An action research on developing intercultural competence of international virtual team

Qi Wang [1*]

Abstract

Purpose: With increasing need of using international virtual team in higher education institute, especially at the post-pandemic stage, the purpose of this action research is to investigate appropriate organization development interventions for developing intercultural competence of international virtual team. **Research design, data and methodology:** This action research is conducted at a private higher education institution in China. 45 students majored in Business are chosen by purposive sampling for organization development intervention stage. Mixed methods are applied at the pre-and post-ODI stage. A well designed questionnaire is firstly delivered to 200 respondents to test the relationship between variables by multiple linear regression before Pre-ODI stages. The questionnaire and semi-structured interview are conducted at both pre-and post-ODI stage. Paired sample T-test and content analysis are used for data comparison between the Pre-ODI and Post-ODI stage. **Results:** The results from multiple linear regression support the significant impact between variables. And the key findings represent that there is a significant difference between Pre-ODI and post-ODI stage for reflective learning, knowledge sharing, cognitive competence, affective competence and behavioral competence. **Conclusions:** The action research proves that the collaborative learning can be seen as the effective strategy to developing intercultural competence of international virtual team.

Keywords : Collaborative learning, Intercultural competence, Knowledge sharing, Reflective thinking, International virtual team

JEL Classification Code: C12, M12, O15

1. Introduction[1]

Under the outbreak of pandemic, the director of the Department of higher education of the Ministry of Education of China, Wu Yan highlighted the inevitable tendency of international virtual education platform, and gave the directional strategy for future in 2020. The international virtual platform current serves as an option when the global mobility interrupted by the pandemic, however it could be a optimum consideration when the world back to normal situation, it might bring changes to higher education globally. It is the responsibility of Chinese higher education institution to explore and research on how to make international virtual communication temporary replacement a sustainable development.

With the growth of economic globalization and culture diversity, the competition for job career brings challenging requirement to the university graduates. Increasing students' competitive employability became the top concern for higher education institutions. Yang and Liu (2013) proposed that when facing the fast development of internationalization, the intercultural competence has been brought under the top consideration. Therefore, universities

---

1 *Qi Wang, Lecturer of International Business School, Heilongjiang International University, China. Email: wangqi1201@hiu.net.cn

should concentrate on research programme and teaching activities for cultivating students' various competences. Monash University Intercultural lab conducted research on online learning and working globally triggered by increasing globalized reality. Accordingly, universities should raise the awareness for this situation, and build this competence into employability skill mix.

China nowadays is known as the world's largest international trading country and the second largest consumption market. With the strategy of reform and opening up and "the belt and road initiative", the economic and cultural exchanges with other countries will be further developed in the future. Hu (2020) put forward that from the strategic cooperation between the two governments to the business negotiation between enterprises, achieving relevant professional skills and being familiar with the laws and regulations of each other's countries are becoming the basic requirements for cooperation; when developing deeper and broader cooperation, it is a need to understand the thinking patterns, traditional concepts, social customs and communicative styles of different culture background, so as to embrace diversity and reach common ground at the same time reserving differences and developing together. These above obviously require people with intercultural competence to achieve. Therefore, the illustrated background triggered the research on the intercultural competence through virtual platform.

1.1. Focal organization

1.1.1. School profile

Established in 1993, Heilongjiang International University (HIU) is a private university approved and accredited by State Ministry of Education of China. HIU located in Harbin city, northeast of China, is the only language-oriented university in Heilongjiang province. In the year 2021, HIU ranked 8th among Chinese private universities by the Alumni Association; and rated as a 6-star world-famous private university, ranks 1st of Chinese private language-oriented university in 2021. "Institutionalization development, application-oriented and students-centered, language plus profession" are the strategic positioning of HIU. There are 10 academic schools covering 30 majors currently, and 3 departments for public teaching. The students in business related major actually from three schools. The chosen experimental group is from International Business School (IBS).

1.1.2. Preliminary diagnosis

The preliminary diagnosis came from both primary data and secondary data. Both qualitative method and organization assessment tool have been used for the data collection. It is notable that the preliminary diagnosis focus only on business students, firstly, business students currently in HIU, are provided with more virtual international activities, and secondly, compare with student majored in language studies, the development of intercultural competence can be seen as a weakness for business students. These can be considered as the reasons why this research chose business students as the research targets. From observation on virtual platform that students participated, interviews of students and teachers involved in IVT, and some performance feedback from third party, here are some current symptoms for business students needed to be improved.

Situation 1: Students never switch on the camera if they are required to.

Situation 2: Students seldom interact actively, only few students interact, normally students interact because their interaction will be counted in their performance assessment.

Situation 3: The English language students communicated (spoken and written) is inappropriate.

Situation 4: the overall atmosphere of virtual communication is quite and embarrassed, many misunderstanding appeared, and students are not willing to join the IVT activity.

Accordingly, the interviews with students and other participators of IVT has conducted for collecting the reasons after these situations. Students are aware of the precious learning chance to join the IVT, they have the right attitude and willingness of participation. Somehow, they have no idea about how to communicate and behave to overcome their personal issues and achieve the expected outcomes. And they also feel the virtual circumstance make the cross-culture communication more challenging, it is stressful to switch on the camera and interact actively, sometimes when they meet the situation that they do not understand, they are not confident enough to clarify. Compare with the offline classroom teaching, students have no place to hide, they have to face the situation and overcome the personal issues like being shy or fearful, however, the online situation provide them the chance of hiding behind the screen, this "comfort zone" Intervene the learning outcome obviously.

The researcher invited other experts conducted SWOT and SOAR analysis based on students level, the results also indicate that the urgent need for improving Intercultural competence in as much as the increasing frequency of using IVT in the future, only can it be seen as an effective learning and communicating platform when students acquire intercultural competence.

1.2. Research objectives

- To investigate the impact of collaborative learning on students' Intercultural Competence.
- To assess and analyze the current level of students' Intercultural Competence.
- To design and implement appropriate Organization Development Interventions (ODIs) to improve students' collaborative learning.
- To determine the differences of students' collaborative learning and Intercultural competence between the pre- and post-ODI stage.

