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To improve Student Engagement in Vocational Education: An Action Research of Beijing Polytechnic in China

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Abstract

This action research aimed to enhance student engagement by fostering students' interest, attention, relevance, confidence, and interaction. There were three objectives of this research: to investigate the current situation of major of art and design student engagement at Beijing Polytechnic (BP); to design and implement appropriate ODIs (Organization Development Interventions) to develop student engagement; to determine the differences in students' interest, attention, relevance, confidence, interaction, and student engagement between pre-ODI and post-ODI. The sample was 68 students from the School of Art and Design majoring in media design at BP. The quasi-experiment group was exposed to ODIs. The same questionnaire was administered before and after ODI to determine the change level. A mixed methods research was adopted to analyze the data and test the hypotheses. The paired-sample t-test demonstrated whether there was a statistically significant difference in five variables between pre-ODI and post-ODI. The ODIs implemented in this current research included appreciative inquiry (AI), goal setting (GS), differentiated instruction (DI), and team building (TB). The qualitative analysis was conducted to analyzing AI, TB, DI, GS reflection report, and classroom observations used ATLAS.ti software program. Findings from qualitative research methods proved improvement in all variables between the pre-and post-ODI. Based on the findings, critical recommendations concerning the enhancement of student's interest, attention, relevance, confidence, interaction, and engagement in the BP were put forward to sustain the momentum. Also, recommendations for future research were discussed.

Keywords: Organization Development Intervention, Student Engagement, Interest, Attention, Confidence, Interaction, mixed methods research

Introduction

With the development of the global economy and technology, two kinds of talent demand are surging: the knowledge talents who develop technology and equipment and the skilled talents who master technology and equipment (Wu, 2004). In this context, all countries have a consensus: if there are only knowledge-based talents and advanced development ideas

without skilled talents, it is impossible to successfully transform ideas into products that humans can utilize, and the skilled talents rely on vocational education (Hu, 2015).

As an independent form of education, vocational education is produced in response to the needs of scientific progress and economic development. Vocational education can greatly reduce the unemployment rate, increase school enrollment, protect socially disadvantaged groups, promote the redistribution of social wealth, and help achieve social justice's vision (John & Ferran, 2004). Vocational colleges are the units of vocational education. The teaching quality of vocational education is directly related to the quality of talents delivered to society. China points out in the Outline of the National Medium - and Long-term Education Reform and Development Plan that improving the quality of vocational education is the core of national vocational education reform and development (Ministry of Education of the People's Republic of China, 2019). Classroom teaching is the main channel for vocational colleges to fulfill the education function. It plays a key role in training skilled and diversified talents for enterprises, inheriting technical skills, and promoting employment and entrepreneurship. Students' cooperation and engagement are core factors that will impact learning effectiveness (He, 2018). However, there are still many problems and challenges in vocational education classes. Beijing Polytechnic is a public independent higher vocational college organized by the Beijing Municipal People's Government. The school 's career development has reached a new level in recent years. Although the school has greatly developed recently, it also faces some challenges.

Research Problem

The researcher conducted preliminary diagnosis by using the semi-structured interview method and questionnaire. The interview sample for students contained 11 students from the College of Art and Design. The questionnaire was designed based on the results of the first interview and launched in the School of Art and Design. 600 copies were issued, and 475 (87 freshmen, 166 sophomores, and 222 juniors) copies were effectively recovered. Most interviewees mentioned poor classroom discipline, weak self-control, feeling that what they have learned is useless, lack of self-confidence, and low-class engagement. Based on the preliminary diagnosis and SWOT analysis, five most serious problems were identified in interest, attention, relevance, confidence, and interaction, therefor the research problem is:

Considering that students in BP generally had low interest, attention, relevance, confidence, interaction and student engagement, this research aimed to enhance student engagement by fostering students 'interest, attention, relevance, confidence, and interaction through organization development intervention (ODI).

Research Objectives

1. To assess and analyze the current situation of students' interest, attention, relevance, confidence, interaction, and student engagement in the vocational college of the School of Art and Design.

2. To design and implement appropriate organizational interventions to improve students' interest, attention, relevance, confidence, interaction, and engagement.

3. To determine the differences in students' interest, attention, relevance, confidence, interaction, and engagement in class between pre- and post-ODI.

