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Enhancing Creativity through Organization Development Interventions: An Action Research at Beijing Polytechnic

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Abstract

This study aimed to enhance student creativity by improving students 'intrinsic motivation, knowledge sharing, student work engagement, and individual initiative which using organizational development interventions. The sample was 60 students from seven secondary colleges who participated in innovative practice activities in Beijing Polytechnic. The organization development intervention (ODI) implemented in this current research included group dynamics, appreciative inquiry (AI), goal setting, and team building, and coaching. The same questionnaire on creativity, intrinsic motivation, knowledge sharing, and student work engagement and individual initiative, which contains 25 items was distributed two times before and after ODI. Mixed methods are adopted to collect and analyze the data and test the hypotheses. Linear regression can explain whether creativity can be influenced by intrinsic motivation, student work engagement, and individual initiative. The paired samples t-test results shows that there is a significant improvement between pre- ODI and post- ODI. The qualitative results also show the student were more willing to carry out new ideas, communicating with each other more frequently, take more time to work and have more confidence when facing difficult. Overall, the students showed significant improvement after the OD intervention activities, and they were more motivated, engaged, and took more initiative in their work.

Keywords : creativity, intrinsic motivation, knowledge sharing, student work engagement, individual initiative, action research, organization development intervention

Introduction

From a global perspective, Innovation is becoming increasingly critical for our economy, work, and lives today. It is the basis of the social structure of our happiness. In short, innovation matters. However, there is still debate about the concept of Innovation - how exactly to define it and its essential features. Raymond and Steven (2019) put forward a set of six different meanings through interview analysis to define Innovation. The six meanings stress the scope of Innovation in corporate work and learning environments while also the need for the people who want to be innovative to focus on the different uses (Raymond & Steven, 2019).

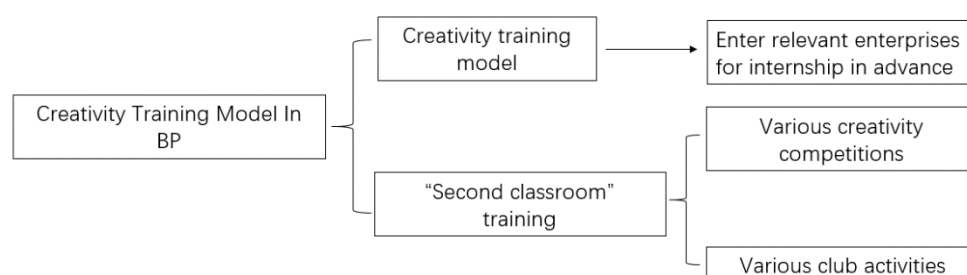
Faisal Iddris et al. (2022) define the innovation competence of students as the ability to continuously use their knowledge and skills to make new products or services (Faisal Iddris et al., 2022). Lundvaal (2013) believes Innovation means a kind of learning, learning through a series of specific activities. (Lundvaal, 2013). Different innovation competence models, without exception, list creativity as one of the essential dimensions of innovation competence, so, creativity is the core objective of this research.

As a significant source of future innovation, students are under increasing competitive pressure, requiring universities to strengthen students' creativity training. Innovation is the key to maintaining an edge in a highly competitive environment. Innovation ensures enterprises gain industrial advantages and organizational success (Afsar et al., 2014). Innovation is critical for long-term success in any area (Dyer et al., 2011). As a result, Innovation has become one of the most discussed topics in higher education.

As a vocational college, it can be seen from Made in China 2025 that the future vocational education process will focus on cultivating innovative and highly skilled talents. As a part of higher education, vocational education plays an essential role in carrying out a national innovation-driven development strategy. It is responsible for serving local economic development and providing high-quality and innovative technical and technical talents for society in line with the needs of industrial development (Zhang & Li, 2022). With the critical deployment and implementation of the national innovation-driven strategy, new technologies and achievements accelerate the transformation, and new models and business forms emerge constantly. Therefore, innovation-driven has become the key to deciding the fate of our development future. Talent cultivation with creativity is an essential element of innovation-driven implementation, and creativity is a significant index to measure the quality of talent cultivation. Therefore, the research on training and improving students' creativity in higher vocational colleges has both theoretical research significance and practical value (Huiling Wang, 2021).

Background of the Focal Organization

Beijing Polytechnic is a public and independent vocational college established by the Beijing Municipal Government. BP is located in Beijing's Economic and Technological Development Zone, the only institution of higher learning in the development zone. Adhering to the concept of "Build in the development zone, serve the development zone," the school has sent many highend technical talents to the enterprises in the development zone. With thousands of companies around, BP has the unique advantage of deep cooperation between schools and enterprises. Because of this situation, BP knows enterprises want to hire employee who has high level of creativity, and BP cultivate students' creativity in two ways, as shown in Figure 1.

