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Developing Employees' Innovation Competence Through Organizational Development Intervention: A Case Study of Logis Company in China

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Abstract

This study aims to propose a systematic organizational development project to improve Individual Innovation Competence of employees by enhancing Perceived Innovative Organizational Culture, Affective Commitment, and Self-efficacy with Tacit Knowledge Sharing as the mediating variable. The researcher adopted action research on the focal company to test how Individual Innovation Competence can be improved by applying Organizational Development Intervention (ODI) measures to engage employees and promote Perceived Innovative Organizational Culture, Affective Commitment, Self-efficacy, and Tacit Knowledge Sharing. The stages of ODI are designed according to the framework of activities contributing to effective changing management, which contains five stages: motivating change, creating a vision, developing support, managing the transition, and sustaining momentum. Mixed methods were used to collect data by the close-ended questionnaire and the semi-structured interview before and after the ODI. Quantitative data was analyzed by Linear regression and Wilcoxon signed rank test to validate the hypotheses. The results indicated that Perceived Innovative Organizational Culture, Affective Commitment, Self-efficacy, Tacit Knowledge Sharing, and Individual innovation competence had significantly improved after the ODI. And Perceived Innovative Organizational Culture, Affective Commitment, and Self-efficacy positively correlate with Tacit Knowledge Sharing and Individual innovation competence. Tacit Knowledge Sharing positively correlates with Individual Innovation Competence and has a partially mediating effect on Perceived Innovative Organizational Culture, Affective Commitment, Self-efficacy to Individual Innovation Competence. Finally, an organizational development project is proposed for enhancing employees' innovation competence.

Keywords: Individual Innovation Competence, Perceived Innovative Organizational Culture, Affective Commitment, Self-efficacy, Tacit Knowledge Sharing, Action Research, Organizational Development Intervention (ODI)

Introduction

Background

Innovation is both an activity and a competence that can ensure innovative activities. Drucker (2001) thinks all organizations need innovation as one of their core competencies. Especially in the rapidly changing market environment, a business sustains and grows through effective innovation (Waychal & Ajit, 2011). This case study is based on one of the representative small and medium-sized enterprises (SMEs) in China. SMEs are regarded as a driven force of innovation that is devoted to the development of China (Cardoza et al., 2015). In the changing context, SMEs must transfer from competing on low prices to competing on providing better value to customers via developing innovative products and services (Loon & Chik, 2019). Innovation as an individual's competence is of crucial importance to sustain the competitive advantage of an organization (Waychal & Ajit, 2011). Therefore, it is necessary to enhance the innovation competence of current employees so that the gap between innovation demands and talent shortage will be made up.

The Focal Company and Organizational Diagnosis

Logis is a representative enterprise in the high-tech industry headquartered in Beijing. Based on its IT products, Logis provides supply chain optimizing services for enterprise clients and training solutions for college clients. In the context of technological change and industry upgrading in China, the high-tech industry is expected to be more innovative. Logis has to invest more in innovative products and services to meet the updated demands and face the muscular competition. Based on interviews with 12 top managers and core employees, organizational culture, affective commitment, self-efficacy and tacit knowledge sharing are regarded as key factors that influence innovation competence of employees in the focal company. It is suffering from some weakness and threats according to SWOT analysis. The climate to innovate has yet to be fully transferred from the top management to employees. Insufficient willingness and confidence to innovate reflect that employees need more affective commitment and self-efficacy to face the considerable competition and growing expectations of clients. As the demands become more complex and multiple, more tacit knowledge of Know-how and Know-who is needed to handle the untold tasks. Thus, the critical bottleneck still lies in human resources. It is crucial for both the focal company and the industry to enhance innovation performance by improving the innovation competence of current employees with a systematic training solution.

Research Problem Statement

The problem addressed by this study is to find a solution to improve the employees' innovation competence of companies in China. By planning training and activities from the perspectives of innovation ability, motivation, and opportunity as an intervention program with the employee population, the action research aims to test how innovation competence of employees can be improved by applying intervention measures.

Research Questions

RQ1: What are the appropriate ODI project to improve Individual Innovation Competence of employees?

RQ2: How effective is the ODI project in enhancing Individual Innovation Competence of employees?

RQ3: Is there a relationship between Perceived Innovative Organizational Culture, Affective Commitment, Self-efficacy, Tacit Knowledge Sharing, and Individual Innovation Competence of employees?

Significance

Most of the literature discusses determinants or elements of innovation competence. Seldom research discusses how to enhance innovation competence. Thus, the academic contribution of this research is to establish a framework to enhance Individual Innovation Competence in the workplace. The contribution to the practical world is to provide a set of measures to help enterprises enhance Individual Innovation Competence of employees.

Literature Review

Individual Innovation Competence

Based on both academic literature and evaluation of practitioners, the researchers addressed a model of innovation competence composed of five dimensions: creativity, critical thinking, initiative, teamwork, and networking based on the Framework for Innovation Competencies Development and Assessment (FINCODA) (Pérez-Peñalver et al., 2018). Meiju et al. (2018) suggested a five-dimensional model including creative problem-solving, systems thinking, goal orientation, teamwork, and networking competencies.

Perceived Innovative Organizational Culture and Its Relationship with Individual Innovation Competence

Innovative organizational culture is a social and cognitive environment that expects and guides employees to innovate (Jassawalla & Sashittal, 2002). It emphasizes creativity, opportunity-seeking, and risk-taking and encourages employees to carry out their jobs in new ways (Hogan & Coote, 2014). Innovative organizational culture is regarded as the climate helpful to accelerate the procedure of innovation (Thorn & Dvpgressman, 2003; Castro et al., 2019). The employees' Perceived Innovative Organizational Culture is a psychological security of encouraging constant innovation (Baer & Frese, 2003). Under an innovative organizational culture, the members take innovation as a standard organizational value (Naranjo et al., 2011). When the employees perceive an innovative culture, they are encouraged to come up with creative ideas, share knowledge or information, then facilitate innovation (Akgiin et al., 2010). The effect mechanism of Perceived Innovative Organizational Culture on Individual Innovation Competence can be explained by Affective Events Theory (Weiss & Cropanzano, 1996). Based on the "events-affection-attitude and behaviors" chain, by building an innovative organizational culture through some events to encourage innovation, employees may be inspired to behave innovatively. Innovation competence is derived from innovative work behaviors.