1.3. Research questions

- Is there an impact of collaborative learning on students' Intercultural Competence?
- What is the current level of students' Intercultural Competence?
- What are the appropriate Organization Development Interventions (ODIs) to improve collaborative learning
- Are there any differences of students' collaborative learning and Intercultural competence between the pre- and post-ODI phases?

1.4. Significance of the Research

Firstly, this action research can fill the gap for the research related to intercultural competence of IVT. As the virtual platform has been frequently used after the outbreak of pandemic, this research can represent supporting evidence for the future development of IVT in educational field. Especially at the post-pandemic area, can IVT still be considered as an effective way for global activity. Secondly, the significance for students' career and employability development, the outcomes from this action research can make a directive contribution for educators when designing students' competence development with courses and programmes. Thirdly, for higher education to develop students' comprehensive competences, the research provide theoretical and directive reference for improvement of Intercultural competence.

2. Literature Review

2.1. Review of Literature and Related Studies

2.1.1. International virtual team

International virtual team (IVT), also known as global virtual team (GVT), O'Dowd (2018) defined GVT as the group members with different geographic location and

who are requested to collaborate through virtual platform to achieve common goals. IVT have been widely used in Business Education in higher institutions recently, the purpose of IVT is to achieve students' flexibility in communication through technologies (Gavidia et al., 2008), prepares students with required skills for future employment in a globalized context (Trautrims et al., 2016), and meanwhile raise the cultural understanding (Magnier-Watanabe et al., 2017). Students can simulate the experience of future employment through IVT, and the IVT build a learning platform that students can collaborate to have business case study or deliver research projects (Shea et al., 2011; Gonzalez-Perez et al., 2014).

Daim et al. (2012) discuss the complexity of IVT, it is notable that there are many barriers of communicative breakdown in GVT. For example trust, interpersonal relations, culture and language. The challenges brought by these barriers confirm the needs of conducting research.

2.1.2. Intercultural competence

The earliest study related to intercultural competence can be traced back to psychologist Robert W. White (1959), who has described competence as "the ability of organisms to effectively interact with their environment" and put forward that effective motivation should be seen as an integral part of competence. For decades, the studies in many disciplines has provided information for today's IC development status. During 1970s, research has started focus on identifying the key variables in IC based on existing studies. Also assessing the influential ability of variables on IC (Hammer et al., 1978; Ruben & Kealey, 1979). During 1980s, research related to IC continue gaining achievements, a special issued journal called International Journal of Intercultural Relations made a significant contribution. Many studies of IC achieve the conceptualization from interpersonal communication ability, and extending this to the cross-culture background. Spitzberg and Cupach (1984) described the communication competence as "effective and appropriate communication", which has provided significant support to later work in IC. During 1990s, a great process of IC studies has been made based on the achievements given by previous studies.

The definition of IC have reach the agreement by scholars during 2000s, Lustig and Koester (2003) argued that the definition of IC is highly related to the concept of culture. IC is collaboratively formed under a dynamic situation not based only on an individual attribute. It should be viewed as a feature of the interpersonal relation. The situation where an intercultural encounter happens can have the influence on the extent of appropriateness and effectiveness. Deardorff (2006) explained that "the appropriateness can be seen as the avoidance of violating valued rules and effectiveness can be viewed as the

achievement of valued objectives." Lustig and Koester (2003), Chen and Starosta (1996) stressed the importance of certain context, by defining IC as: "the ability to negotiate cultural meanings and to execute appropriately effective communication behaviors that recognize the interactants' multiple identities in a specific environment." Another commonly used definition came from Deardorff (2004), he proposed that the definition as "the ability to communicate effectively and appropriately in intercultural situations based on one's intercultural knowledge, skills, and attitudes." In this research, considering the preliminary diagnosis of focal organization, the definition from Spitzberg and Chagnon (2009) is applied as the explanation of IC, "the appropriate and effective management of interaction between people who, to some degree or another, represent different or divergent affective, cognitive, and behavioral orientations to the world."

There are many studies related to multidimensional aspects of IC developed by scholars over the years. O'Dowd (2006) describes IC from the dimensions of affect, cognition, and skills aspects. Among these variables, it can be concluded that three components reached common consensus based on definitions: the cognitive, affective, and behavioral orientation (Bennett, 2009; Chen & Starosta, 1997; Deardorff, 2006b; Perry & Southwell, 2011). These three domains will be considered as the sub variables in this research to measure students' IC.

The cognitive competence (CC) describes the ability to perceive and interpret information and allows individual to achieve a better understanding of a situation with a range of alternative perspectives (Dodd, 1987). It refers to "individuals' knowledge of the target culture and their appreciation of the differences between their home culture and other cultures" (Hill, 2006).

The affective competence (AC) refers to the individual's feelings, attitudes and personality traits towards to specific cultures and individuals. AC can be seen as the ability allows people to understand aspects such as emotional expressions, aesthetic sensibilities, attitudes, and values of different culture (Gudykunst & Kim, 1997).

The behavioral competence (BC) refers to the cross-cultural adaptability (Kelley & Meyers, 1995), it can be seen as an appropriate set of behavioral skills for varying situations in intercultural interactions (Dodd, 1987) and the ability to communicate effectively both verbally and non-verbally with others (Iles, 1995).

2.1.3. Collaborative learning (CL)

Collaborative learning describes the process of social interaction including a community of learners and instructors, members achieve and share an experience or knowledge (Zhu, 2012). Through CL, members can search for understanding, solutions, or meanings mutually or even create something new together, when they are working in groups. The CL process mostly focus on participators own exploration or application of the learned knowledge, rather than instructor's lecture. It means a significant transformation from the traditional lecture-centered classrooms. In collaborative learning situation, the traditional learning methods such as lecturing, listening, or note-taking process may still apply, but it works with other processes based in discussion and active group work. Instructors who host the collaborative learning processes should consider themselves more as designers of intellectual exchanging experiences, rather than transmitters of knowledge to participators (Smith & MacGregor, 1992). In this research, knowledge sharing and reflect thinking are considered as two sub-variables the of collaborative learning for achieving the desired outcomes.