Research Questions

1. What is the current situation of students' interest, attention, relevance, confidence, interaction, and student engagement in the vocational college of the School of Art and Design?

2. What appropriate ODIs can be developed and implemented to enhance students' interest, attention, relevance, confidence, interaction, and student engagement?

3. What are the differences in students' interest, attention, relevance, confidence, interaction, and engagement between pre- and post-ODI?

Literature Review

Interest

Learning interest is an activity with positive emotions generated based on striving to understand the world and constantly seeking truth. Students can learn the memory content quickly and firmly when interested in learning (Pan Shu, 2001). Herbart was the first educator who defined the concept of interest and studied it as an educational science category. According to Herbart, interest arises when activity is no longer motivated by desire. Herbart divided human interest into two categories: emotional interest and cognitive interest (Herbart, 1895; Rong, 2007).

Attention

Attention refers to the extent to which the student’s curiosity is aroused, gained, and sustained over time (Wongwiwatthananukit, 2015). It is the ability to focus on the task at hand and not be disturbed by external things when a person is doing something. Students' attention is mainly reflected in that they can listen and think carefully in class, do not play mobile phones or sleep, and will not be interfered with by the outside world (Chen, 2020).

Relevance

Relevance refers to the student’s perception that the instruction is related to personal/career needs or goals (Wongwiwatthananukit, 2015). It is a prerequisite to attract students. Dealing with real or class problems will increase students' interest and build a purposeful learning experience (Claxton, 2007; Dunleavy et al., 2010; Willms et al., 2009). The work that students do also needs to be relevant, meaningful, and real. In other words, it needs to be worth their time and attention (Willms et al., 2009).

Confidence

Self-confidence is a student's belief or trust in performing something successfully (Kanza, 2016). According to Perkins (2018), self-confidence is related to success, achievements in education, conciliation, and a person’s well-being, among other things, and self-efficacy, self-esteem, and self-compassion are the three factors that can affect any individual's self-confidence level. Confidence also refers to the student’s perceived likelihood of success through personal efforts and control (Wongwiwatthananukit, 2015). High self-confidence manifests as high self-evaluation, good academic performance, and appearance affirmation (Jiang et al., 2008).

Interaction

Classroom interaction includes all the communication and influence between teachers and students in the specific classroom environment to achieve the teaching goals through teaching content (Ye & Pang, 2001). Classroom interaction is reflected in the classroom as students actively ask questions to the teacher, return to the teacher's questions, and communicate with each other and discuss problems (Ye & Pang, 2001).

Student engagement

According to previous studies, engagement can be divided into behavioral engagement, emotional engagement, agentic engagement, and cognitive engagement (Fredricks et al., 2004; Furlong et al., 2003; Jimerson et al., 2003). ①Behavioral engagement, students' observable actions such as nodding, raising hands, answering questions, etc.; ②Emotional engagement, it refers to the connection between emotional with teachers and classmates (Jimerson et al., 2003). Composed of positive and negative emotions; ③Agentic engagement, students can participate in the whole classroom teaching process, such as asking questions in class and expressing their interests and ideas (Reeve, 2013); ④Cognitive engagement, it refers to the ability to focus on solving complex problems while learning difficult knowledge (Blumenfeld et al., 2005; Furlong et al., 2003) (Skinner & Pitzer, 2012).

Organizational development interventions

Appreciative inquiry (AI)

Different from the traditional OD research method based on finding problems and solving problems, AI emphasizes the research advantages, appreciates the advantages, gives full play to the advantages, describes the ideal vision, and encourages all relevant members to discuss and decide the goal, set the route, and reflect on the route design(Cooperrider & Srivastva, 1987). The commonly used theoretical model in AI is the 4D model, which includes discovery, dream, design, and destiny.

Goal setting (GS)

Previous studies have shown that GS is effective for organizational intervention (Cumming & Worley, 2014). According to Tabrizi and Terrell (2013), goals enable us to take fewer detours, to be more rational in the face of our true selves, and to make corresponding plans to combine goals with personal growth. In this study, SMART (Locke & Latham, 1990) was used.

