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THE ROLE OF COMMUNICATION VARIABLES IN L2 COMMUNICATION INTENTION IN PROJECT-BASED LEARNING (PBL) INSTRUCTIONAL CONTEXTS

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ABSTRACT

The role of communication variables such as communication apprehension (CA), self-perceived communication competence (SPCC), and intercultural willingness to communicate (IWTC) in improving L2 WTC has rarely been compared or even considered in detail in project-based learning (PBL) classroom contexts. Given this research gap, a mixed-methods study was designed to examine the interconnection of the above-mentioned communication variables in PBL contexts. A questionnaire was administered to a total of 82 senior-year students from four sections of a PBL course at a university in northern Taiwan at the beginning and the end of the 18-week semester. The findings showed that SPCC and IWTC had significant explanatory power for L2 WTC, with the former exerting a greater impact on L2 WTC. Furthermore, with the exception of CA, the results for all the communication variables indicated significant positive change towards the end of the course. To gain more insight into the cognitive, affective, and contextual factors that may influence L2 WTC in PBL contexts, qualitative data derived from reflection reports revealed that situational WTC in PBL L2 classrooms was regulated and mediated by the interplay of multiple factors: group member support, learner engagement, mastery experience and practice, intrinsic motivation, and positive feedback and interaction.

Key Words: willingness to communicate (WTC), intercultural willingness to communicate (IWTC), self-perceived communication competence (SPCC), communication apprehension (CA), Project-based learning (PBL)

INTRODUCTION AND LITERATURE REVIEW

Over the past two decades, willingness to communicate (WTC)—the extent to which a person wishes to communicate with others given the opportunity to do so—has attracted increasing research attention from applied linguists. In particular, WTC has become a focus in the field of second language acquisition (SLA), with many researchers proposing interaction as essential to developing learners' communication competence (MacIntyre et al., 1998). Further, most mainstream paradigms in second language acquisition, whether from psycholinguistic or sociocultural perspectives, point to the salient role of language learners' attempts to negotiate meaning in the development of language proficiency (e.g., Lantolf & Thorne, 2006; Long, 1985; Mackey, 1999, 2007; Swain, 1985). More broadly, one can hardly argue against the idea that working to develop a new generation of people who are ready and confident to initiate interactions in educational or social contexts should be a principal objective of educational programs (MacIntyre et al., 1998). This broad context may explain why researchers and practitioners alike have focused on determining the extent to which underlying variables, whether cognitive, affective, communicative, or behavioral, interact with each other to facilitate or impede learners' readiness to initiate and engage in conversation with interlocutors across diverse contexts (Cao, 2011; Cao & Philp, 2006; Kang, 2005; MacIntyre et al., 1998). Importantly, research findings in this vein have provided evidence suggesting that a high level of WTC is associated with readiness to interact with intercultural communities (Yashima, 2002), whereas a higher level of self-perceived communication competence (SPCC) is associated with increased practice in the use of L2 (Hashimoto, 2002) and reduced L2 anxiety (MacIntyre & Charos, 1996).

Inspired by the heuristic pyramid model of WTC (MacIntyre et al., 1998) in which a wide array of social, psychological, personality and affective factors are postulated to exert influences on the ultimate communication behavior and L2 use, a large body of studies have acknowledged the importance of the intricate relations among variables that may contribute to communication intention, with the majority of the studies on examining the antecedents and circumstances of WTC and the interrelation among the communication factors (Clément & Baker, 2001; Khajavy et al., 2016; MacIntyre & Charos, 1996; Peng & Woodrow, 2010). Feeling that the studies that employed questionnaire surveys may fail to capture the underlying dynamics and the interference of multiple variables

operating at both micro- and macro levels, leading to the ultimate communication behavior, many researchers opt for an ecological approach to researching WTC by dominantly adopting a qualitative research method such as interviews, classroom observation, simulated recall, and reflective journals (Cameron, 2013; Cao, 2011, 2014; Kang, 2005; Peng, 2012, 2016; Yue, 2014; Zarrinabadi, 2014).