Knowledge sharing (KS) defined particularly under cross-culture context as "the activities relating to the exchange of meaningful information, along with interpretations and potential applications of the information." It can be seen as the process of collaborate with others to solve problems, develop new ideas, or implement policies or procedures (Ferrari, 2020).

Reflective Thinking (RT) referred as "purposeful thought in which learners engage in active, persistent, and careful consideration of ideas for deeper understanding." RT can be considered as part of critical thinking, it emphases on the processes of analysis and judgment. Learners can be fully aware of and control the learning by actively engaging in reflective thinking (Wilson & Murdoch, 2008).

2.1.3. Organizational Development Intervention (ODI)

Over the past decades, many scholars with different concerns have defined Organizational development. Taylor, Lewin, Bion, and McGregor have given the fundamental explanation of organization development as a process begin with finding out what is actually happening , analyzing the reason of the situation, after collecting all the data and discussed by stakeholders, to provide the solutions for improving people and system.

Burke and Bradford (2005) explained OD as a system-wide process, because the planned changes all based on the clear objectives of improving overall organization effectiveness. Alban and Scherer (2015) has proposed OD as the directive theory of action research of human systems for achieving the internal and external effective outcomes of the organization. OD builds a chance for organizations on identifying and diagnosing current situation, analyzing current context, and reconsidering the strategies, process, structure, and so on.

Organization development (OD) presents the effort of combine knowledge and concepts into laboratory training to

the whole system of organization (French, 1969). Organization development intervention (ODI) is explained as "a series of activities, actions, and events designed to help an organization improve its performance and effectiveness." The intervention can be viewed as the implementation of a well-designed activities with the purpose of change-making or a change process on an ongoing system of organizations. the inventions can be implemented through the target of intervention based on the situational need for change. It can be applied at four primary levels, including human process, techno-structural, human resources management and strategic intervention. Holman et.al (2007) has concluded 35 intervention methods covering five levels namely individual intervention, interpersonal intervention, group intervention, intergroup intervention and total system intervention. Among these 35 methods, mentoring, coaching, team building, goal setting, and appreciative inquiry, are applied in this action research.

2.2. Theoretical Framework

Karin (2014) explains the barriers, which can influence the expected outcomes on GVTs, which are language, culture, technology challenges and collaboration challenges. These findings provide a confirmation of building the foundation of this action research; it proposed that the cultures related issues have a significant impact to the communication outcomes of GVTs. It is commonly agreed by scholars that miscommunication brought by cultural diversity can result in conflicts, negative attitudes or misunderstandings (Dekker, 2008, p. 39; Hofstede, Hofstede, & Minkov, 2010; Shachaf, 2008, p. 133). Miranda et al. (2020) has built the framework to explain the relationship between collaborative learning and quality of collaboration, and the relationship between quality collaboration and intercultural competence. This framework support the existing relationship between coloration learning and intercultural competence.
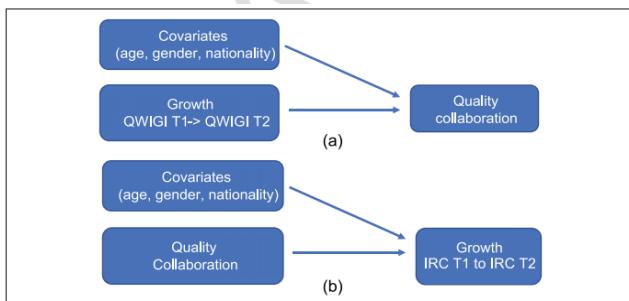

Figure 1: Quality collaboration improve the intercultural competence

There are numerous studies related to the

measurement of IC. Variables related to different theory actually can be grouped and concluded into classification. Shannon and Hartel (2020) proposed the dimensions of intercultural competence, and explain the competence from cognitive, affective and behavioral dimensions.

Figure 2: Classification of intercultural competence

Competency	Classification
Cognitive complexity	Cognitive
Goal orientation	Cognitive
Dissimilarity openness	Affective
Tolerance for ambiguity	Affective
Cultural empathy	Affective
Intercultural communication competence	Behavioural
Emotion management skills	Behavioural
Conflict management skills	Behavioural

Baanqud et al. (2020) works on the study of a model for cloud-supported collaborative learning, four aspects has dimensions remains, including cognitive engagement, knowledge sharing and reflective thinking.
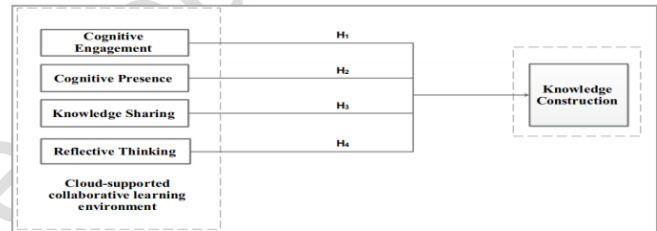

Figure 3: Collaborative learning model

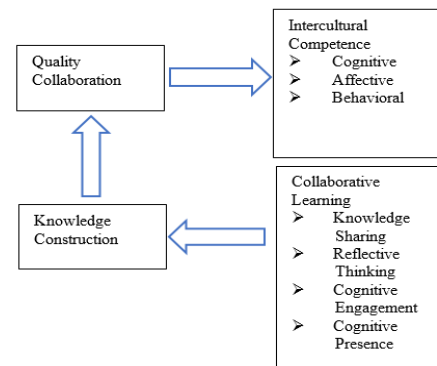To conclude the theory above, the theoretical framework can be demonstrated as follow.

Figure 4: Theoretical Framework
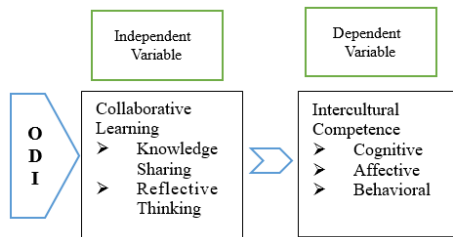
2.4. Conceptual Framework

Figure 5: Conceptual Framework

2.5. Research Hypothesis

H1: Knowledge sharing has a significant impact on cognitive competence.