Figure 1:*Current situation of creativity training in BP*

Source: Researcher (2023)

Organizational assessment

In the preliminary investigation, a series of questions on creativity training in BP were used to collect and analyze information through random interviews with students who have participated in the creative activities.

Based on the preliminary diagnosis and SWOT analysis, the results show below: First, most students only get credits or competition awards by participating in these activities, so the intrinsic motivation to enhance creativity is not strong. Second, there was a lack of communication among team members and no effective knowledge sharing channel was formed. Third, students can't maintain a high level of concentration during activities, they are not willing to pay more time and energy to finish the task. Fourth, when faced with difficulties in activities, students often cannot take the initiative to find a solution, but choose to escape or give up. To sum up, the intrinsic motivation, knowledge sharing, student work engagement and individual initiative of student should be enhanced in order to improve their creativity.

Research Problem

In today's world, innovation is the driving force for development. Creativity, as the core element of innovation ability, is essential for enterprises, and the cultivation of creativity has begun at the school stage. Therefore, cultivating students' creativity has a vital and far-reaching significance for both students and enterprises. According to the preliminary analysis, the level of creativity of BP students is low, and students were lack of intrinsic motivation to participate in creativity activities. They were not willing to devote more time and energy to participating in creativity, and they easily give up when facing difficulties. Therefore, this study explores ways to improve students' intrinsic motivation, knowledge sharing, student work engagement, and individual initiative to enhance their creativity.

Research Objectives

1. To measure the current level of students' creativity, intrinsic motivation, knowledge sharing, student work engagement and individual initiative in BP.
2. To design and implement suitable organization development interventions (ODIs) to improve creativity, intrinsic motivation, knowledge sharing, student work engagement and individual initiative.

3. To determine the differences of intrinsic motivation between the pre-ODI and post-ODI.
4. To determine the differences of knowledge sharing between the pre-ODI and post-ODI.
5. To determine the differences of student work engagement between the pre-ODI and post-ODI.
6. To determine the differences of individual initiative between the pre-ODI and post-ODI.
7. To determine the differences of creativity between the pre-ODI and post-ODI.

Research Questions

1. What is the current status of students' creativity, intrinsic motivation, knowledge sharing, student work engagement, and individual initiative?
2. What development interventions (ODIs) may be designed and implemented based on the pre-assessment results to improve the current situation?
3. What are the significant differences of intrinsic motivation between pre-and post-ODI?
4. What are the significant differences of knowledge sharing between pre-and post-ODI?
5. What are the significant differences of student work engagement between pre-and post-ODI?
6. What are the significant differences of individual initiative between pre-and post-ODI?
7. What are the significant differences of creativity between pre-and post-ODI?

Significance of the study

This study bears significant importance in two aspects. Firstly, fostering students' creativity can heighten their overall quality and core competitiveness, thus paving the way for more tremendous success in the future. Cultivating innovation skills among students is therefore crucial for driving social development. Secondly, a school can boost its reputation and appeal by improving creativity. Showcasing students' creative output enhances the school's image, attracting like-minded students and infusing the school with diversity and vigor. All in all, schools should prioritize enhancing creativity among students, as it equips them to tackle academic challenges, demonstrate independent thinking skills, promote the innovative development of the school, increase its social influence, and enhance its reputation and allure.

Literature Review

Creativity

Creativity means original and helpful ideas (Amabile, 1988). Creativity is also essential to practical personal and organizational manifestation (Zhao et al., 2021). Creativity is at the forefront of and fundamental to personal competence and talent (Kaufman et al., 2012). Creativity is also defined as generating new ideas that make organizations catch good developing opportunities, overcome difficulties, and make higher dreams come true (Cohen-Meitar et al., 2009). Personal Creativity is the way to carry out valuable ideas. People show

Creativity by making new information, updating skills, and improving their abilities to make more inventions (Xu et al., 2022).

Intrinsic Motivation

Intrinsic motivation means the degree of interest and engagement with the job for its own sake (Donald et al., 2020). Intrinsic motivation makes people participate in intrinsically satisfying and attractive work (Gagné et al., 2015). Intrinsically motivated employees do something because they find it interesting, even without extrinsic rewards. People with strong intrinsic motivation always want to participate in activities by their curiosity, under their new perspectives, with the pursuit of challenges (Vansteenkiste et al., 2010). Donald et al. defined intrinsic motivation as the interest in and participation in a task for its own sake (Donald et al., 2020). Gagné, M defines intrinsic motivation as enabling humans to participate in activities to obtain intrinsic satisfaction and interest (Gagné et al., 2015).