More recently, more researchers have been examining WTC drawing on the framework of Larsen-Freeman and Cameron's (2008) complex dynamic systems theory (CDST). The CDST approach focuses on the moment-to-moment fluctuations that are at the crux of the communication process; as such, it allows for a closer look at the situated interplay of key components in the pyramid model in action (MacIntyre, 2020; Mystkowska-Wiertelak & Pawlak, 2014; Syed et al., 2021). This approach examines the nuance of communication intention on multiple timeframes (i.e., seconds, minutes, hours, days, weeks, etc.) concurrently. Learners' state motivation and WTC is constantly influenced by a web of different interconnected and interacting factors. The fact that an individual may not be ready to initiate a conversation may be contingent on the anxiety state before he or she enters the classroom. However, it is likely that 10 minutes into the class, when the right topic is properly introduced and set up by the teacher, the same learner may be primed to enter into discourse.

It is important to point out that both the pyramid model and a more non-linear dynamic approach to researching WTC are useful for an understanding of the nature of what may promote or impede the desire to communicate. The difference between these two perspectives lies in that while the former is more appropriate if we are interested in the correlates among the social psychological components for a longer-term timeframe, the latter is more prone to capturing the underlying dynamic process of communication that often takes place on non-linear timescales (MacIntyre & Wang, 2021).

Another angle through which WTC has also been researched relates to how different language instructions may facilitate learners in initiating interaction inside and outside the classroom. For instance, WTC can be nurtured by implementing different instructions such as drama-based approaches (Lee et al., 2020), digital game-based learning (Reinders & Wattana, 2014), study abroad immersion experiences (Leis, 2015), and project-based learning (Farouck, 2016).

Project-based language learning (PBL) has been lauded as one of the potentially effective approaches of promoting meaningful learning (Stoller, 2006), nurturing learner motivation as well as fostering willingness to communicate (e.g., Farouck, 2016; Krajcik & Blumenfeld, 2006) in both education and second-language (L2)

contexts. Specifically, PBL has also been recognized as an effective instructional approach that simultaneously takes into account both language acquisition and content learning such that it has been linked to improved language skills, enhanced content learning, sustained motivation and engagement, and the development of a positive self-concept (Stoller & Myers, 2019).

In the PBL classroom, students are responsible for planning, executing, and reflecting on their own learning processes and outcomes by engaging in authentic tasks relevant to real-world issues (Ellis, 2003; Skehan, 1998). According to Willis (1996), PBL is well suited to task-based language which requires learners to make use of the target language for a communicative purpose in order to achieve a specific learning outcome. Another essential aspect of PBL is scaffolding (i.e., support from teachers, peers, and learning materials) so that learners have sufficient and appropriate resources to cope with assigned projects. It should be noted that ideally scaffolding should gradually be replaced with more ownership on the part of the learners. That is, over time, the learner should take greater responsibility for a wide array of assigned tasks from asking and responding to questions to assigning group roles to researching relevant sources to presenting the final product (Krajcik & Shin, 2014). Researchers have found that PBL can increase learners' motivation (Blumenfeld et al.,1991; Shin, 2018), positively influence learners' attitudes towards L2 learning (Kim & Choi, 2006), improve self-efficacy (Park & Hiver, 2017; Shin, 2018) and generate an ideal L2 self (Park & Hiver, 2017).

As described, PBL is thought to have potential for promoting learners' WTC in the learning process as the overarching principle is that of guiding students in negotiating and constructing meaning with peers in an immediate socio-cultural community organized around projects (Bell, 2010; Legutke & Thomas, 2013). However, the literature includes just a handful of studies in which PBL's role and effectiveness in shaping learners' WTC are examined (Cultrone & Beh, 2018; Farouck, 2016; Fukuta, 2017; Marzban & Mahmoudvand, 2013). For example, in investigating the influence of project-based language learning on students' WTC in EFL programs, Farouck (2016) found a decrease in communication anxiety, an increased level of confidence in their speaking ability, and an increase in WTC. Marzban and Mahmoudvand (2013) investigated the effect of a task-based approach on 61 pre-intermediate English learners' L2 WTC, communication apprehension, and self-perceived competence. In addition to covering the textbook content, the experimental group was required to perform extra problem-solving tasks. Based on a comparison between the L2 WTC, SPCC and CA of the sample and

that of a control group, the researchers found that the L2 WTC of the experimental group was significantly higher and that the learners' WTC was positively related to their SPCC but negatively related to their CA. In an investigation of the impact of task-based language teaching on 192 students' WTC in the context of a Japanese EFL university, Cultrone and Beh (2018) found that the students' overall WTC scores across different types of tasks (i.e., group discussion and public speaking) had significantly increased by the end of the course, whereas the WTC scores of the control group who received non-task-based instruction did not show any significant change. Moreover, Fukuta (2017) used a mixed-methods approach to trace changes in unwillingness to speak English on the part of 33 Japanese EFL learners engaged in task-based instruction once a week over a period of two semesters. The results indicate that task-based implementation may have been effective in reducing the learners' unwillingness to communicate, and once the learners had achieved a certain level of L2 confidence coupled with a low level of anxiety, their tendency to avoid communicating in the L2 may have been mitigated as a consequence.

