factor. In the research conducted by other scholars, employees' internal factors, such as personality, creativity, self-leadership skills, and psychological empowerment, all exert influences on their innovative behavior (Carmeli et al., 2006; Kong & Li, 2018; Singh & Sarkar, 2012). As for external factors, organizational commitment, leadership, and public service motivation also contribute to the enhancement of employee innovative behavior (Miao et al., 2018; Wahyuni et al., 2021). This study aims to focus on the impact of the aforementioned variables on employee innovative behavior in the future, with a specific focus on their correlation with the innovative behavior of university teachers.

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