Knowledge Sharing

Knowledge sharing is defined as the process by which people exchange their own knowledge and come up with some new ideas together (Ansong et al., 2022). People gain new information when knowledge is donated and received to make sense of their work. Employees exchange their own judgments and innovate, which is a kind of knowledge sharing (Israilidis et al., 2015). Knowledge sharing is the sharing of information and expertise. Effective knowledge sharing helps organizations innovate (Cummings, 2004). Knowledge sharing means providing knowledge or skills to help or collaborate with others to solve problems and develop good ideas (Wang & Noe, 2010). Foss et al. (2010) defined knowledge sharing as a necessary process for group members to use knowledge resources and make themselves more creative (Foss et al., 2010).

Student Work Engagement

Work engagement is "a positive, fulfilling, work-related state characterized by energy, dedication, and focus" (Schaufeli et al., 2002). There are three dimensions to work engagement: energy, dedication and focus. Work engagement means working toward a goal, working hard, persevering, activating energy or motivated behavior (Locke & Latham, 1990). When performing job duties, employees achieve job engagement through optimism, satisfaction and motivation (Sheikh et al., 2019). This idea manifests itself in a sense of energy, dedication, and focus on work (Daugherty et al., 2015). Work engagement is a favorable emotionally stimulating situation that is very enjoyable and active (Bakker et al., 2011). Work involvement is a kind of happiness; when employees have better performance at work, they experience this emotion through optimism, satisfaction, and positive attitudes (Navajas-Romero et al., 2019).

Individual initiative

Individual initiative is a dimension of OCB (Podsakoff et al., 2000). Individual initiative can improve creativity. It is defined as personal behavior that takes a positive and high degree of autonomy working and goes beyond the requirements of a given job. Individual initiative is self-initiating, for it occurs without prerequisites, including self-set and assigned goals. Individual initiative is a long-term-oriented behavior because it shows that people have predictable problems and the advantage of opportunities. Individual Initiative is enduring because it involves tenacity to overcome problems, difficulties, and obstacles (Frese & Fay, 2001). Individual Initiative refers to the behavior in which employees voluntarily do something or behave in a certain way without being told (Podsakoff et al., 2009).

Theoretical Framework

Figure 2 shows the framework. According to the literature review, the Self-determination theory was used to explain the relationship between intrinsic motivation and creativity as well as the relationship between intrinsic motivation and student work engagement on creativity; student work engagement theory is used to explain the relationship between student work engagement and knowledge sharing. Social learning theory explains the positive impact of knowledge sharing on creativity. Social exchange theory can expound the positive influence of individual initiative on creativity.

Figure 2

Theoretical framework

Intrinsic motivation (IV)	Student work engagement(IV)	Individual initiative (IV)	Knowledge sharing (MV)	Creativity (DV)
Self-determination theory	Broaden and build theory	Social exchange theory	Self-determination theory	The Four P's Model,
Goal-setting theory	Work engagement theory	OCB	Social learning theory	The Componential Model of Creativity
Self-efficacy theory			Organizational learning	The 'Seven Seas' Model
			Single-Loop & Double-Loop & Deutero learning	The Interationalist Model
				The Five A's Model

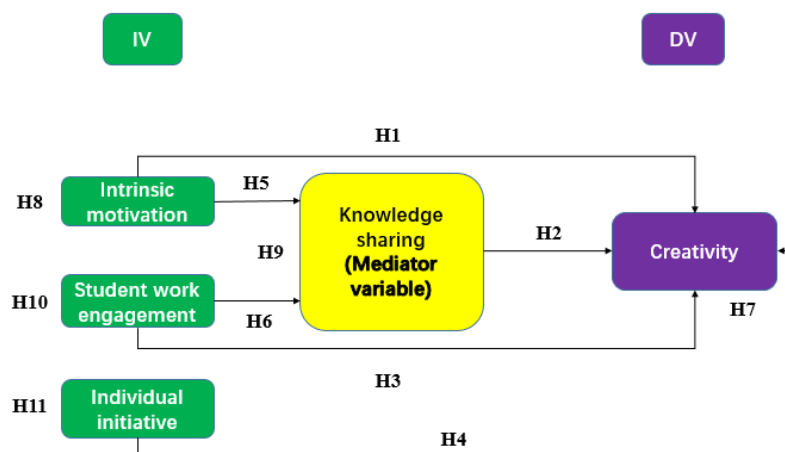
Source: Researcher (2023)

Conceptual Framework

The purpose of this research is to find out whether intrinsic motivation, knowledge sharing, student work engagement and individual initiative could impact creativity. It will also be designed to make a suitable Organization Development Intervention (ODI) to improve students' intrinsic motivation, knowledge sharing, student work engagement, and individual initiative and to enhance their creativity. Figure 3 shows the independent variables, mediator variable and dependent variable.