To conclude, among many individual differences, CA and SPCC have been shown to contribute to L2 WTC, and international posture and intercultural willingness to communicate (IWTC) have also been found to correlate with L2 WTC (Kassing, 1997; Yashima, 2009). However, there is very little research in which the effects of these highly important communication variables on L2 WTC are compared in PBL classroom contexts. PBL has the potential to promote communication, negotiation, and collaboration among learners because they were required to brainstorm ideas and at the same time be effective listeners in their group project. Throughout the decision-making process, group members need to work together autonomously to engage in a learning activity where they investigate the topics, design the questions, and present the end products (Simpson, 2011; Thomas, 2000). As can be implied, unlike traditional teacher-centered teaching where learners are given predetermined scripts and are told what they need to know and then rote-memorize the content; within the PBL framework, a task is learner-centered in that students need to proactively ask challenging questions, debate contested ideas, and come up with feasible plans. Therefore, it is meaningful to explore the extent to which students who receive PBL will be more willing to engage in communication to accomplish a collaborative project.

Given the neglect of this subject in the literature, the purpose of the present mixed-methods inquiry is to advance the WTC literature by exploring how PBL instruction might strengthen learners'

communication intention and facilitate their language use in the EFL classroom. Specifically, variables such as CA, SPCC, and IWTC in L2 contexts are examined to observe the interplay between these communication factors. To complement the quantitative data, a thick description of the contributing factors to WTC is obtained through the use of reflection reports composed by the participants. Based on the stated research purpose, the specific research questions addressed are as follows:

1. In PBL settings, what is the relationship between L2 WTC and the focal communication variables (CA, SPCC, and IWTC)?
2. What effect does PBL have on L2 WTC and the focal communication variables (CA, SPCC, and IWTC)?
3. In PBL settings, what factors contribute to L2 WTC?

METHODOLOGY

Participants

The study sample consisted of 82 English major students in their senior year taking a special topic reports course at a university in northern Taiwan. It is important to note that the institute strongly promotes internationalization at home (IaH) and English as a medium of instruction (EMI) and that all the participants had received training in basic oral communication and public speaking in the past. In order to graduate with a degree in English from this university, students are required to demonstrate English-language proficiency equivalent to B2 level in the Common European Framework of Reference (CEFR). It is, therefore, likely that most if not all the study participants had a relatively strong command of the language. The participants responded to the questionnaire both before and after the PBL activity, which comprised four presentations given by each group of 3–5 members throughout the semester.

Course Description

The special topic reports course focuses on engaging students in special topics through discussions in relation to possible real-life

scenarios. The syllabus was designed with the goal of providing students with opportunities to enrich their knowledge. Each group of 3–5 students was assigned to do four presentations in the semester, with each presentation on an assigned topic and taking up approximately 30–40 minutes. For each presentation, the presenting group read many articles they searched online on the assigned topic, analyzed the information obtained, and presented their findings. A principal pedagogical goal of the course is that the students should demonstrate gains in their language knowledge and abilities as well as their critical-thinking skills and, as a result, become more confident when interacting in the English language.

Four sections of the course taught by four instructors, who were also the researchers, each with 20–30 students, were offered at the time the data were collected and all the students taking the course participated in the research. In each section, the students worked in self-selected groups of 3–5 based on shared interests and familiarity with each other. An important underlying principle of project-based language learning lies in allowing learners some freedom in the planning process (Bygate, 1999; Bygate et al., 2001). It is for this reason that the students were allowed to decide whom to collaborate with in the group structure.