Affective Commitment and Its Relationship with Individual Innovation Competence

Affective Commitment is the employee's emotional attachment to, identification with, and involvement in the organization (Meyer & Herscovitch, 2001). When employees with affective commitment have new ideas, they are more ready to share and turn them into innovative practices or products (Brimhall, 2021). Affective Commitment positively affects Individual Innovation Competence (Nbm & Rea, 2020; Odoardi et al., 2019). According to Optimal Distinctiveness Theory, people have two basic and competitive needs, named inclusion and differentiation (Shore et al., 2011). Employees with affective commitment who feel inclusive need the feeling of differentiation through sharing diverse and different points of view. It is critical to increasing perceptions of innovation and fostering innovative ways of doing things (Camelo-Ordaz et al., 2011).

Self-efficacy and Its Relationship with Individual Innovation Competence

Self-efficacy refers to someone's belief in whether he or she can successfully organize and execute an action in a specific situation to achieve the expected results, and the level of Self-efficacy may determine the performance of individuals (Bandura, 1997). Much research verified that the employees' Self-efficacy is positively associated with their innovative work behaviors (Cai et al., 2019; Hsiao et al., 2011; Yang et al., 2011). The empirical study tested that high Self-efficacy is a leading predictor of Individual Innovation Competence (Waychal & Ajit, 2011).

Tacit Knowledge Sharing and Its Relationship with Individual Innovation Competence

Tacit knowledge is more empirical than explicit knowledge with undocumented, intuitive, unarticulated, and non-verbalized features, which is primarily based on the employees' experience and reflections (Hau & Evangelista, 2007). Many studies have shown that knowledge-sharing facilitates innovation (Kim & Lee, 2013; Oliveira et al., 2015). Most of the organization's knowledge is tacit knowledge. Employees willing to share their tacit knowledge tend to behave innovatively (Li et al., 2016; Lu & Liang, 2009). It is inferred that Tacit Knowledge Sharing positively affects the employees' Individual Innovation Competence. The Knowledge Fermenting Model explains how tacit knowledge is learned and applied to form innovation capability (Xiong et al., 2007).

The Relationship between Innovative Organizational Culture and Tacit Knowledge Sharing

Organizational innovative climate positively affects knowledge sharing among members (Ibrahim et al., 2018). Innovation is an essential determinant of knowledge sharing (Janiunaite & Petraite, 2023). According to the classification of organizational culture by Cameron et al. (2006), it was founded that clan and adhocracy organizational culture contribute positively to Tacit Knowledge Sharing (Ji & Wang, 2012; Suppiah & Sandhu, 2011). Both clan and adhocracy organizational cultures have characteristics similar to innovative organizational cultures. It is inferred that Perceived Innovative Organizational Culture positively affects Tacit Knowledge Sharing.

The Relationship between Affective Commitment, Self-efficacy, and tacit knowledge sharing

Much research manifests that organizational commitment facilitates Tacit Knowledge Sharing (Matzler et al., 2011; Salazar-Fierro & Bayardo, 2015). Knowledge sharing as an extra-role behavior, is primarily driven by intrinsic motivations (Lin, 2007). Employees affectively committed to the organization have motivation to share their knowledge for the organization's benefits (Hooff & Weenen, 2004). Self-efficacy positively affects knowledge sharing (Okyere-Kwakye et al., 2020). Rahman et al. (2018) found that self-efficacy has an important impact on tacit knowledge sharing behavior. Affective Commitment and Self-efficacy influence Tacit Knowledge Sharing mainly from the perspective of employees' intention to share knowledge (Lin, 2007), based on the Theory of Reasoned Action which suggests that individuals' behavioral intention is determined by their affective attitude towards behavior (Hau et al., 2013).

The Framework of Activities Contributing to Changing Management

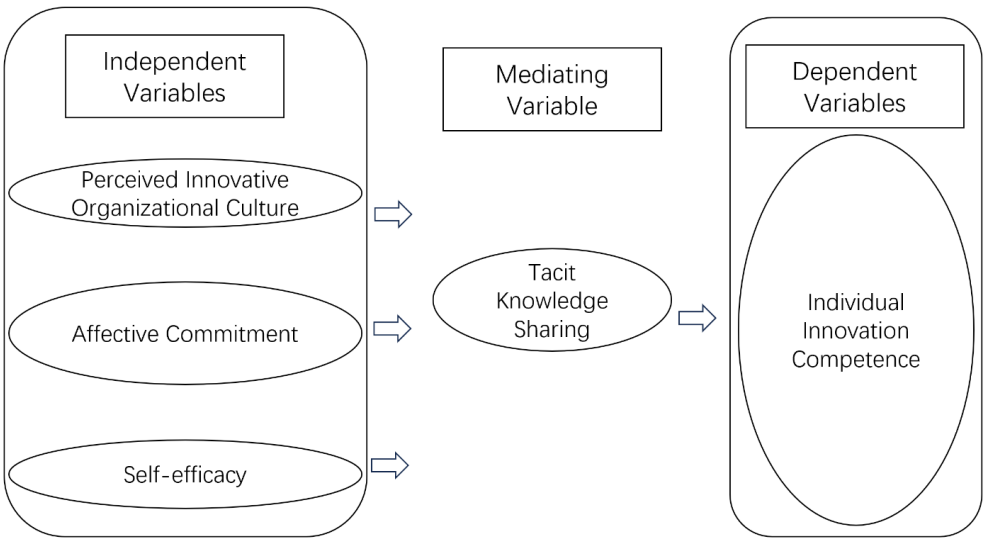
The stages of ODI are designed according to the framework of activities contributing to effective changing management, which contains five stages: motivating change, creating a vision, developing support, managing the transition, and sustaining momentum (Cummings & Worley, 2018). Through these stages, the organization is led to change at the individual, group and organizational level.

Conceptual Framework

The conceptual framework is as Figure 1.

Figure 1

Conceptual framework (developed by the author)



Research Methodology

Based on the above conceptual framework, the research hypotheses are as follows.