Figure 3

Conceptual framework (researcher, 2023)



Source: Researcher (2023)

Research Hypotheses

Based on the literature review and conceptual framework, these 11 hypotheses show as follows:

- Ho1: Students' intrinsic motivation has no significant impact on creativity.
- Ha1: Students' intrinsic motivation has a significant effect on creativity.
- Ho2: Students' knowledge sharing has no significant impact on creativity.
- Ha2: Students' knowledge sharing has a significant impact on creativity.
- Ho3: Students work engagement has no significant impact on creativity.
- Ha3: Students work engagement has a significant creativity.
- Ho4: Students' initiative had no significant impact on creativity.
- Ha4: Students' initiative has a significant impact on creativity.
- Ho5: Students' intrinsic motivation has no significant impact on knowledge sharing.
- Ha5: Students' intrinsic motivation has a significant knowledge sharing.
- Ho6: Students work engagement has no significant impact on knowledge sharing.
- Ha6: Students work engagement has a knowledge sharing.
- Ho7: There is no statistically significant difference in creativity between pre- and post-ODI.
- Ha7: There is a statistically significant difference in creativity between pre- and post-ODI.
- Ho8: There is no statistically significant difference in intrinsic motivation between pre-ODI and post-ODI.
- Ha8: There is a statistically significant difference in intrinsic motivation between pre-ODI and post-ODI.
- Ho9: There is no statistically significant difference in knowledge sharing between pre-ODI and post-ODI.
- Ha9: There is a statistically significant difference in knowledge sharing between pre-ODI and post-ODI.
- Ho10: There is no statistically significant difference in student work engagement between pre-ODI and post-ODI.
- Ha10: There is a statistically significant difference in student work engagement between pre-ODI and post-ODI.
- Ho11: There is no statistically significant difference in individual initiative between pre-ODI and post-ODI.
- Ha11: There is a statistically significant difference in individual initiative between pre-ODI and post-ODI.

Action Research Framework

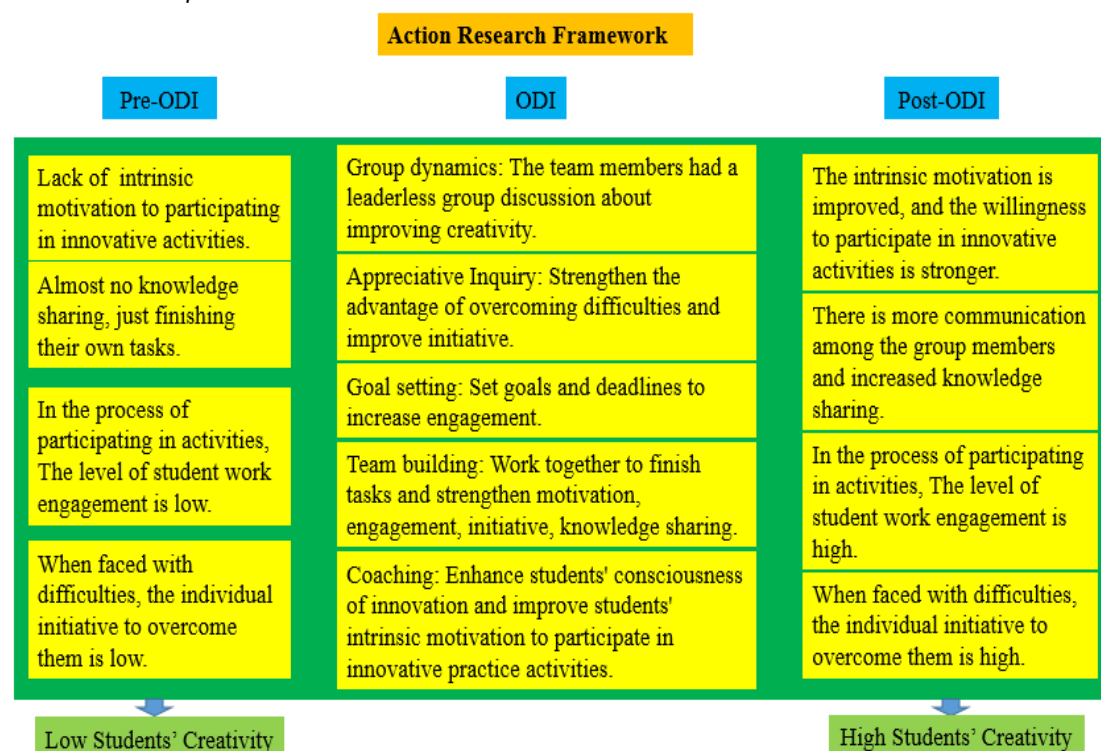
The ODI stage is designed to provide intervention activities tailored to address individual issues students face during their creative pursuits. This stage aims to enhance intrinsic motivation, knowledge sharing, and individual initiative by implementing organizational development interventions (ODIs). By nurturing group dynamics, the ODI stage fosters a conducive environment that encourages team members to enhance creativity and motivation. Appreciative inquiry is leveraged to strengthen the ability to overcome challenges and improve individual initiative. Furthermore, goal setting is implemented to ensure clear objectives and task deadlines, ultimately elevating student work engagement. Team building activities are utilized to facilitate task completion, the formation of team consciousness, improved cooperation, and reinforcement of intrinsic motivation, student work engagement, individual initiative, and knowledge sharing. Students who may require further guidance in understanding the intervention activities and improving their behavior during innovative practice activities are offered coaching. Following the intervention, data is collected and