H2: Reflective thinking has a significant impact on cognitive competence.

H3: Knowledge sharing has a significant impact on affective competence.

H4: Reflective thinking has a significant impact on affective competence.

H5: Knowledge sharing has a significant impact on behavioral competence.

H6: Reflective thinking has a significant impact on behavioral competence.

H7: There is a significant difference in knowledge sharing between Pre-ODI and Post ODI stages.

H8: There is a significant difference in reflective thinking between Pre-ODI and Post ODI stages.

H9: There is a significant difference in cognitive competence between Pre-ODI and Post ODI stages.

H10: There is a significant difference in affective competence between Pre-ODI and Post ODI stages.

H11: There is a significant difference in behavioral competence between Pre-ODI and Post ODI stages.
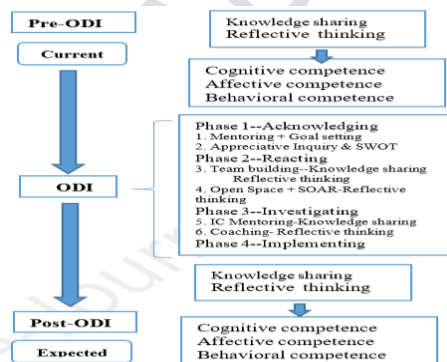
2.5. Action Research Framework

Figure 6: Action Research Framework

3. Research Methodology

3.1. Research Design

This action research focus on developing collaborative learning to enhance student intercultural competence of international virtual team by conduct OD interventions at Chinese private universities. There are three stages, namely pre-ODI, ODI and post-ODI, the mixed methods are applied through the whole process. Before the pre-ODI stages, some qualitative data were collected for preliminary diagnoses, by the instruments including observation, interviews and SWOT analysis. The data collected of preliminary diagnose helped to identify the current situation and needs for changes. The following table concluded the overall process of this action research covering three stages with focused purpose.

Table 1: Research Design

Stage	Research Instrument	Purpose	Target	Sampling Procedure	Data Analysis
Pre-ODI	Observation Interview	Preliminary Diagnosis	Participator of IVT n=9	Purposive	Content analysis
	SWOT & SOAR 7S MODEL		Student majored in IB	Purposive	Content analysis
	Questionnaire	Pilot test for reliability	Students n=30	Random	Reliability test
	Questionnaire	Examine the causal Relationship between variables	Students n=200	Purposive	Descriptive MLR
	Questionnaire	data compare with the post	Experimental Students n=45	Purposive	Descriptive Paired sample t-test
	Interview	Support questionnaire	Students from Experimental n=5	Random	Content analysis
	Observation	Support questionnaire	Experimental Students n=45	Purposive	Content analysis
ODI	Goal setting Mentoring Team building AI Open space Coaching	Changing Process	Experimental Students n=45	Purposive	Content Analysis
Post-ODI	Questionnaire	data compare with the pre-ODI	Experimental Students n=45	Purposive	Paired sample t-test
	Interview	Support questionnaire	Students from Experimental n=5	Random	Content analysis
	Observation	Support questionnaire	Experimental Students n=45	Purposive	Content analysis

3.2. Instrumentation-Questionnaire

3.2.1. Design of Questionnaire

Designing Questionnaire can be seen as the process of building measurement for the action research, which is highly crucial procedure in every research. The development of questionnaire of this action research inspired by few reference, and with some adaptations for IVT context.

The questionnaire start with basic information collection, including gender, English level, and the

frequency of attending IVT, which can contribute to findings analysis. This questionnaire utilizes 5-point Likert scale for measuring items (Likert, 1932), which are Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree. There are 5 sub-variables covering total 34 questions, with reflective thinking 7 items, knowledge sharing 8 items, 4 items for cognitive competence, 4 items for affective items and 6 for behavior competence. Three references contributing to this questionnaire, and detailed examples will be shown in the following table.

Table 2 Design of Questionnaire

Variable	Sub-Variables	No.	Example	Reference
Collaborative learning	Collaborative learning	4	The discussion in CL was relevant and productive.	Adapted from Baanqud et al. (2020).
	Knowledge sharing	8	My knowledge sharing in CL helpedother members of the team to solve prob lems.	
	Reflective thinking	7	I often reflect on my actions in CL to see Whether I could have improved on What I did.	
Intercultural Competence	Cognitive competence	4	I am conscious of the cultural knowledge I use when interacting with people with different cultural backgrounds.	Adapted from Alvino et al. (1995); Ferreira-Lopes et al. (2018).
	Affective competence	4	I am willing to interact with the people with different cultural backgrounds.	
	Behavioral competence	6	I adjusted my behavior, dress, etc., as appropriate, to avoid offending different cultures.	

Table 3: The Value of Cronbach's Alpha

Variables	No. of items	Cronbach's Alpha	Strength of association
Collaborative Learning	4	.798	Acceptable
Knowledge sharing	7	.883	Good
Reflective thinking	8	.865	Good
Cognitive competence	5	.734	Acceptable
Affective competence	5	.910	Excellent
Behavioral competence	6	.944	Excellent

3.2.1. Validity and reliability analysis

Content validity is considered as the quality measurement, the quality of content can guarantee the suitable items for questionnaire design, and support gathering needed information and assessing results from the respondents. In this research, the index of item-objective congruence (IOC), one type of content validly is used in this research. IOC collects judgmental opinions of experts to verify instruments (Rovinelli & Hambleton, 1977). Minimum of two experts are required for IOC. However, this research invited five experts to give the judgmental opinions about questionnaire that were developed according to referred research. The rating process of IOC is experts marks the items with the ranging the scale from -1 to +1,

with Congruent = + 1, Questionable = 0 and Incongruent = -1. The mean score from all experts shows results of IOC, only item with 0.67 or more can be kept. In this research, there are two items should be removed with the score of 0.6 and 0.4. Therefore, after the IOC process, knowledge sharing kept 8 items and 7 remained for reflective thinking, 34 questions in all.