H_{1o}: Perceived Innovative Organizational Culture, Affective Commitment, Self-efficacy, and Tacit Knowledge Sharing has no statistically significant impact on Individual Innovation Competence of employees.

H_{1a}: Perceived Innovative Organizational Culture, Affective Commitment, Self-efficacy, and Tacit Knowledge Sharing has a statistically significant impact on Individual Innovation Competence of employees.

H_{2o}: Perceived Innovative Organizational Culture, Affective Commitment, and Self-efficacy has no statistically significant impact on Tacit Knowledge Sharing.

H_{2a}: Perceived Innovative Organizational Culture, Affective Commitment, and Self-efficacy has a statistically significant impact on Tacit Knowledge Sharing.

H_{3o}: Tacit Knowledge Sharing has no mediating effect on Perceived Innovative Organizational Culture, Affective Commitment, and Self-efficacy to Individual Innovation Competence of employees.

H_{3a}: Tacit Knowledge Sharing has a mediating effect on Perceived Innovative Organizational Culture, Affective Commitment, and Self-efficacy to Individual Innovation Competence of employees.

H_{4o}: No statistically significant difference exists between pre-ODI and post-ODI in Perceived Innovative Organizational Culture, Affective Commitment, Self-efficacy, Tacit Knowledge Sharing, and Individual Innovation Competence of employees.

H_{4a}: There is a statistically significant difference between pre-ODI and post-ODI in Perceived Innovative Organizational Culture, Affective Commitment, Self-efficacy, Tacit Knowledge Sharing, and Individual Innovation Competence of employees.

Research Design

This research is based on the pragmatic worldview. Convergent mixed methods were used with close-ended questionnaire survey and semi-structured interviews to collect data. The action research model was designed to test how individual innovation competence can be improved by applying ODI measures to engage employees and promote tacit knowledge sharing, affective commitment, self-efficacy, and perceived innovative organizational culture. Table 1 shows the design of ODI activities.

Table 1

Design of ODI Activities

Stage	ODI activity	Participants	Objectives	Variables
Motivating change	Kick-off meeting	All participants	Arouse needs to change and introduce the project.	Affective commitment
Creating vision	Goal setting	All participants	Invite expectations and encourage goal setting.	Self-efficacy
Developing support	Group leadership coaching	Middle managers and	Understand how to lead and empower group members, support innovation, and	Perceived innovative organizational

Stage	ODI activity	Participants	Objectives	Variables
		supervisors who lead a group	guide the behaviors contributing to innovation, referring to Switzer (2008).	culture, affective commitment
Managing transition	A half-day workshop on the Appreciative Inquiry Approach	All participants	Identify the company's core values and innovative culture and propose better measures to achieve the goals.	Perceived innovative organizational culture, Self-efficacy
	A half-day workshop on an innovative thinking tool	All participants	Provide an innovative thinking tool named Six Thinking Hats, referring to Kivunja (2015) in discussions and meetings.	Tacit knowledge sharing, Self-efficacy
	A half-day workshop on designing a training course with IT products	All participants	Provide customers' perspective. Share the tacit knowledge of "how to teach".	Tacit knowledge sharing
Sustaining momentum	Four group workshops in each significant division	Participants in a specific division	Get members involved in evaluating or designing a product using the innovative thinking tool.	Affective commitment, Tacit knowledge sharing
	Four cross-division group workshops	Participants from several divisions	Encourage compound innovation to meet the value of "IT empowers industry."	Tacit knowledge sharing

Research Scope and Sampling

This research mainly focuses on the effect of ODIs on employees' innovation competence through the improvement of Perceived Innovative Organizational Culture, Affective Commitment, Self-efficacy, and Tacit Knowledge Sharing. The action research is conducted on the focal company, which is one of the representative companies in high-tech industry of China. The population of this study is the company's employees, around 150 persons. As the headquarter in Beijing involving all types of positions plays the leading role in innovation, 60 employees in Beijing (except the top management) constitute the sampling frame. All samples participated in ODI activities and answered the questionnaire before and after ODI. In the meanwhile, the qualitative data were collected from eight of them through stratified sampling with five from R&D, one from marketing, and two from functional positions. See Table 2 for the demographic data of the participants.

Table 2

Demographic data of the participants

Features		Number of participants in ODI and quantitative data collection	Number of participants in qualitative data collection
Type of positions	R&D	37	5
	Marketing	6	1
	Functional and others	17	2
Gender	Male	31	4

Features		Number of participants in ODI and quantitative data collection	Number of participants in qualitative data collection
	Female	29	4
Level of positions	Director	6	1
	Manager	9	1
	Supervisor	12	2
	Staff	33	4
Serving years in the company	Less than 1	20	2
	1-3	14	2
	3-5	9	1
	5-8	8	1
	Above 8	9	2
Total		60	8

Research Instruments

Table 3 shows the reference of items in the questionnaire used to measure the variables. Thirty-eight items are rated on a Likert 5-point scale.

Table 3

Reference of items in the questionnaire

Section	Variable measured	Number of items	Reference
Scale for perception	Individual innovation competence	18	Revised FINCODA model (Andreu-Andres et al., 2018; Pérez-Peñalver et al., 2018)
	Perceived innovative organizational culture	5	Revised the scales from the perspective of individual perception (Kerlavaj et al., 2010; Menon et al., 1999)
	Affective commitment	4	Referred to Meyer and Herscovitch (2001) with his permission
	Self-efficacy	5	Revised the scales (Kinard & Webster, 2010; Sethumadevan et al., 2020)
	Tacit knowledge sharing	6	Revised the scales from the perspective of individual perception (Ganguly, 2019; Wang & Wang, 2012)

Five experts in OD field provided feedback on the Index of Item-objective Congruence (IOC) form between the research instrument questions, the research objectives, and the definitions of terms. The average score of each item is greater than or equal to 0.6, which means the questionnaire has good validity. 32 employees of the focal company outside Beijing answered the questionnaire for reliability test. Based on data analysis result through SPSS, Cronbach's Alpha coefficient of all the items is 0.896, and of items measuring each variable are 0.828, 0.762, 0.812, 0.690, and 0.764, which shows acceptable reliability of the questionnaire.