compared with pre-ODI data during the post-ODI stage for analysis.

Figure 4 shows the action research framework.

Figure 4

Action research framework



Source: Researcher (2023)

Research Methodology

Research Design

In this research, the mixed methods were used to achieve the study's objectives. The methods included both quantitative and qualitative analysis techniques. The quantitative analysis involved a questionnaire survey among 60 volunteers majoring in different fields at BP. On the other hand, the qualitative analysis included conducting literature research and student interviews. In addition, pre-test and post-test designs were used in the study to help understand the research problem and assess the effectiveness of the research methods.

To test the questionnaire's validity, a panel of five experts in OD specialization or student innovation practice were consulted. These experts were all Ph.D. holders, with one having expertise in OD and the remaining four having rich experience in student creativity activities. The questionnaire items were evaluated using the Item-Objective Congruence (IOC) based on the score range from -1 to +1. The experts' scores showed that items 5, 8, 10, 13, 18, 19, 20, 22, and 23 had an average score of 0.8, with an average score of 1. This result indicated that the questionnaire items were valid and reliable in measuring the intended constructs.

To examine the questionnaire's reliability, 30 junior students were selected to finish this test and the questionnaires sent through the WJX platform. Before the questionnaire, the students were provided with an instruction guide on completing it. The participants rated the scale

es by choosing a 1-5-point Likert-format scale. The results showed that the Cronbach's Alpha values of the five variables were all higher than 0.7, indicating good reliability of the questionnaire. Specifically, Cronbach's Alpha for the creativity scale was 0.733, the Cronbach's Alpha values for the intrinsic motivation scale was 0.845, the Cronbach's Alpha values for the knowledge sharing scale was 0.896, and the Cronbach's Alpha values for the student work engagement scale was 0.749. The Cronbach's Alpha values for the individual initiative was 0.810. These results confirmed the questionnaire's reliability and the research methods' effectiveness.

Research Sampling and Instruments

In this study, students who has experience in participating in creativity activities is the research object and the total number of these students were 465. According to the equation below:

$$n = \frac{N}{1 + N(e)^2} = \frac{465}{1 + 465 \times (0.05)^2} = 215$$

The sample size should be 215. Due to the limitation of workplace, only 60 participants were selected by the principle of stratified sampling to join in the ODI activities shows in Table 1.

Table 1

Participants in each College

Order	College	Sampling number
1	College of Mechanical and Electrical Engineering	9
2	College of Aeronautical Engineering	7
3	College of Telecommunication Engineering	10
4	College of Automotive Engineering	8
5	College of Biological Engineering	10
6	College of Economics and Management	8
7	College of Art and Design	8
Total		60

Source: Researcher (2023)

Research Instruments

The research instruments were designed, which is depending on the actual situation of the research objective. For the quantitative research, a questionnaire was made to measure creativity, intrinsic motivation, knowledge sharing, student work engagement and individual initiative. This questionnaire contains 5 items for each variables which scale uses a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree". For qualitative research, an interview outline was made to measure the manifestation of participants before and after ODI activities.

Procedure

Pre-ODI Stage (Preliminary Diagnosis)

At this stage, through a preliminary diagnostic questions, interview, SWOT analysis, the problems of BP students in participating in innovative activities are clarified. This research will randomly use a questionnaire to interview students who participated in innovative practice activities to discover the problems.