The Cronbach's Alpha (CA) is used to test the reliability of this questionnaire instrument. Bardhoshi and Erford (2017) suggests that CA can be seen as the most appropriate method of reliability testing before issuing the questionnaire to target respondents. Acceptable value for CA test should have the value of 0.60 or more (Sekaran, 1992). For conducting CA test, Questionnaire need to firstly delivered to 30 respondents for the pilot test. The following table presents the testing results and the degree of association. All the items has passed the reliability test with 0.6 or above score, all the questions are considered highly associated with the variables.

3.2.2. The relationship between IV and DV

Before questionnaire delivered to experiential group at pre-ODI stage, the questionnaire is delivered to 200 respondents and examined by multiple linear regression to support the influential relationship between each variable, meanwhile test the first six hypotheses. The MLR is conducted three rounds, the results are shown as follows.

Table 4: Results of MLR

Variables	Standardized Coefficients (Beta)	t	Sig.	R	R Square
Reflective thinking	.586	9.984	.000	.618ᵃ	.381
Knowledge Sharing	.084	1.428	.155		
Dependent variable: Behavioral competence					
Reflective thinking	.265	4.388	.000	.586ᵃ	.343
Knowledge Sharing	.444	7.350	.000		
Dependent variable: Cognitive competence					
Reflective thinking	.540	9.005	.000	.596ᵃ	.355
Knowledge Sharing	.134	2.230	.027		
Dependent variable: Affective competence					

In conclusion, after the analyzed by MLR, results supported the five hypotheses, H5: "Knowledge sharing has a significant impact on behavioral competence." is rejected. The conceptual framework is examined and the action research framework can be finalized.

3.3. OD design process

The process of ODI covers thirteen weeks. The ODI plan include the time and place, people involved,

intervention purpose and tools, the specific procedure will be introduced in the following table.

Table 5: OD design

No.	Task	Time & Duration	Purpose	Intervention tool
1	Create a SMART goal and shared vision	Wk 1 2hrs	Set a SMART goal Create a vision for change; Communicate the shared vision Introduce the intervention activity plan	Mentoring Goal Setting
2	Raise self-awareness	Wk 2 2 hrs	Use analytic tools to diagnose the current situation. Create a readiness for change Improve the self-awareness ability	Appreciative Inquiry SWOT diagnostic analytic tool
3	Getting familiar with collaborative learning	Wk 3 2hrs	Experience collaborative learning Practice knowledge sharing and reflective thinking Complete the task "the barriers of international virtual teamwork".	Team building
4	Reflective thinking practice	Wk 4 2 hrs	Introduce reflective thinking Practice reflective thinking Complete the discussion "how to improve IC of International virtual teamwork"	Open space, SOAR analysis
5	Knowledge sharing practice	Wk 5-8 8 hrs	Learning basic culture theories by knowledge sharing Building and reinforce the cognitive and affective competences.	Coaching
6	Reflective thinking practice	Wk 9-11 6 hrs	Applying knowledge to analysis the real-world practice by reflective thinking. Building and reinforce the cognitive, affective and behavioral competences.	Coaching
7	Reflect the beginning at the end	Wk 12-13 4 hrs	Personal review and assessment Reinforce the cognitive, affective and behavioral competences.	Mentoring

4. Results and Discussion

4.1 Results of quantitative data analysis

From the results form paired sample t-test, it is obvious that there is a significant difference between Pre- and post-ODI stage of knowledge sharing, reflective thinking, cognitive competence, affective competence and behavioral competence. The following table conclude the data information from paired sample t-test.

Table 6: Overall comparison of quantitative data (n=45)

		Mean	Std. Deviation	Increasing	Sig.
Pair 1	Pre-KS	2.76	.309	63.4%	.000
	Post-KS	4.51	.357		
Pair 2	Pre-RT	2.82	.420	63.8%	.000
	Post-RT	4.62	.325		
Pair 3	Pre-CC	2.75	.480	66.5%	.000
	Post-CC	4.58	.337		
Pair 4	Pre-AC	2.43	.498	88%	.000
	Post-AC	4.57	.349		
Pair 5	Pre-BC	2.53	.512	82.6%	.000
	Post-BC	4.62	.372		

Table 7: results of paired ample t-test (n=45)

Variables	Ques.	Stage	Means	Sig
Collaborative Learning	1	Pre-ODI	2.87	.000
		Post-ODI	4.44	
	2	Pre-ODI	2.84	.000
		Post-ODI	4.49	
	3	Pre-ODI	2.82	.000
		Post-ODI	4.47	
	4	Pre-ODI	2.8	.000
		Post-ODI	4.53	
Knowledge Sharing	1	Pre-ODI	2.71	.000
		Post-ODI	4.49	
	2	Pre-ODI	2.78	.000
		Post-ODI	4.58	
	3	Pre-ODI	2.76	.000
		Post-ODI	4.44	
	4	Pre-ODI	2.67	.000
		Post-ODI	4.6	
	5	Pre-ODI	2.82	.000
		Post-ODI	4.44	
	6	Pre-ODI	2.8	.000
		Post-ODI	4.58	
	7	Pre-ODI	2.76	.000
		Post-ODI	4.44	
	8	Pre-ODI	2.84	.000
		Post-ODI	4.53	
Reflective Thinking	1	Pre-ODI	2.76	.000
		Post-ODI	4.49	
	2	Pre-ODI	3.04	.000
		Post-ODI	4.8	
	3	Pre-ODI	2.82	.000
		Post-ODI	4.47	
	4	Pre-ODI	2.73	.000
		Post-ODI	4.82	
	5	Pre-ODI	3	.000
		Post-ODI	4.47	
	6	Pre-ODI	2.69	.000
		Post-ODI	4.69	
	7	Pre-ODI	2.69	.000
		Post-ODI	4.58	
Cognitive Competence	1	Pre-ODI	2.84	.000
		Post-ODI	4.51	
	2	Pre-ODI	2.84	.000
		Post-ODI	4.67	