Data Collection and Analysis Process

Table 4 shows the data collection and analysis process used in this research corresponding to the hypotheses.

Table 4

Data analysis methods corresponding to the hypotheses

Research Hypotheses	Input (Data required)	Process (Data analysis)	Output (Expected data output)
Hypotheses 1-2	Post-ODI measurement data of five variables from all participants by questionnaire	Unary linear regression analysis	To find whether each IV impact MV and DV, whether the MV impact DV
Hypotheses 3	Post-ODI measurement data of five variables from all participants by questionnaire	Hierarchical linear regression analysis	To find whether tacit knowledge sharing mediates the relationship between IVs and DV
Hypotheses 4	Pre-ODI and post-ODI measurement data of five variables from all participants by questionnaire	Wilcoxon signed rank test	To find the differences between the means of Pre- and Post-ODI data
Hypotheses 4	Pre-ODI and post-ODI interview data from eight participants	Thematic analysis	To find more evidence for the effects of ODI

Results and Discussion

ODI Results

The ODI activities were conducted according to the design. Each activity was organized by procedures aiming to achieve the objectives designed. Through the observation on the process from the top management and the reflection of participants, the ODI results are summarized as shown in Table 5.

Table 5

The ODI results

ODI activities	How (Procedures)	Results
Motivating change / Kick-off meeting	Introduce the changing context; Analyze the SWOT of the company; Emphasize the significance of innovation; Introduce the training project.	The participants were aware of the need for innovation and aroused affective commitment.
Creating vision / Goal setting	Introduce the significance of goal setting and methods to set a goal; Practice goal setting.	The participants were led to clarify specific goals based on recent individual, group, and company objectives. It improved their self-efficacy to achieve objectives.
Managing transition / A half-day workshop on the Appreciative Inquiry Approach	Introduce the approach of appreciative inquiry; Organize a workshop to share honored job experiences in group with members from different divisions; Share stories of each group and reflect keywords, then conclude the core values that all recognize.	The participants felt honored and respected mutually, and learned new ideas from colleagues, which enhanced self-efficacy. The core values include innovation, customs-oriented, engagement, teamwork, which reinforced the innovative organizational culture.
Developing support / Group leadership coaching	Review the Appreciative Inquiry Approach and introduce supportive leadership style; Guide the leaders in designing an activity within groups using the Appreciative Inquiry	The leaders learned to communicate and design a group activity for group decision-making using an Appreciative Inquiry Approach or in a supportive manner. Thereby, the employees'

ODI activities	How (Procedures)	Results
	Approach and showing full support to encourage new thinking.	perceived innovative organizational culture and affective commitment were improved.
Managing transition / A half-day workshop on an innovative thinking tool	Introduce Six Thinking Hats from "what, why, when, where, who, and how"; Discuss the topic of products improvement with six thinking hats; Summarize the key points and reflect the outcomes.	The participants learned the innovative thinking tool which helped them with parallel, comprehensive, and innovative thinking and facilitated tacit knowledge sharing and aroused self-efficacy.
Sustaining momentum / Four division workshops	Help the leaders choose a topic and design the discussion procedure using six thinking hats within their division.	The participants mastered the six thinking hats tool and promoted their affective commitment through involvement in decision-making. They fully shared tacit knowledge about the topic through discussion.
Managing transition / A half-day workshop on designing a training product for teaching	Introduce the current designs; Invite the clients of the product (college teachers) to evaluate them and shared their teaching designs. Reflect on key points of training product design.	The participants refreshed the tacit knowledge oriented by customers' needs.
Sustaining momentum / Four cross-division workshops	Help the product managers design a cross-division meeting (R&D, marketing, functional) to facilitate tacit knowledge sharing of compound innovation.	The participants shared the tacit knowledge oriented by customers' needs and concluded the points to improve the products.

Quantitative Data Analysis Results

Table 6 shows the descriptive statistics results. All variables improved after ODI by 5.45%, 3.88%, 4.52%, 7.65%, and 4.44%, respectively. The standard deviation ranges from 0.40 to 0.69 before ODI and from 0.47 to 0.68 after ODI, showing a steady fluctuation.

Table 6

Descriptive Statistics of Items Pre- and Post- ODI

Variables	N	Mean (pre-ODI)	Mean (post-ODI)	Improvement	Std. Deviation (pre-ODI)	Std. Deviation (post-ODI)
Individual Innovation Competence	60	3.93	4.15	5.45%	0.40	0.47
Perceived Innovative Organizational Culture	60	4.02	4.18	3.88%	0.56	0.53
Affective Commitment	60	3.82	3.99	4.52%	0.69	0.68
Self-efficacy	60	3.61	3.89	7.65%	0.42	0.53
Tacit Knowledge Sharing	60	4.02	4.20	4.44%	0.53	0.49

According to the results of unary linear regression analysis on post-ODI data shown in Table 7, the variance of Individual Innovation Competence variable can be predicted at 53.3%, 47.2%, 55.5%, 62.2%, by Perceived Innovative Organizational Culture, Affective Commitment, Self-efficacy, and Tacit Knowledge Sharing. The impact of each variable on Individual Innovation Competence is statistically significant ($P=0<0.05$). The research

hypothesis H_{1a} are supported. And according to regression equations, the influence of tacit knowledge sharing is the most significant.

Table 7

Unary linear regression analysis result of Hypothesis 1

The regression equation	R^2	P of ANOVA (P<0.05 means statistically significant)	DW (between 1.5-2.5 shows no autocorrelation)
Y (Individual Innovation Competence) =1.41+0.654X (Perceived Innovative Organizational Culture)	53.3%	0.000	2.095
Y (Individual Innovation Competence) =2.249+0.475X (Affective Commitment)	47.2%	0.000	1.977
Y (Individual Innovation Competence) =1.562+0.665X (Self-efficacy)	55.5%	0.000	1.866
Y (Individual Innovation Competence) =0.991+0.752X (Tacit Knowledge Sharing)	62.2%	0.000	2.371

According to the results of unary linear regression analysis on post-ODI data shown in Table 8, the variance of Tacit Knowledge Sharing variable can be predicted at 45.2%, 54%, 55.5%, 46.9%, by Perceived Innovative Organizational Culture, Affective Commitment, and Self-efficacy. The impact of each variable on Tacit Knowledge Sharing is statistically significant (P=0<0.05). The research hypothesis H_{2a} are supported.