ODI Stage

In the ODI phase, an OD intervention models was made. According to theoretical and conceptual frameworks, interventions can be divided into improving students' intrinsic motivation, student work engagement, individual initiative, and enhancing knowledge sharing among students. Specific interventions include group dynamics, Appreciative Inquiry (AI), goal setting, team building, and coaching.

Group dynamics

In this study, participants sat together in a leaderless group discussion, using brainstorming to explore how to improve creativity; for instance, students will discuss what kind of environment can promote the improvement of innovation.

Appreciative Inquiry (AI)

The information was obtained through dialogues with the participants and integrated it into a comprehensive list of success elements and other topics related to successful experiences. To encourage students to speculate on what may happen in the future in innovative practice, and to boldly propose challenging solutions. Guide students to develop specific action plans to achieve the organization's goals.

Goal setting

Establishing challenging goals and creating environmental factors that support the achievement of these goals may enable students to obtain better work inputs than planned to determine whether the goals are stimulating and challenging, whether they support increased engagement in innovative practices, and if they do not achieve the intended goals, learn from the experience and modify it.

Team building

The first activity is to put a one-square-meter piece of paper on the ground. All team members pull the rope's end without touching the brush and complete the assigned task as the researcher requires and the fastest finish wins. The second activity is the relay run back; each team starts from the "starting line" and crosses the "relay line" to walk one way; the relay team stands in the "relay line" after receiving the baton and start, completely cross the "starting line" stop the meter. Win the race with the fewest time. In the third activity, each participant's left foot is tied to the right foot of the next participant, the course length is 30 meters, and the challenger can finish in 40 seconds for success.

Coaching

In this part, students who do not fully understand the purpose of creativity activities will be guided by the researcher, who will tell them the purpose of participating in creativity activities, what they should do in order to better integrate into the team, and teach them some communication skills.

Post-ODI Stage

In this stage, students' creativity, intrinsic motivation, knowledge sharing, student work engagement, and individual initiative were measured again using the same questionnaire. The changes in these variables before and after ODI intervention were compared and analyzed.

Data Collection and Analysis

In this study, data for quantitative analysis were collected through WJX (www.wjx.cn), while data for qualitative analysis were collected through notes and audio recordings. In the process of data analysis, linear regression analysis and Paired sample t-test were used for quantitative analysis and coding method was adopted for qualitative analysis.

Results and Discussion

Quantitative Findings

For testing H_{01} and H_{a1} , unary linear regression was used. The results were shown in Table 2:

Table 2

The results of hypothesis 1

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.532	1	3.532	95.813	.000
	Residual	2.138	58	.037		
	Total	5.669	59			
a. Dependent Variable: Post-Creativity						
b. Predictors: (Constant), Post-Intrinsic Motivation						
Source: Researcher (2023)						

The result shows that $p=0.000$, which is smaller than 0.05, indicating that the null hypothesis H_{01} was rejected, and the alternative hypothesis H_{a1} was established, which means intrinsic motivation has an impact on creativity.

For testing H_{02} and H_{a2} , unary linear regression was used. The results were shown in Table 3:

Table 3

The results of hypothesis 2

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.492	1	3.492	92.994	.000
	Residual	2.178	58	.038		
	Total	5.669	59			
a. Dependent Variable: Post-Creativity						
b. Predictors: (Constant), Post-Knowledge Sharing						
Source: Researcher (2023)						

The result shows that $p=0.000$, which is smaller than 0.05, indicating that the null hypothesis H02 was rejected, and the alternative hypothesis Ha2 was established, which means knowledge sharing has an impact on creativity.

For testing Ho3 and Ha3, unary linear regression was used. The results were shown in Table 4:

Table 4

The results of hypothesis 3

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.464	1	3.464	91.132	.000
	Residual	2.205	58	.038		
	Total	5.669	59			
a. Dependent Variable: Post-Creativity						
b. Predictors: (Constant), Post- Student Work Engagement						
Source: Researcher (2023)						

The result shows that $p=0.000$, which is smaller than 0.05, indicating that the null hypothesis H03 was rejected, and the alternative hypothesis Ha3 was established, which means student work engagement has an impact on creativity.

For testing Ho4 and Ha4, unary linear regression was used. The results were shown in Table5:

Table5

The results of hypothesis 4

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.550	1	3.550	97.157	.000
	Residual	2.119	58	.037		
	Total	5.669	59			
a. Dependent Variable: Post-Creativity						
b. Predictors: (Constant), Post-Individual initiative						
Source: Researcher (2023)						

The result shows that $p=0.000$, which is smaller than 0.05, indicating that the null hypothesis H04 was rejected, and the alternative hypothesis Ha4 was established, which means individual initiative has an impact on creativity.