3	Pre-ODI	2.82	.000
	Post-ODI	4.56	
4	Pre-ODI	2.49	.000
	Post-ODI	4.6	
Affective Competence — 1	Pre-ODI	2.33	.000
	Post-ODI	4.58	
2	Pre-ODI	2.27	.000
	Post-ODI	4.58	
3	Pre-ODI	2.4	.000
	Post-ODI	4.56	
4	Pre-ODI	2.42	.000
	Post-ODI	4.56	
Behavioral Competence — 1	Pre-ODI	2.58	.000
	Post-ODI	4.58	
2	Pre-ODI	2.42	.000
	Post-ODI	4.58	
3	Pre-ODI	2.4	.000
	Post-ODI	4.6	
4	Pre-ODI	2.38	.000
	Post-ODI	4.58	
5	Pre-ODI	2.58	.000
	Post-ODI	4.64	
6	Pre-ODI	2.82	.000
	Post-ODI	4.73	

4.2. Results of qualitative data analysis

4.2.1. Collaborative Learning

During the interview at the pre-ODI stage, the target students are not familiar with "collaborative learning". They are used to the classroom lead by instructor, so they do not need to think and reflect actively, just follow the instructor. According to the traditional teaching method, instructor control the learning content. It is very common among Chinese University undergraduates, they rely on the instructor during the learning, and it has formed a learning habit.

Knowledge sharing also is unfamiliar learning strategy for the research target. They used to take the knowledge from the learning resources provided by instructor. Most of the students will not be willing to search knowledge by themselves, not even mention about the sharing knowledge actively.

Reflective thinking can also be seen as a weakness for the research target. The students do not have the recognition about the importance and function of reflective thinking. When students are asked to answer a question a submit a written assignment about reflective thinking, they feel difficult to answer this kind of open questions, which means they cannot actively reflect, they need specific questions to answer.

After the ODI stage, all the research targets gets understand the meaning of collaborative learning, and started to enjoy this process and feel the sense of achievements from the collaborative learning process. Most importantly, respondents accept the role changing during the

learning process, traditionally the learning process are led by instructor, however students feel the experience when they become the host of the learning process, instructor just control the procedure and observe, and give some opinions when conclusion. When students experience process the knowledge sharing, they can achieve the self-efficacy during the sharing process, it greatly encourage their learning autonomy, and meanwhile create the desire of actively search knowledge and sharing with others. After intervention, all the respondents understand the meaning of reflective thinking and the benefits of doing it with the guidance from instructor. In addition, it is commonly agreed that reflective thinking is an useful method of learning, for redo, rethink, reconsider, the learned knowledge and skills can be reinforced with absorbed.

4.2.2. Intercultural Competence

At the pre-ODI stage, most respondents believe that they understand the meaning of Intercultural Competence. Intercultural Competence is very simple term, and they believe the intercultural competence is the ability of "communication with foreigner". After they check the measure scale of intercultural competence, that they realize the difficulty of achieving intercultural competence, and their problems on IVT are also examined with reasons.

About the three dimension of intercultural competence, students are only aware of the behavioral level, just awareness not application. They admitted that they are lack of cultural knowledge, related cultural theory, and cross-culture communication practice. They were also asked to identified the barriers of IVT communication, few points were collected from respondents, cultural understanding, lack of non-verbal communication, lack of confident and care about "face" so no interaction, and no camera. Surprisingly, English language is not considered as a barrier, most students can accept language with correct meaning, in other words, no interaction is not caused by language issue, mostly caused by cultural misunderstanding, for instance, students feel secured and comfortable then refusing switch on the camera, but they did not realized this behavior is not cultural-friendly to the people with different cultural background. Offline communication in the real-world might weak the extent of cultural misunderstanding, non-verbal communication can support the explanation.

At the post-ODI stage, students have successfully build the awareness of cultural understanding; some cultural knowledge and related theory are absorbed through knowledge sharing and reflective thinking. Students started to reflect the appropriateness of their behavior when virtual cross-cultural encounters happen.

To sum up, the qualitative data analysis also support that the ODI has a positive impact on knowledge sharing, reflective thinking, cognitive competence, affective

competence and behavioral competence.

4.3. Hypothesis testing results

To conclude all the data from above, all the hypotheses conclude only H5 has been rejected, others are all supported by the results.

H1: Knowledge sharing has a significant impact on cognitive competence.

H2: Reflective thinking has a significant impact on cognitive competence.

H3: Knowledge sharing has a significant impact on affective competence.

H4: Reflective thinking has a significant impact on affective competence.

H5: Knowledge sharing has no significant impact on behavioral competence.

H6: Reflective thinking has a significant impact on behavioral competence.

H7: There is a significant difference in knowledge sharing between Pre-ODI and Post ODI stages.

H8: There is a significant difference in reflective thinking between Pre-ODI and Post ODI stages.

H9: There is a significant difference in cognitive competence between Pre-ODI and Post ODI stages.

H10: There is a significant difference in affective competence between Pre-ODI and Post ODI stages.

H11: There is a significant difference in behavioral competence between Pre-ODI and Post ODI stages.

5. Discussions and Conclusions

5.1. Discussions

This action research focuses on the interventions on collaborative learning for improvement of intercultural competence for business students of international virtual team. A 13-week- intervention plan was implemented on business students at Heilongjiang International University with the purpose of solving problems caused by increasing opportunities of international virtual programme. Before interventions, students with business major have limited preparation for intercultural competence, comparing the students in language related majors. The outbreak of pandemic pushed the development of international virtual team programme, it then asks for the urgent concentration on improving intercultural competence. The framework in this action research developed from Miranda et al.,(2020), which build the basic relationship between collaborative learning and intercultural competence. The research findings align with this empirical study. Knowledge sharing and reflective thinking are learning strategies of

collaborative learning chosen as sub-variables of collaborative learning, also where the interventions focus on. The intervention process were designed with careful considerations, because the previous state of students is low awareness of both collaborative learning and intercultural competence, the intervention started from raising awareness and goal setting, then move to the intervention stage on knowledge sharing and reflective thinking, and finally is the stage of reflection and reinforcement. The intervention process also support and follow the change model of organizations, from unfreeze to change and to refreeze. With the support from empirical studies, the OD interventions achieved the desired outcomes.