Differented instruction (DI)

DI pays more attention to imparting knowledge and answers, and the implementation of differentiated instructions is usually based on the attention paid to students (Tomlinson, 2017). Students are an independent individual and a part of the classroom. Only by paying attention to the knowledge mastery of the whole classroom can an active classroom atmosphere and effective knowledge impartation be guaranteed.

Team building (TB)

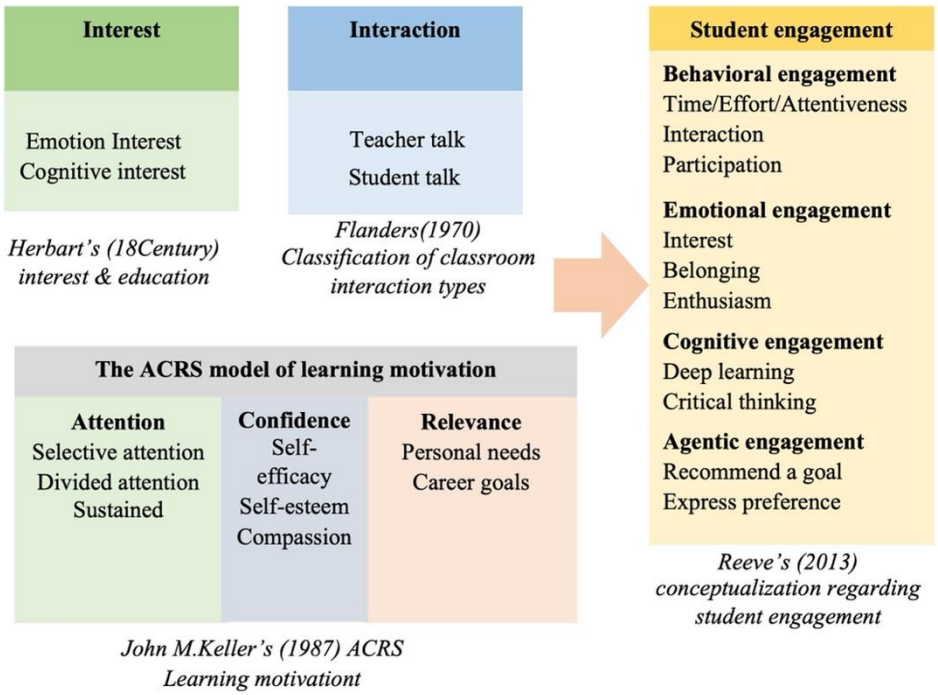
In previous studies, TB has been proven to improve the communication power, cohesion, and problem-solving ability of the team (Cumming & Worley, 2014). In this study, teachers used a four-step process: formation, storming, specification, and execution (Tuckman, 1965).

Theoretical framework

Figure 1 shows the framework. Independent variables are students' learning interests, attention, relevance, confidence, and interaction. The dependent variable is student engagement. According to the concept of student engagement proposed by Reeve (2013), student engagement includes behavioral engagement, emotional engagement, cognitive engagement, and agentic engagement. The selection of these variables is based both on the results of the preliminary diagnosis and SWOT analysis, as well as on the discussion of theory and research.

Figure 1

Theoretical Framework

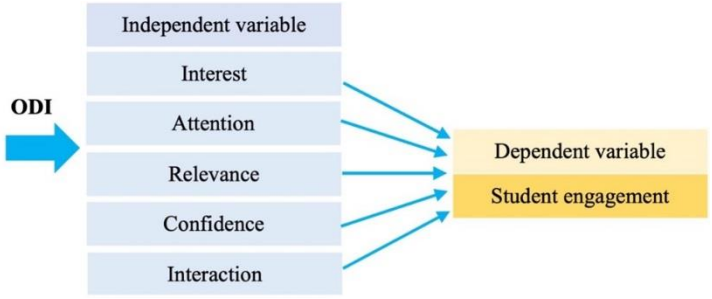


Conceptual framework

Figure 2 shows the independent variables and dependent variable.