Table 8

Unary linear regression analysis result of Hypothesis 2

The regression equation	R^2	P of ANOVA (P<0.05 means statistically significant)	DW (between 1.5-2.5 shows no autocorrelation)
Y (Tacit Knowledge Sharing) =1.554+0.632X (Perceived Innovative Organizational Culture)	45.2%	0.000	1.886
Y (Tacit Knowledge Sharing) =2.068+0.533X (Affective Commitment)	54%	0.000	1.818
Y (Tacit Knowledge Sharing) =1.704+0.642X (Self-efficacy)	46.9%	0.000	1.88

Hierarchical regression was used on post-ODI data analysis to test the research Hypothesis 3. As shown in Table 9, after adding Tacit Knowledge Sharing, each P value of the former predictor (Perceived Innovative Organizational Culture, Affective Commitment, and Self-efficacy) and Tacit Knowledge Sharing to the dependent variable is less than 0.05. So, H_{3a} was supported. The partial mediating role of Tacit Knowledge Sharing was found. Furthermore, when adding Tacit Knowledge Sharing in regression equation, the B value of it is positive and larger than that of each independent variable. Thus, Tacit Knowledge Sharing plays more significant positive role in influencing Individual Innovation Competence.

Table 9

Results of Mediation Verification of Hypothesis 3

Dependent Variable： (Post-ODI) Individual Innovation Competence						
Coefficients [a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.41	0.339		4.164	0.000
	(Post-ODI) Perceived Innovative Organizational Culture	0.654	0.08	0.73	8.139	0.000
	(Constant)	0.605	0.312		1.936	0.058
	(Post-ODI) Perceived Innovative Organizational Culture	0.327	0.089	0.365	3.692	0.000
	(Post-ODI) Tacit Knowledge Sharing	0.518	0.094	0.544	5.505	0.000
2	(Constant)	2.249	0.267		8.421	.000
	(Post-ODI) Affective Commitment	0.475	0.066	0.687	7.201	.000
	(Constant)	1.032	0.317		3.253	0.002
	(Post-ODI) Affective Commitment	0.161	0.080	0.233	2.012	0.049
	(Post-ODI) Tacit Knowledge Sharing	0.588	0.111	0.617	5.323	0.000
3	(Constant)	1.562	0.307		5.092	0.000
	(Post-ODI) Self-efficacy	0.665	0.078	0.745	8.502	0.000
	(Constant)	0.710	.300		2.362	.022
	(Post-ODI) Self-efficacy	0.344	.089	.385	3.876	.000
	(Post-ODI) Tacit Knowledge Sharing	0.500	.095	.525	5.282	.000

According to the result of the Shapiro-Wilk W test, the quantitative data do not confir m the normal distribution. So, the Wilcoxon signed rank test was used to test the research hypothesis H_4 for examining the data difference between pre-ODI and post-ODI. As shown in Table 10, the p-value of Perceived Innovative Organizational Culture, Self-efficacy, Tacit Knowledge Sharing, and Individual Innovation Competence is less than 0.05, which shows a statistically significant difference between Pre- and Post-ODI. While the p-value of Affective Commitment is 0.088 (above 0.05), which shows no statistically significant difference. There needs to be more evidence from qualitative data analysis results.

Table 10

Result of Wilcoxon Signed Rank Test

Test Statistics [a]					
	Post- Individual Innovation Competence - Pre- Individual Innovation Competence	Post- Perceived Innovative Organizational Culture -Pre- Perceived Innovative Organizational Culture	Post- Affective Commitment - Pre- Affective Commitment	Post- Self-efficacy - Pre- Self-efficacy	Post- Tacit Knowledge Sharing - Pre- Tacit Knowledge Sharing
Z	-6.407[b]	-2.039[b]	-1.707[b]	-3.536[b]	-2.762[b]
Asymp. Sig. (2-tailed)	.000	.041	.088	.000	.006

Qualitative Data Analysis Results

Thematic analysis was used to analyze the qualitative data. There are 25 keywords that can be categorized into 13 themes related to 5 variables, respectively, as shown in Table 9. From the description of interviewees, it's obvious that Perceived innovative organizational culture, Affective commitment, Self-efficacy, Tacit knowledge sharing, and Individual innovation competence have been improved after ODI.

Table 9

Coding process

Variable	Theme	Keywords	Descriptive example (pre-ODI)	Descriptive example (post-ODI)
Individual innovation competence	Creativity	Searching for a new way	I needed help figuring out what technology was more fit for specific products.	I pay attention to new technology and changes in demands.
		Thinking differently	I need to take more comprehensive factors into account to apply new technology to new products.	I know how to think about problems from different perspectives, which helps with innovation.
	Initiative	Act quickly	I wait for detailed instructions from the leader before action.	I act on some tasks without being asked.
		Taking risks	I need more intention to think in a new way.	I am fearless in trying new ways.
	Critical thinking	System thinking	I need to ask why and how more.	I master some systematic methods to innovate.
		Challenging the status quo	I usually follow current practice.	I will try a new practice.
	Teamwork	Learning from others	I need to learn more from others' opinions and experience.	The training helps with understanding innovation at the group level.
		Cooperating with others	I usually work by myself and have little chance to work with others.	I communicate tasks with others and get mutual understanding.
	Networking	Using external resources	I need to integrate some external resources.	I am glad to ask for help from someone outside my group or company.
			I need to communicate more with the customers.	I listen to and integrate different opinions.
Perceived innovative organization culture	Encouraging participation	Encouragement	I am busy with routine tasks and innovative thinking is not easy to be inspired.	Through group discussion, I am encouraged to participate in the decision of some new tasks.
		Communication	I must discuss with colleagues from different positions to collaborate with new ideas.	Cross-section activities help to communicate with colleagues from different positions and to bring new insights to my job.