5.2. Conclusions

This action research with empirical evidence represents the changing process with OD intervention at a Chinese private university. The needs for change comes from the preliminary diagnosis on students' performance of IVT. The significance of conducting research is to investigate the proper interventions to improving the students' intercultural competence virtually. The well-designed research plan is delivered.

At the pre-ODI stage, the current situation was examined and investigated by mixed methods. Both quantitative and qualitative results show low level of students' collaborative learning and intercultural competence. After the OD intervention, results from paired sample t-test and content analysis both support that, there is a significant improvement between pre-and post ODI stage on knowledge sharing, reflective thinking, cognitive competence, affective competence and behavioral competence.

The research findings can be directive reference recommended as learning strategies for cultivating students' intercultural competence. This action research still need further reinforcement and discussion considering some limitation such as regional issue, and sampling procedure.

References

Abdelrahman, M., Masri, F., & Skoumpopoulou, D. (2019). *Knowledge Management Systems Characteristics That Support Knowledge Sharing and Decision-Making Processes in Organizations.* In Y. Albastaki, A. Al-Alawi, & S. Abdulrahman Al-Bassam (Ed.), Handbook of Research on Implementing Knowledge Management Strategy in the Public Sector

Baanqud, N.S., Al-Samarraie, H., Alzahrani, A.I. (2020) *Engagement in cloud-supported collaborative learning and student knowledge construction: a modeling study.* Int J Educ Technol High Educ 17, 56. https://doi.org/10.1186/s41239-

020-00232-z

Becerra-Fernandez, I., & Sabherwal, R. (2011). *The Role of Information and Communication Technologies in Knowledge Management: A Classification of Knowledge Management Systems.* In D. Schwartz, & D. Te'eni (Ed.), Encyclopedia of Knowledge Management, Second Edition (pp. 1410-1418).

Brewer, P. (2010). *Miscommunication in international virtual workplaces: A report on a multicase study.* IEEE Transactions on Professional Communication, 53(4), 329-345.

Bradford, D.L., & Burke, W.W. (2005). *Reinventing organization development: new approaches to change in organizations.*

Bardhoshi, G., Erford, B. T., Sherman, M. F., & Atalay, Z. (2017). *Brief Psychometric Analysis of the Self-Evaluation Scale–Parent Report (SES–P).* Counseling Outcome Research and Evaluation, 8(2), 63–76. https://doi.org/10.1080/21501378.2017.1336616

Chen C. (2016). *Research on intercultural communication competence measurement of Chinese University students.* Hunan Normal University

Chen, C. J., & Hung, S. W. (2010). *To give or to receive? Factors influencing members' knowledge sharing and community promotion in professional virtual communities.* Information & Management, 47(4), 226-236.

Chen, G. M., & Starosta, W. J. (1996). *Intercultural Communication Competence: A Synthesis.* Annals of the International Communication Association, 19(1), 353–383. https://doi.org/10.1080/23808985.1996.11678935

Corbin J, Morse J. M. (2003) The unstructured interactive interview: Issues of reciprocity and risks when dealing with sensitive topics. Qual Inq 2003;9:335-54.

de Hei, M., Tabacaru, C., Sjoer, E., Rippe, R., & Walenkamp, J. (2019). *Developing Intercultural Competence Through Collaborative Learning in International Higher Education.* Journal of Studies in International Education, 24(2), 190–211. https://doi.org/10.1177/1028315319826226

Deardorff, D. K. (2004) .*Identification and Assessment of Intercultural Competence as a Student Outcome of Internationalization.* Journal of Studies in International Education, Vol. 10 No. 3, Fall 2006 241-266.

Dekker, D. (2008). *Global virtual teams: Enhancing effectiveness.*Eindhoven University of Technology, The Netherlands.

Dekker, D., Rutte, C., & Van den Berg, P. (2008). *Cultural differences in the perception of critical interaction behaviors in global virtual teams.* International Journal of Intercultural Relations, 32(2008), 441-452.

Dodd, C. (1987). *The dynamics of intercultural communication.* Dubuque, IA:Wm. C. Brown Publishers.

Evans, C. M. (2017). *Interpersonal Communication Application to Leadership.* In V. Wang (Eds.), Encyclopedia of Strategic Leadership and Management. IGI Global

Erford, B. T., Bardhoshi, G., Ross, M., Gunther, C., & Duncan, K. (2017). *Meta-Analysis of Counseling Outcomes for Youth With Conduct Disorders.* Journal of Counseling & Development, 95(1), 35–44. https://doi.org/10.1002/jcad.12115

Ferrari, F. (2020). *Organizational and Socio-Relational Factors Undermining Knowledge Sharing in Family SMEs: An Empirical Investigation in the Italian Context*. In J. Palma-Ruiz, I. Barros-Contreras, & L. Gnan (Eds.), Handbook of Research on the Strategic Management of Family Businesses

Ferreira-Lopes, L., Elexpuru-Albizuri, I. & Bezanilla, M.J. (2021), *Developing business students' intercultural competence through intercultural virtual collaboration: a task sequence implementation*, Journal of International Education in Business, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/JIEB-06-2020-0055

Goettsch, Karin L. (2014) *Understanding intercultural communication on global virtual teams: exploring challenges of language, culture, technology, and collaboration.* Retrieved from the University of Minnesota Digital Conservancy.

GUDYKUNST, W. B. (1997). *Cultural Variability in Communication*. Communication Research, 24(4), 327-348. https://doi.org/10.1177/009365097024004001

Hill, C.W. (2001) *International Business: Competing in the Global Marketplace,* Burr Ridge, IL: Irwin McGraw-Hill.

Halpern, D. F. (1996). *Thought and knowledge: an introduction to critical thinking (3rd ed.).* Mahwah, NJ: L. Erlbaum Associates.