Figure 2

Conceptual Framework

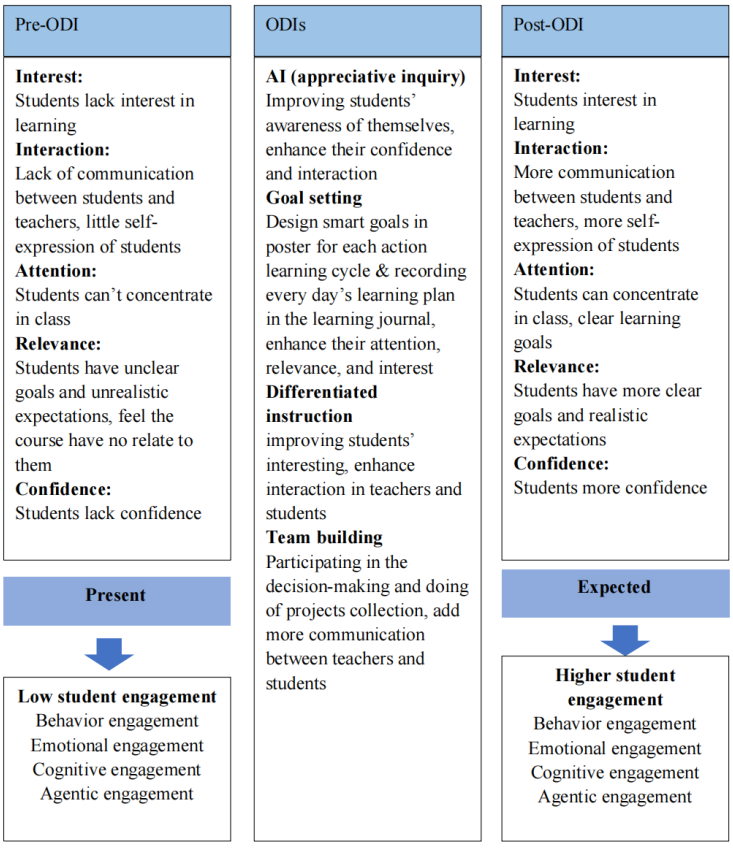


Action research framework

Based on the problems identified during the pre-ODI stage, the researcher designed five organization development interventions on enhancing teaching effectiveness to improve the variables. Figure 3 shows the framework.

Figure 3

Action research Framework



Research Methodology

Research Hypotheses

H1o: The difference in students' interest between pre- and post-ODI is insignificant is insignificant.

H1a: The difference in students' interest between pre- and post-ODI is significant.

H2o: The difference in students' attention between pre- and post-ODI is insignificant.

H2a: The difference in students' attention between pre- and post-ODI is significant.

H3o: The difference in students' relevance between pre- and post-ODI is insignificant.

H3a: The difference in students' relevance between pre- and post-ODI is significant.

H4o: The difference in students' confidence between pre- and post-ODI is insignificant.

H4a: The difference in students' confidence between pre- and post-ODI is significant.

H5o: The difference in students' interaction in class between pre- and post-ODI is insignificant.

H5a: The difference in students' interaction in class between pre- and post-ODI is significant.

H6o: The difference in student engagement in class between pre- and post-ODI is insignificant.

H6a: The difference in student engagement in class between pre- and post-ODI is significant.

Research design

The study is action research adopted mixed methods research containing qualitative an d quantitative research. The researcher applied questionnaires (quantitative research), intervie ws, self-reports, classroom observation, and reflective statements (qualitative research) in this research. The study involved 68 sophomores majoring in media design in BP.

To test the validity of the above questionnaire before it was administered to the subject of the current study, the researcher sought five experts (Ph. D holders, 2 experts in OD, 1 expertise in art and design, 2 experienced in vocational College education). Five professors gave scores, and the result showed that items 8, 13 and 16, the average score is 0.8, and others, the average score was +1.

To test the reliability of the questionnaire, 32 respondents participated in the pilot test. After 32 respondents finished the questionnaire, the data were analyzed by Research Technic by SPSS to test reliability, and the internal consistency of Cronbach's alpha = .971 (interest), = .956 (attention), = .933 (relevance), = .930 (confidence), = .975 (interaction) = .991 (engagement) were good.

Research sampling

The participants in this study were 68 sophomores majoring in media design from BP. The author chose to conduct OD intervention for sophomore-year students since the fresh pers on-year students take basic courses and less professional courses, and the junior-year students mostly practice outside the school. The 68 participants were between 18-25 years old, with a balanced male-to-female ratio, all participants constituted the quasi-exper imental group (N=68) and participated in all OD intervention processes.