Variable	Theme	Keywords	Descriptive example (pre-ODI)	Descriptive example (post-ODI)
	Seeking innovative ideas	Relaxed atmosphere	I feel more tense rather than relaxed environment, which limits innovation.	The training activities build a more relaxed working atmosphere to discover people's thoughts.
		Fault tolerance	I feel frustrated when I make mistakes at work.	My leader values new attempts even if I fail.
Affective commitment	Recognizing the company's value	Recognizing as a member	I recognize the company's value.	I feel the deeper values of the company and become more active at work after a series of training activities.
		Willing to work here	I will work in this company for some time.	I can develop my career and achieve something in this company.
	Working hard towards this company's success	Valuing the company's good	I value company benefits at work, especially in front of clients.	I will try my best to safeguard the common good of this company.
		Devoting to the company's benefits	If the company gives me more attention, I will improve my level of commitment.	I am seen by my leaders and willing to devote more to work.
Self-efficacy	Competence	Performance	My job performance is ordinary.	I can do better since I learned methods and tools to work more effectively.
		Ability	My ability is fit for my current job.	Through training, I see more potential in myself.

Discussion

According to quantitative data analysis result, there is a statistically significant difference between pre-ODI and post-ODI in Individual Innovation Competence, Perceived Innovative Organizational Culture, Self-efficacy, and Tacit Knowledge Sharing, but no statistically significant difference in Affective Commitment. Combined with the statistical description result, the mean value of Affective Commitment improved by 4.52% after ODI. To add more evidence, the qualitative data analysis result shows a higher commitment to the company after ODI. The employees become more active and begin to take the job in this company as a career development opportunity. Furthermore, they show more concern for the benefit of the company and a willingness to devote more to the company. So, it is proved that ODI improves Affective Commitment. The qualitative data analysis result also shows Individual Innovation Competence, Innovative Organizational Culture, Self-efficacy, and Tacit Knowledge Sharing have been improved after ODI. Thus, the juxtaposed results show that the ODI project is effective in enhancing the innovation competence of employees.

So, all the alternative hypotheses were supported. Individual Innovation Competence is positively affected by Perceived Innovative Organizational Culture and Tacit Knowledge Sharing, and Perceived Innovative Organizational Culture positively affects Tacit knowledge sharing, which fills the research gap of innovation research. Affective Commitment and Self-

efficacy positively affect Individual Innovation Competence and Tacit Knowledge Sharing, which verifies the former research findings again. Tacit Knowledge Sharing partially and positively mediates the effects of Innovative Organizational Culture, Affective Commitment, and Self-efficacy to Individual Innovation Competence. And the role of Tacit Knowledge Sharing is primary in enhancing Individual Innovation Competence. These findings benefit both researchers in the field of innovation theory and practitioners in the field of innovation management, knowledge management, and competence training and coaching.

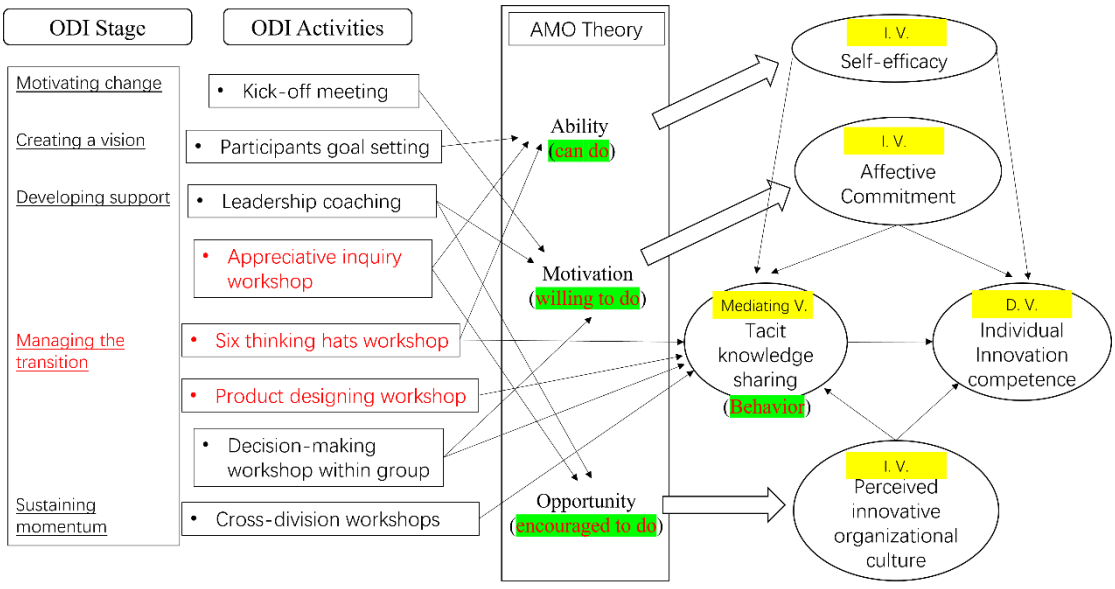
Conclusions and Recommendations

Recommendations

An OD project was proposed to provide a systematic training program for companies in China to improve the employees' innovation competence, especially in the context of increasing expectations of clients, entrance of competitors, and introduction of new technology. The OD project is shown in Figure 2.

Figure 2

ODI Model for Improvement of Individual Innovation Competence



The systematic OD project is designed to enhance individual innovation competence through ODI activities to facilitate Perceived Innovation Organizational Culture, Affective Commitment, Self-efficacy, and Tacit Knowledge Sharing. The ODI activities are implemented according to stage of motivating change, creating a vision, developing support, managing the transition, and sustaining momentum. A kick-off meeting should first be held among all participants, arousing the necessity of innovation for the organization to inspire motivation. Then, a goal-setting activity helps create vision by enhancing self-efficacy to achieve the goals individually. Leadership coaching should be held for group leaders to build an innovative organizational culture in sections. Next, three workshops facilitate the transition and change.

The Appreciative Inquiry workshop should be held for all participants to unleash creativity, knowledge sharing, and spirit toward a purpose, which provides an innovative atmosphere and improves individual confidence. The Six Thinking Hats Model is introduced in the workshop to facilitate critical thinking (Kivunja, 2015) as a parallel thinking method and tacit knowledge sharing by interaction among the participants. The product designing workshop helps with customer-oriented tacit knowledge sharing. Last, to sustain the effectiveness of ODI activities, methods and tools practiced in the above workshops should be applied in regular working tasks through workshops within groups and cross-division. The small-group activities could be held many times (four in this study) to facilitate more tacit knowledge sharing and involve more employees in decision-making at the group or organizational level.