Hofstede, G., Hofstede, G., & Minkov, M. (2010). *Cultures and organizations, software of the mind (3rd Ed.).* New York: McGraw Hill.

Hambleton, I. (1977). *Existence of Free Involution on 5-Manifolds.* Indiana University Mathematics Journal, 26(4),777. https://doi.org/10.1512/iumj.1977.26.26060

Hu, J. (2013). *Cross-culture conflict management.* Course Teaching and Research. (5)

Iles, P. (1995). *Learning to work with difference.* Personnel Review, 24(6), 44-60.

Inkaew, Manachai (2016).*An Analysis of Intercultural Communicative Competence: Hotel Front Office Personnel in Bangkok.* Journal of Language Teaching and Learning in Thailand, 51 185-214.

Knapp, M. L., & Daly, J. A. (2011). *The SAGE Handbook of Interpersonal Communication (4th ed.)*. California: SAGE Publications.

Kelley, C. & Meyers, J., (1995). *The cross-cultural adaptability inventory*: Manual. Minneapolis: MN: NCS Pearson.

Law, W. K. (2009). *Cross-Cultural Challenges for Information Resources Management.* In M. Khosrow-Pour, D.B.A., Encyclopedia of Information Science and Technology, Second Edition, 840-846.

Lin, C.Y., Huang, C.K., & Ko, C.J. (2020). *The impact of perceived enjoyment on team efectiveness and individual learning in a blended learning business course: The mediating effect of knowledge sharing.* Australasian Journal of Educational Technology, 36, 126–141.

Likert, R. (1932). *A technique for measurement of attitudes.* Archives of Psychology, 140, 5-55

Lustig, M. W., & Koester, J. (2002). *Intercultural Competence: Interpersonal Communication Across Cultures (4th Edition)* (4th ed.). Allyn & Bacon.

Lloyd, S., & Härtel, C. (2010). *Intercultural competencies for culturally diverse work teams.* Journal of Managerial Psychology, 25(8), 845–875. https://doi.org/10.1108/02683941011089125

Murdoch, K. & Wilson, J. (2008). *Creating a learner-centred primary classroom: Learner-centred strategic teaching.* Paperback (1st ed.). Routledge.

Mäkäräinen-Suni, I., & Hong, J. (2011). *Ba and Communities of Practice in Research and Strategic Communities as a Way Forward.* In O. Hernáez, & E. Bueno Campos (Ed.), Handbook of Research on Communities of Practice for Organizational Management and Networking: Methodologies for Competitive Advantage

Magnier-Watanabe, R., Watanabe, Y., Aba, O., & Herrig, H. (2017). *Global virtual teams' education: experiential learning in the classroom.* On the Horizon, 25(4), 267–285. https://doi.org/10.1108/oth-02-2017-0007

Murphy-Lejeune, E. (2003). *An Experience of Interculturality: Student travellers abroad.* In G. Alred, M. Byram, & M. Fleming (Eds.), Intercultural experience and education (pp. 101-113). Great Britain: Cromwell Press Ltd.

Rosenberg, E., Kirmayer, L. J., Xenocostas, S., Dao, M. D., & Loignon, C. (2007). *GPs' strategies in intercultural clinical encounters.* Family Practice, 24(2),145–151. https://doi.org/10.1093/fampra/cmm004

Wang, Y, & Miao, L. (2020). *Ethnographic approaches to developing intercultural competence through intercultural interactions in the higher education context in China.* In E. Hagley & Y. Wang (Eds), Virtual exchange in the Asia-Pacific: research and practice (pp. 11-36).Indrani Dewi Anggraini

O'Dowd, R. (2018). *From telecollaboration to virtual exchange: state-of-the-art and the role of UNICollaboration in moving forward.* Journal of Virtual Exchange, 1, 1-23. Research-publishing.net; https://doi.org/10.14705/rpnet.2018.jve.1.

Perry, L. B., & Southwell, L. (2011). *Developing intercultural understanding and skills: models and approaches.* Intercultural Education, 22(6), 453–466.https://doi.org/10.1080/14675986.2011.644948

Ruben, B. D., & Kealey, D. J. (1979). *Behavioral assessment of communication competency and the prediction of cross-cultural adaptation.* International Journal of Intercultural Relations, 3(1), 15–47. https://doi.org/10.1016/0147-1767(79)90045-2

Smith, B. L. & MacGregor, J. T. (1992). *What Is Collaborative Learning. In Goodsell, A. S. (Ed.), Collaborative Learning: a sourcebook for higher education*. University Park, PA: National Center on Postsecondary Teaching, Learning, and Assessment. Durham Thesis, Durham University

Sherer, Pamela & Shea, Timothy. (2011). *Using Online Video to Support Student Learning and Engagement.* College Teaching. 59. 56-59.

Shachaf, P. (2008). *Cultural diversity and information and communication technology impacts on global virtual teams: An exploratory study.* Information & Management, 45(2), 131–142. https://doi.org/10.1016/j.im.2007.12.003

Trautrims, A., Defee, C., & Farris, T. (2016). *Preparing business students for workplace reality – using global virtual teams in logistics and SCM education.* The International Journal of Logistics Management, 27(3), 886–907. https://doi.org/10.1108/ijlm-01-2015-0003

Ueno, S., & Sekaran, U. (1992). *The Influence of Culture on Budget Control Practices in the USA and Japan: An Empirical Study.* Journal of International Business Studies, 23(4), 659–674. https://doi.org/10.1057/palgrave.jibs.8490282

Vassiliou, A. (2013), *Why European universities must become more international,* Press conference on European higher education in the world, European Commission, Brussels

Wang Y. (2015). *Research on cultivate intercultural competence of universities' internalization business students.* International Business.

Yang Y, Liu B, & Song Y. (2013). *Relevant research of Intercultural competence and employability.* Journal of Teachers in Education, 11(007), 153-156.

Zhu, X.M. (2012). *Research of collaborative learning in digital classroom.* Doctoral dissertation, Huazhong Noemal University