Procedure

Pre-ODI stage

The researcher used a semi-structured interview to analyze BP's organization and vocational college classroom teaching and learning situation. The 11 students in the School of Art and Design were interviewed to understand the overall situation of curriculum teaching, and problems were identified by this stage. The preliminary diagnosis questionnaire was designed and focused on attention, self-control, classroom interaction, learning interest, learning goals, and achievement to examine problems below the surface problems. 475 students answered the online preliminary diagnosis questionnaire to measure the current situation of teaching and learning. The result showed problems in BP class were low interest, attention, relevance, confidence, and engagement.

After preliminary diagnosis, the researcher designed the experiment questionnaire based on the preliminary diagnosis results, the questionnaire passed the validity and reliability test, and 68 students in the quasi-experiment group answer the questionnaires. The semi-structured interview and teacher observation also took in this process.

ODI stage

Based on the results of the pre-ODI phase, the appropriate OD intervention AI, GS, DI, and TB were designed, and the ODI process and objectives are shown in Table 1.

Table 1

OD intervention design program

ODI Activities	Time	Objectives
AI	2023.6.19 (2 Hours) 2023.6.20 (2 Hours)	● Have a vision ● Set a goal, and design a path to reach it
GS	2023.6.26 (2 Hours)	● Know true oneself ● Set reasonable goals ● Develop actionable plans ● Optimization objective ● Obtain the way to achieve the goal
DI	2023.6.-2023.8 (Each unit)	● Know themselves ● Increase interaction ● Increase confidence ● Increase engagement
TB	2023.6.18,20,23,28	● Better understand each other ● Improve the self-reflection, interaction, and self-confidence

Post-ODI stage

The same set of questionnaires will be administered again to the quasi-experiment group to test whether there is any significant difference before and after ODIs. At the end of ODI, participants will complete the reflection report.

Data collection and analysis

This study adopts mixed methods research data from the quasi-experiment group in pre- and post-ODI. In the quantitative research part, the researcher collected data via questionnaire and analyzed the data by standard deviation, mean value, and paired-samples t-test by SPSS.

In the qualitative research part, the researcher collected data through interviews, reflection pa per, and observation then analyzed the data by ATLAS.ti software.

Results

Data analysis through qualitative and quantitative analysis shows that ODI positively i mproved students' interest, attention, relevance, confidence, interaction, and class engagemen t. The average scores of all variables in survey were statistically improved and verbal comme nts of students, feedback from observers, and reflection paper showed positive improvement between pre-and post-ODI. The specific analysis is as follows:

Pre-ODI

Based on the results of qualitative analysis, researchers found that students generally c annot concentrate in class, have low self-confidence, not interested in learning, do not interact with teachers, and do not know what they want to do in the future. These phenomena lead to low student engagement in class. And the quantitative analysis results can be seen in table 2, based on the theory of Creswell, 2009, scores can be divided into three grades: low, moderate, and high, and the scores pre-ODI was in low level.

Table 2

The current situation of students 'interest, attention, relevance, confidence, and engagement

Content	Mean	SD
Interest	2.78	0.72
Attention	2.83	1.04
Relevance	2.98	1.12
Confidence	2.87	1.21
Interaction	2.65	0.97
Engagement	2.66	0.94

The semi-structured interview contained 12 questions, during the pre-ODI period, most interviewees mentioned that they were not participate in class. According to the answers related to interest, they thought learning was very boring and people around them did not study. In addition, some interviewees said that the study atmosphere in the class is not good, and few students were interested in learning; According to the answers related attention, they also could not concentrate their attention and often slept or played mobile phones in class; According to the answers related relevance, they did not know what abilities they needed to find a good job; According to the answers related confidence, they did not have the confidence to overcome difficulties and chose to withdraw and give up when they encountered challenges; According to the answers related interaction, they had less interaction in class, could not keep up with the teachers' pace, and were reluctant to express their views, let alone be noticed; According to the answers related engagement, they felt bored in class and they could not participate well.

Three teachers made observations in class. They mentioned in the observation report that: many students played mobile phones or sleep in class, the phenomenon of tardiness was common, some students chatted in class and even interfere with other students, no students answered the questions raised by the teacher, the atmosphere was very awkward, and there was very little interaction between teachers and students.