Theoretical implications

First, this study uses an action research framework and attempts to build an organizational development project for enhancing the employees' innovation competence. It provides empirical evidence for the study of individual innovation in firms. Second, this study helps in understanding individual innovation competence and its relationship with those predictors, which enrich the literature on innovation, organizational culture, affective commitment, self-efficacy, and tacit knowledge sharing.

Practical implications

First, the proposed organizational development project could be implemented in human resources training and coaching to enhance the employees' innovation competence. Second, tacit knowledge sharing plays a significant role in enhancing the innovation competence of employees as a mediating variable. The specific training activities that facilitate tacit knowledge sharing such as workshops and discussions designed in this study rather than lectures and traditional meetings could be adopted more in human resources training.

Limitations and Further Research Venues

However, some limitations in this research deserve further improvement. First, the research data comes from only one focal company, and the data effectiveness is limited. Future research can extend to more organizations for broader verification. Second, the research sample size is limited to sixty employees of the focal company's headquarters in Beijing. The quantitative data does not confirm normal distribution. To obtain more comprehensive results, future research can expand the sample range to include more employees. Third, due to the limited period authorized by the focal company, the ODI process lasted only four months. The design of training activities and the perceived changes of employees are limited. Future research may attempt a longitude study to get more evidence.

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References

Akgiin, A. E., Keskin, H., & Byrne, J. C. (2010). Procedural justice climate in new product development teams: antecedents and consequences. *Journal of Product Innovation Management, 27*(7), 1096-1111.

Andreu-Andres, M.-A., González-Ladrón-de-Guevara, F. R., Garcia-Carbonell, A., & Watts-Hooge, F. (2018). Contrasting innovation competence FINCODA model in software engineering: narrative review. *Journal of Industrial Engineering and Management, 11*(4), 715-734. https://doi.org/10.3926/jiem.2656

Baer, M., & Frese, M. (2003). Innovation is not enough: climates for initiatives and psychological safety, process innovations, and firm performance. *Journal of Organizational Behavior, 24*(1), 45-68.

Bandura, A. (1997). *Self-Efficacy: The Exercise of Control.* Freeman.

Brimhall, K. C. (2021). Are we innovative? Increasing perceptions of non-profit innovation through leadership, inclusion, and commitment. *Review of Public Personnel Administration, 41*(1), 3-24.

Cai, W., Lysova, E. I., Khapova, S. N., & Bossink, B. A. G. (2019). *Does entrepreneurial leadership foster creativity among employees and teams? The mediating role of creative efficacy beliefs*. Springer.

Camelo-Ordaz, C., García-Cruz, J., Sousa-Ginel, E., & Valle-Cabrera, R. (2011). The influence of human resource management on knowledge sharing and innovation in Spain: The mediating role of affective commitment. *The International Journal of Human Resource Management*, *22*(7), 1441-1463. doi:10.1080/09585192.2011.561960

Cameron, K. S., Quinn, R. E., Degraff, J., & Thakor, A. V. (2006). *Competing values leadership: creating value in organizations*. Edward Elgar publishing.

Cardoza, G., Fornes, G., Li, P., Ning, X., & Song, X. (2015). China Goes Global: Public Policies' Influence on Small- and Medium-sized Enterprises' International Expansion. *Asia Pacific Business Review, 21*(2), 16.

Castro, L., Castro-Nogueira, M., Villarroel, M., & Toro, M. (2019). The Role of Assessor Teaching in Human Culture. *Biol Theory*, *14*(2), 112–121.

Cummings, T. G., & Worley, C. G. (2018). *Organization Development and Change* (11th ed.). Cengage Learning.

Drucker, P. (2001). *The Essential Drucker*. Butterworth Heinemann, Harper Collins.

Ganguly, A. (2019). Evaluating the role of social capital, tacit knowledge sharing, knowledge quality and reciprocity in determining innovation capability of an organization. *Journal of knowledge management, 23*(6), 1105-1135..

Hau, L. N., & Evangelista, F. (2007). Acquiring tacit and explicit marketing knowledge from foreign partners in IJVs. *Journal of Business Research*, *60*(11), 1152-1165

Hau, Y. S., Kim, B., Lee, H., & Kim, Y.-G. (2013). The Effects of Individual Motivations and Social Capital on Employees' Tacit and Explicit Knowledge Sharing Intentions. *International Journal of Information Management*, *33*, 356-366. http://dx.doi.org/10.1016/j.ijinfomgt.2012.10.009

Hogan, S. J., & Coote, L. V. (2014). Organizational culture, innovation, and performance: a test of Schein's model. *Journal of Business Research*, *67*(8), 1609-1621.

Hooff, B. V. D., & Weenen, F. D. L. V. (2004). Committed to share: commitment and cmc use as antecedents of knowledge sharing. *Knowledge & Process Management, 11*(1), 13-24.

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), 31-36. http://ijssh.org/papers/6-H00112.pdf

Ibrahim, H., Izwar, W., & Maisara, A. (2018). Engineers' perception of organizational innovative climate and knowledge sharing. *Advanced Science Letters, 24*(4), 2918-2921.

Janiunaite, B., & Petraite, M. (2023). The Relationship between Organizational Innovative Culture and Knowledge Sharing in Organization: The Case of Technological Innovation Implementation in a Telecommunication Organization. *Social Sciences, 3*(69), 15-23.

Jassawalla, A. R., & Sashittal, H. C. (2002). Cultures that Support Product Innovation Processes. *Academy of Management Executive, 16*(3), 42-53.

Ji, X., & Wang, L. (2012). *Empirical research on relationship between organizational culture and tacit knowledge-sharing.* Technology Economics.

Kerlavaj, M., Ji, H. S., & Lee, Y. (2010). Organizational learning culture, innovative culture and innovations in south korean firms. *Expert Systems with Applications, 37*(9), 6390-6403.

Kim, T. T., & Lee, G. (2013). Hospitality employee knowledge-sharing behaviors in the relationship between goal orientations and service innovative behavior. *International Journal of Hospitality Management*, *34,* 324-337.