For testing Ho5 and Ha5, unary linear regression was used. The results were shown in Table 6:

Table 6*The results of hypothesis 5*

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.903	1	5.903	272.343	.000
	Residual	1.257	58	.022		
	Total	7.160	59			
a. Dependent Variable: Post-Knowledge Sharing						
b. Predictors: (Constant), Post-Intrinsic Motivation						
Source: Researcher (2023)						

The result shows that $p=0.000$, which is smaller than 0.05, indicating that the null hypothesis H05 was rejected, and the alternative hypothesis Ha5 was established, which intrinsic motivation has an impact on knowledge sharing.

For testing Ho6 and Ha6, unary linear regression was used. The results were shown in Table 7:

Table 7*The results of hypothesis 6*

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.878	1	5.878	265.909	.000
	Residual	1.282	58	.022		
	Total	7.160	59			
a. Dependent Variable: Post-Knowledge Sharing						
b. Predictors: (Constant), Post-Student Work Engagement						
Source: Researcher (2023)						

The result shows that $p=0.000$, which is smaller than 0.05, indicating that the null hypothesis H06 was rejected, and the alternative hypothesis Ha6 was established, which means student work engagement has an impact on knowledge sharing.

For testing Ho7 and Ha7, paired sample t-test was used. Table8 shows the results.

Table 8*The results of hypothesis 7*

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post-Creativity - Pre-Creativity	2.1533	.1891	.0244	2.1045	2.2022	88.215	59	.000

Source: Researcher (2023)

The result shows that $p=0.000$, which is smaller than 0.05, indicating that the null hypothesis Ho7 was rejected, and the alternative hypothesis Ha7 was established, which means there is a statistically significant difference in creativity between pre- and post-ODI.

For testing Ho8 and Ha8, paired sample t-test was used. Table 9 shows the results.

Table 9

The results of hypothesis 8

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post-Intrinsic Motivation - Pre- Intrinsic Motivation	2.0233	.1382	.0178	1.9876	2.0590	113.382	59	.000

Source: Researcher (2023)

The result shows that $p=0.000$, which is smaller than 0.05, indicating that the null hypothesis Ho8 was rejected, and the alternative hypothesis Ha8 was established, which means there is a statistically significant difference in intrinsic motivation between pre- and post-ODI.

For testing Ho9 and Ha9, paired sample t-test was used. Table 10 shows the results.

Table 10

The results of hypothesis 9

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post-Knowledge Sharing - Pre- Knowledge Sharing	2.0767	.1477	.0191	2.0385	2.1148	108.899	59	.000

Source: Researcher (2023)

The result shows that $p=0.000$, which is smaller than 0.05, indicating that the null hypothesis Ho9 was rejected, and the alternative hypothesis Ha9 was established, which means there is a statistically significant difference in knowledge sharing between pre- and post-ODI.

For testing Ho-10 and Ha10, paired sample t-test was used. Table 11 shows the results.

Table 11*The results of hypothesis 10*

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post- Student Work Engagement - Pre- Student Work Engagement	1.9667	.1115	.0144	1.9379	1.9955	136.641	59	.000

Source: Researcher (2023)

The result shows that $p=0.000$, which is smaller than 0.05, indicating that the null hypothesis H_0-10 was rejected, and the alternative hypothesis H_{a10} was established, which means there is a statistically significant difference in student work engagement between pre- and post-ODI.

For testing H_0-11 and H_{a11} , paired sample t-test was used. Table 12 shows the results.

Table 12*The results of hypothesis 11*

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post-Individual initiative - Pre- Individual initiative	1.9100	.1069	.0138	1.8824	1.9376	138.422	59	.000

Source: Researcher (2023)

The result shows that $p=0.000$, which is smaller than 0.05, indicating that the null hypothesis H_0-11 was rejected, and the alternative hypothesis H_{a11} was established, which means there is a statistically significant difference in individual initiative between pre- and post-ODI.

Qualitative findings

In terms of students' creativity, the participants mentioned in the interview that they have a deeper understanding of creativity and understand that they should dare to try things, keep curious about things and develop dialectical thinking, all of which help enhance their creativity.

ity. In terms of intrinsic motivation, participants mentioned that they should follow their inner thoughts and participate in activities more actively, so as to get rid of the passive mentality. In terms of knowledge sharing, participants understand the importance of communication and are more open and inclusive. In terms of student work engagement, students are more active and willing to devote more time and energy to creativity activities. They enjoy such a state of full commitment to work. In terms of individual initiative, students can face difficulties bravely, actively look for solutions, and earnestly summarize experience to form effective working methods.