ODI

According to the early diagnosis, four OD interventions AI, GS, DI, and TB were conducted to solve these aforementioned problems.

According to the early diagnosis, students' self-confidence was weakened. After the AI process, the results show that students can set goals, enhance confidence, and increase engagement in class.

In the preliminary diagnosis, students had no goals and did not know what ability they needed to have in the future. After the GS process, the results show that students can set clear goals and desires for the future, increasing their relevance, interaction, and engagement.

In the initial diagnosis, students mentioned that they could not keep up with the pace of the teacher's class and chose to give up. After the DI process, the results show that students want to communicate with teachers, and their confidence is increased.

According to the early diagnosis, students could not communicate well with their classmates and teachers. After the TB process, the results show that students interact more with teachers and classmates, increasing their confidence.

Post-ODI

In quantitative analysis, the researcher conducted the same survey before and after OD I. the paired-sample t-test tested the results of the hypothesis to determine the difference between the mean before and after the ODI. The Sig value of variables were less than 0.05. This information implies that ODI has a significant improvement in students' attention, relevance, confidence, interaction, and engagement, as shown in Table 3.

Table 3

Difference of variables between pre- and post-ODI

NO.	Item	Mean	SD	Mean Difference	*t*	*p*
1	Interest-post	4.27	1.06	1.49	9.13	0.00
	Interest-pre	2.78	0.72			
2	Attention-post	4.30	0.71	1.47	9.44	0.00
	Attention-pre	2.83	1.04			
3	Relevance-post	4.43	0.70	1.45	8.94	0.00
	Relevance-pre	2.98	1.12			
4	Confidence-post	4.38	0.85	1.51	9.78	0.00
	Confidence-pre	2.87	1.21			
5	Interaction-post	4.33	0.75	1.68	11.01	0.00
	Interaction-pre	2.65	0.97			

$p<0.05$

In qualitative analysis, the semi-structured interview contained 12 questions were used to help tests the results of the hypothesis, the results showed that students' attention, relevance , confidence, interaction, and engagement were enhanced after ODI.

Interest

The semi-structured interview contained 2 questions in interest:

Q1: Can you describe your current interest in learning?

Q2: Do you try to keep yourself interested in learning?

Respondents said that learning was not such boring, and learning majors well was help ful to future academic improvement and finding a good job, and they would try to make them selves interested in learning.

Therefore, H1o: There is no significant difference in students' interest between Pre-OD I and Post-ODI is rejected.

Attention, Relevance, Confidence (ARC)

The semi-structured interview contained 6 questions in ARC:

Q3: Are you paying attention during your study?

Q4: Do you control your attention?

Q5: Do you know what kind of ability is needed to find a good job?

Q6: Do you think what you are learning in class is relevant to the future?

Q7: Are you confident?

Q8: Did you encounter difficulties and setbacks in the learning process? Did you give up?

Respondents mentioned that they were paying more attention to their attention, more a ware of the relationship between the knowledge they have learned in class and the skills they should have in the future, and more confidence to face difficulties and accept challenges.

Interaction

The semi-structured interview contained 2 questions in interaction:

Q9: Do you often interact in class?

Q10: Do you have a good relationship with your classmates or teachers?

Respondents mentioned that they were more willing to communicate with teachers an d classmates and were more inclined to express their ideas.

Engagement

The researcher conducted the same survey before and after ODI for each question wer e 16 pairs of students' engagement. The differences in the results of the paired-sample t-test an d the mean score of students ‘interests before and after ODI were summarized as follows the r esults were shown in Table 4.

Table 4

Difference of student engagement between pre- and post-ODI

Item	Mean	SD	Mean Difference	*t*	*p*
Behavioral Engagement-post	4.36	0.92	1.73	11.46	0.00
Behavioral Engagement-pre	2.63	0.77			
Emotional Engagement-post	4.45	1.00	1.77	11.77	0.00
Emotional Engagement-pre	2.68	0.67			

Item	Mean	SD	Mean Difference	*t*	*p*
Item	**Mean**	**SD**	**Mean Difference**	***t***	***p***
Agentic Engagement-post	4.38	1.01	1.78	11.86	0.00
Agentic Engagement-pre	2.60	0.70			
Cognitive Engagement-post	4.39	1.03	1.65	11.11	0.00
Cognitive Engagement-pre	2.75	0.65			
Engagement-post	4.40	0.94	1.73	12.12	0.00
Engagement-pre	2.66	0.67			

$p<0.05$

The semi-structured interview contained 2 questions in engagement:

Q11: Can you describe your current study situation?