Kinard, B., & Webster, C. (2010). The effects of advertising, social influences, and self-efficacy on adolescent tobacco use and alcohol consumption. *The Journal of Consumer Affairs, 44*(1), 24 –43.

Kivunja, C. (2015). Using De Bono's Six Thinking Hats Model to Teach Critical Thinking and Problem-Solving Skills Essential for Success in the 21st Century Economy. *Creative Education*, *6*(3), 380-391. doi: 10.4236/ce.2015.63037.

Li, Y., Xu, Y., & Yuan, X. (2016). Research on Influence Mechanism of Goal Orientation upon Employees' Innovative Behaviours Based on Tacit Knowledge Sharing Perspective. *Journal of Beijing Technology and Business University (Social Sciences)*, *31*(4).

Lin, H. F. (2007). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of information science, 33*(2), 135-149.

Loon, M., & Chik, R. (2019). Efficiency-centered, innovation-enabling business models of hightech SMEs: Evidence from Hong Kong. *Asia Pacific Journal of Management, 36*(1), 87-111. https://doi.org/10.1007/s10490-017-9558-4

Lu, L., & Liang, X. (2009). The Mediating Effect of Knowledge Sharing between Interpersonal Interaction and Innovation. *Nankai Business Review*, *12*(1), 118-123.

Matzler, K., Renzl, B., Mooradian, T., von Krogh, G., & Mueller, J. (2011). Personality traits, affective commitment, documentation of knowledge, and knowledge sharing. *The International Journal of Human Resource Management, 22*(2), 296–310.

Meiju, K., Jani, U., & Kari, N. (2018). How to measure students' innovation competences in higher education: evaluation of an assessment tool in authentic learning environments. *Studies in Educational Evaluation*, *58*, 30-36.

Menon, A., Bharadwaj, G. S., Phani, T. A., & Edison, W. S. (1999). Antecedents and consequences of marketing strategy making: a model and a test. *Journal of Marketing*, *63*(2), 18-40.

Meyer, J. P., & Herscovitch, L. (2001). Commitment in the workplace: Toward a general model. *Human Resuorce Management Review, 11*(3), 299–326.

Naranjo, V., Julia, C., Jiménez, D., & Sanz, V. R. (2011). *Innovation or imitation? the role of organizational culture.* Emerald Group Publishing Limited.

Nbm, A., & Rea, B. (2020). The impact of human resources information systems on individual innovation capability in Tunisian companies: the moderating role of affective commitment-sciencedirect. *European Research on Management and Business Economics, 26*(1), 18-25.

Odoardi, C., Battistelli, A., Montani, F., & José, M. P. (2019). Affective commitment, participative leadership, and employee innovation: a multilevel investigation. *Revistade Psicologiadel Trabajoydelas Organizaciones, 35*(2), 103-113.

Okyere-Kwakye, E., Nor, K. M., Awang, S. R., & Zaitul, A. (2020). Determinants of individuals' tacit knowledge sharing. *Journal of Information & Knowledge Management*, *19*(3), 2050024.

Oliveira, M., Curado, C. M. M., Macada, A. C. G., & Nodari, F. (2015). Using alternative scales to measure knowledge sharing behavior: are there any differences?. *Computers in Human Behavior, 44*(1), 132-140.

Pérez-Peñalver, M., Aznar-Mas, L., & Montero-Fleta, B. (2018). Identification and Classification of Behavioural Indicators to Assess Innovation Competence. *Journal of Industrial Engineering and Management (JIEM), 11*(1), 87-115. https://doi.org/10.3926/jiem.2552.

Rahman, M. S., Mannan, M., Hossain, M. A., Zaman, M. H., & Hassan, H. (2018). Tacit knowledge-sharing behavior among the academic staff trust, self-efficacy, motivation and big five personality traits embedded model. *The International Journal of Educational Management, 32*(5), 761-782.

Salazar-Fierro, P., & Bayardo, J. M. (2015). Influence of relational psychological contract and affective commitment in the intentions of employee to share tacit knowledge. *Open Journal of Business & Management, 3*(3), 300-311.

Sethumadevan, S., Hassan, Z., & Basit, A. (2020). *Enhancing innovation through learning organisation among the multinationals in malaysia: mediating role of self-efficacy.* Social Science Electronic Publishing.

Shore, L. M., Randel, A. E., Chung, B. G., Dean, M. A., Holcombe Ehrhart, K., & Singh, G. (2011). Inclusion and diversity in work groups: A review and model for future research. *Journal of Management*, *37*(4), 1262-1289. doi:10.1177/0149206310385943

Suppiah, V., & Sandhu, M. S. (2011). Organizational culture's influence on tacit knowledge-sharing behaviour. *Journal of knowledge management*, *15*(3), 462-477.

Switzer, C. (2008). Time for change: Empowering organizations to succeed in the knowledge economy. *Journal of Knowledge Management, 12*(2), 18–28.

Thorn, H., & Dvpgressman, M. (2003). Fostering a Culture of Innovation. *Proceedings of the United States Naval Institute*, *129*(4).

Wang, Z., & Wang, N. (2012). Knowledge sharing, innovation and firm performance. *Expert Systems with Applications, 39*(2012), 8899-8908.

Waychal, R. P. M., & Ajit, V. (2011). Leading indicators of innovation as a competence for individuals: an empirical study. *Journal of Advances in Management Research, 8*(2), 301-322. https://doi.org/10.1108/09727981111176000

Weiss, H. M., & Cropanzano, R. (1996). Affective events theory: a theoretical discussion of the structure, causes and consequences of affective experiences at work. *Research in Organizational Behavior, 18*(3), 1-74.

Xiong, D., Zhang, X., & Zhao, Q. (2007). Empirical Study on Innovation Competence Based on Tacit Knowledge. *2007 International Conference on Wireless Communications, Networking and Mobile Computing, 5855-5858.* https://doi.org/10.1109/wicom.2007.1437.

Yang, J. Z., Yang, D. T., Zhao, S. D., & Jing, L. D. (2011). The motivation of employee creativity: employee creative self-efficacy. *Advances in Psychological Science*, 1363-1370. http://journal.psych.ac.cn/xlkxjz.