Conclusion and Recommendations

This study found that BP students had a low level of creativity, and when exploring the reasons for their low creativity, it was found that students only want to get the credits or get awards from the competition when they participated in the "second classroom". Lacking of communication among group members led to a low level of knowledge sharing, while student work engagement and individual initiative were not strong enough as well.

For improving the students' creativity, intrinsic motivation, knowledge sharing, student work engagement and individual initiative, ODI interventions including, appreciative inquiry, goal setting, group dynamics, and team building were used. Through these interventions, students are more engaged in expressing their views more confidently, accepting new ideas, communicating more actively in activities, and improving their teamwork efficiency. They also take the initiative to discuss problems encountered among themselves, devote more time and energy to solve problems, and have the courage to challenge tests.

Quantitative research results show that intrinsic motivation, knowledge sharing, student work engagement and individual initiative have an impact on students' creativity. Intrinsic motivation and student work engagement can also influence knowledge sharing. This means intrinsic motivation and student work engagement can influence creativity by knowledge. Comparing the changes of students' creativity, intrinsic motivation, knowledge sharing, student work engagement and individual initiative before and after ODI, it is found that students' creativity, intrinsic motivation, knowledge sharing, student work engagement and individual initiative are all improved after ODI. It proves that ODI is effective. The results of qualitative analysis can also show the ODI improve students' intrinsic motivation, knowledge sharing, student work engagement and individual initiative, which lead the enhancing of students' creativity.

The findings indicated: First, student creativity can be influenced by intrinsic motivation, knowledge sharing, student work engagement and individual initiative. Second, there are significant differences between the pre-ODI and post-ODI on students' creativity, intrinsic motivation, knowledge sharing, student work engagement and individual initiative. Third, knowledge sharing as the mediator enhanced the influence of intrinsic motivation and student work engagement on the dependent variable.

Recommendations and Implication

According to the actual condition of the study, the recommendations have been proposed for BP to enhance students' creativity are:

1. Offer students diverse learning opportunities, including various learning methods such as online learning, hands-on experience, sharing, competitions, etc. It will enable students to explore their interests, accumulate knowledge, improve skills, and form innovative abilities.

2. Create a conducive atmosphere for innovation by organizing creative activities, encouraging student participation, and creating opportunities for learning and exchange. BP should establish a student council to consider students' opinions and feedback. An open learning environment that allows students to communicate, share, and collaborate should also be built. These measures will promote a positive learning atmosphere that stimulates students' innovative ability and creativity.

3. Focus on practical teaching and encourage students to explore and innovate. Practical experience will enable students to better master skills and knowledge and, at the same time, enhance their ability to innovate. BP should prioritize practical teaching and facilitate practical projects, courses, and activities that allow students to explore innovation in practice. Additionally, students should be encouraged to explore innovative thinking on their own. Through innovative thinking training, students learn to ask questions, think independently, and translate their ideas into practical action, which is essential for their future careers.

4. Strengthen interdisciplinary teaching to enhance communication and integration between disciplines, thus stimulating students' innovative thinking. The study found that students from different majors participating in ODI activities can promote interdisciplinary cooperation, a crucial aspect of innovation.

Researchers believe that unique subjective initiatives should be brought into play to improve individual creativity. Personal solid initiative will enable individuals to participate in creative activities actively, overcome difficulties in the innovation process, and take the initiative to learn new knowledge and exchange new ideas, thus stimulating individual innovation. This approach provides a new way to cultivate individual creativity, giving full play to personal subjective initiative to carry out innovative activities instead of relying on external pressure to involve individuals in creative activities passively. This idea can be extended to other industries and fields to promote innovation in related industries.

Limitation of the Study

It is necessary to acknowledge the limitations of this study, which are as follows:

1. Since students have limited time in school, especially the time to carry out activities can only be arranged in spare time, so the first limitation of this research is that the time is short and the continuity is good, which may influence the actual effect of ODI activities.

2. As the object of this study is students, compared with people in other fields, students are more likely to accept the arrangement of teachers, which makes the conclusion of this study have certain limitations in other fields, especially in the workplace.

Suggestions for Future Research

This study is subject to the constraint of limited research time and human resources, necessitating a focus on a select period during which intervention activities for small groups of students can be completed. The objective of this research is to enhance students' creativity as well as improve their comprehensive quality. Moreover, it is imperative to include teachers as an essential factor in future research to achieve effective teaching and learning outcomes. Additionally, future research should concentrate on enhancing ODI-related activities and developing a suite of activities tailored to different groups, promoting creativity in diverse settings.

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