Q12: How do you feel in class?

Respondents mentioned that their learning status in class changed to be better, and the y could participate in class well, and the class was much more interesting.

In conclusion, as for students' interest, participants mentioned in interviews and observations that they had a new understanding of learning, realized that learning interest can be cultivated, and were more willing to enhance their interest in learning. In terms of attention, participants mentioned that they were paying more attention to their attention, and they began to consciously control their attention and try to minimize external distractions. In terms of relevance, participants were more aware of the relationship between the knowledge they have learned in class and the skills they should have in the future, and they were also aware of the fierce competition in the future, so they should lay a good professional foundation. In terms of self-confidence, students have increased self-confidence and were more willing to face difficulties and accept challenges. In terms of classroom interaction, students were more willing to communicate with teachers and classmates in class and more willing to express their ideas. They liked the current classroom atmosphere very much. In terms of class engagement, students could better integrate into the class and better apply what they have learned in real life. Students felt the classes interesting and were more willing to come to class.

Three teachers made observations in class. They mentioned in the observation report that: after ODI, the number of students played mobile phones or slept in class was significantly reduced, the phenomenon of students discussed learning with each other in class increased, and the interaction between teachers and students also increased.

Based on the qualitative and quantitative analysis results, all null hypotheses H1o- H6o were rejected. Therefore, after implementing ODIs, positive significant mean difference in all variables was proved.

Conclusions

This study aims to investigate the current situation and improve on student's interest, attention, relevance, confidence, interaction, and engagement of the School of Art and Design at BP. Based on the preliminary diagnosis, ODI including AI, GS, DI, and TB were chosen and implemented. Quantitative and qualitative analysis were utilized to achieve research objectives.

The semi-structured interview results, reflection paper, observation, and paired-sample t-test proved that the ODIs improved all variables, and the significance values of the survey data are less than 0.01, indicating a statistically significant difference before and after ODI. That is, the ODI fostered student's interest, attention, relevance, confidence, interaction, and class engagement.

Discussion

To accomplish the first research objective, the researcher found several existing problems through preliminary research: students generally lack interest in learning. They also cannot concentrate and often play mobile phones in class, unconsciously wandering. They do not know the ability to find a job in the future and feel that what they learn now is useless. They lack confidence and do not believe they can face challenges. Students rarely interact in class. They are not good at expressing their ideas and don't want to be in the spotlight. Student engagement in class is low, most are not interested in the content taught in class, and less interaction with teachers and classmates.

To accomplish the second research objective, the researcher designed ODI based on the preliminary diagnosis, literature review, and vocational college students' characteristics. It contains AI, GS, DI, and TB.

1. Previous literature points out that AI tools can enhance participants' self-confidence, increase participation, and help form a good working atmosphere. After interventions, students mentioned in their reports that their self-confidence has been enhanced, the classroom atmosphere is good, and they are more willing to engage in the class.

2. GS influences people's thoughts and behaviors by focusing their behavior on the direction of goals (Cumming & Worley, 2014). After the intervention, students mentioned in their reports that they understood themselves better, set reasonable goals, began to search for recruitment information online, and were willing to work hard toward their goals.

3. It has been shown in previous research that DI can improve student engagement in learning (Feng & Kim, 2020). After interventions, students reported that they could keep up with the teaching progress and had a stronger grasp of knowledge. Therefore, their self-confidence was enhanced, and they were more willing to communicate with teachers and classmates.

4. Previous literature has shown that TB can reduce team members' apathy, lack of interest, and other factors, helping members enhance interpersonal and problem-solving skills." (Cumming & Worley, 2014). Feng and Kim (2020) believe that TB can improve student engagement. After interventions, students mentioned in their reports after the team building intervention that they had a more harmonious relationship with their classmates and teachers and were more willing to communicate with them.

These findings are aligned with quantitative research data. In this research, the findings supported the same or similar results of relevant studies done by previous researchers. The quantitative analysis for variables with a sig value less than 0.5 proved that students' interest, attention, relevance, confidence, interaction, and engagement were improved after ODI. The findings are consistent with the previous literature that ODI can enhance participants' interest (Cumming & Worley, 2014), attention (Feng & Kim, 2020; Tomlinson, 2017), relevance (Feng & Kim, 2020; Tomlinson, 2017), confidence (Feng & Kim, 2020), interaction (Cumming & Worley, 2014; Tomlinson, 2017; Windham, 2005), engagement (Cumming and Worley, 2014; Feng & Kim, 2020).

The students' reflection reports mentioned that they actively cultivated their interest in learning and worked hard to concentrate. These behaviors have obvious changes in students. The research report of the three observation teachers also proved that the number of students

who are late for class, sleep, and play with mobile phones has decreased.

Based on the discussion above, ODI has been used in the field of vocational college settings and has a positive impact on college students. This research results not only strengthen the positive role of ODI in education but also demonstrate the application of ODI in a new educational field - vocational education. Therefore, this current research can serve as a reference for improving classroom participation in vocational education. Future researchers can conduct in-depth research in different settings of vocational colleges and may form a scalable model that can be applied in different vocational education schools.

Recommendation

After ODI, the school has particularly become keen to maintain the continuous development of the classroom learning atmosphere with higher student engagement. It requires the college supervisor to check the classroom frequently. To maintain the continuous development of the classroom for active student engagement, the researcher suggests the following:

Recommendations for schools

1. Improve teachers' OD capability. Schools should provide OD-related training to teachers to improve their OD capability. It would be useful for schools to organize events where teachers can discuss and share how to integrate OD methods into the curriculum better to improve student participation in the classroom.
2. Improve students' interest and confidence. Schools should create more student associations to help them find their interests and strengths. By succeeding in what they are interested in, they can increase their self-confidence and experience the power of their interest.
3. Strengthen the communication between teachers and students. Schools can organize more activities that both teachers and students can participate in. Through cooperation in activities, teachers and students can understand each other's needs and expectations, strengthen understanding, and narrow the gap.
4. Organize seminars and workshops related to career planning for students so that students can better understand what is required of graduates in future jobs and the relevance of their major learned now to future careers.

Recommendations for students

1. Self-exploration. The current research found that students generally lack self-confidence and lack interest in learning. Students should first know themselves regarding their strengths, interests, and weaknesses. Based on this, students can plan how to improve their self-confidence gradually.
2. Self-control training. Due to the poor learning habits of students, students can be recommended to read some books and videos related to self-control. Teachers can also encourage them to participate more in class activities to strengthen their self-control ability and attention.
3. Self-improvement. Students should be aware of the requirements put forward by the current society for vocational college students. Students should actively improve various skills to be better prepared for their growth.

Recommendations for teachers

A comfortable classroom atmosphere can increase classroom interaction, improving students' attention and engagement. Teachers should organize more interactions with students, strengthen the communication between teachers and students, and encourage students more. This way, the distance between teachers and students can be narrowed, and they can clearly know each other’s needs and expectations. It is helpful to create a proactive engagement and a

comfortable classroom atmosphere.

Limitations of the study

There are some limitations to this study. First, due to time and class setting, the sample size of this study is not large, and it is only conducted in the College of Art and Design. Secondly, the quality of the classroom is closely related to the teacher's teaching design. However, the current research only collected student data and did not collect and analyze teachers' teaching behavior. Third, due to the limited intervention time, the current research focuses only on the change level of independent variables and dependent variable, before and after ODI. The research has not proved a causal relationship between independent variables and dependent variables.

Recommendations for future research

This study's interventions were only conducted for a short period. While the intervention appears to improve in variables, its sustainability remains uncertain. To verify the long-term effects of the intervention, future studies need to create longer intervention timelines and examine the effects of the intervention through ongoing observations and interviews with students.

The current study was conducted at the College of Art and Design, with samples from media design majors. Compared with students of other majors, students from the School of Art and Design are more creative but less logical, so the results of this study may be less applicable to students of other majors. Future researchers should consider choosing vocational college students with more general majors and a larger sample size to broaden the applicability of the findings.

This study only studied students and the chosen variables. Future studies can expand to teacher-related variables and design different ODIs to improve student engagement. In this way, the research can shed light on both students' and teacher's side as a whole.

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