Each group was required to give presentations on assigned topics throughout the semester. The projects were typically arranged such that group members were required to work together for three weeks over the course of the semester to prepare for subsequent presentation to the entire class. The topics covered fields ranging from literature and education to business, tourism, and global issues. The major articles the participants were to read were collectively selected by instructors teaching the course. Most of the reading materials assigned were newspaper articles from prestigious global news media outlets including *The Economist*, *The New York Times*, *Time*, and *Forbes*, as well as reports from CNN and the BBC. Some of the topics related to global events in mainstream media were "*The true story behind England's tea obsession*," "*Meet Hua Mulan, The legendary warrior behind the Disney classic*," and "*2020 is not 1968: To understand today's protests, you must look further back*." Based on the assigned topic together with the assigned article, the presenters then searched for more relevant information and presented their findings. Before and throughout the presentation, the instructors gave students constructive feedback regarding the content of the presentation including the content, organization schemes, critical thinking skills, PPT layout, team work as well as the other references. Initially, students needed more guidance as to how to find the relevant materials online, how to

transition smoothly, how to make a coherent argument, and how to ask valid questions. Gradually, with practice, students seemed to pick up the skills necessary to complete the tasks with the help of both the instructors' scaffolding and the feedback from their peers.

One of the fundamental tenets of PBL pedagogy is that students and teachers are invited to engage in cooperative activities to interrogate the issues in question and to find solutions to social problems (Blumenfeld et al., 1991). For example, when discussing the event concerning the tragic death of George Floyd, students were guided to critically examine the ethical, social, and cultural divides among African Americans throughout American history. They were also required to come up with practical and viable plans of action to tackle the challenges of racial inequality and discrimination not only in America but in Taiwan.

Students were required to proactively and independently search for relevant sources online and integrate prior knowledge, personal experiences, discussion feedback and digital texts into their projects. Importantly, in order to encourage PBL learners to conduct in-depth content analysis and make inferences for a given topic, participating students were required to design project-based driving questions to engage their audience in the Q&A session after the presentation. For instance, when introducing the topic, "*Understanding influencer marketing and why it is so effective,"* the assigned group invited the class to name an influencer that they know, assess how this influencer broke into the influencer market, and investigate why the company chose this person to endorse their product. Finally, they were asked scenario-based problems wherein if they were an influencer, how they would develop the content to attract potential customers or readers.

Finally, central to the principles embedded in PBL teaching has to do with allowing learners to consider and apply different and competing perspectives as well as examine alternative strategies. When talking about the topic "*Record-breaking temperatures around the world are 'almost entirely' due to climate change*," some sample discussion questions are *If you were government, what strategies would you implement? Why? How could we let more people focus on the importance of climate change? What could you do to decease carbon dioxide emissions? Have you ever heard of the campaign"救救北極熊"? What is the basic concept of that?* As can be seen, students were put to the test where they needed to exercise their problem-solving and critical thinking skills in applying strategies to solve problems related to global warming.

Instruments

A questionnaire with a 6-point Likert-type scale was used to collect data from the participants at the beginning of the course and towards the end of the course. "1" indicates strongly disagree/unwilling/incompetent, whereas "6" strongly agree/willing/competent. To ensure internal validity with regard to instrumentation, the same questionnaire was used on both occasions. There are two sections in the questionnaire. Section one includes a few items to gather basic demographic information (e.g., name, gender, year of learning English, etc.). Section two consists of five scales with a total of thirty-one items. The five scales pertained to anxiety in the classroom (AC), anxiety beyond the classroom (ABC), willingness to communicate (L2 WTC), intercultural willingness to communicate (IWTC), and self-perceived communication competence (L2 SPCC), and there were no reversed items in the five scales. Table 1 outlines the detailed information regarding the scales adopted.

Table 1

The Scales Used in the Questionnaires

Scale	Number of items	Source of scale	Example
AC	5	Ryan (2009)	I am afraid my classmates might laugh at me when I speak English.
ABC	4	Clément and Baker (2001)	When I make a phone call, I get mixed up if I have to speak English.
WTC	8	Yashima (2009).	When I have a group discussion in an English class.
IWTC	6	Kassing (1997)	When talking with someone from a culture I know very little about.
SPCC	8	Yashima (2009)	When I have a chance to talk in front of the class in an English class.

Willingness to communicate (L2 WTC)

Willingness to communicate (L2 WTC) was measured by adopting Yashima (2009) which contains eight items targeting an individual's likelihood of initiating conversation when free to do so on different occasions. A sample item is "How much would you choose to communicate in English when given a chance to make a presentation in front of a large group."

Intercultural willingness to communicate (IWTC)

IWTC, which is conceptualized as the "predisposition to initiate intercultural communication encounters" (Kassing, 1997, p. 400), was measured in this study. Kassing (1997) found that WTC and IWTC are conceptually different by factor analysis and pointed out that a person with high WTC may not have a comparable level of IWTC. Six items based on Kassing's scale items ranging from 1 (strongly unwilling) to 6 (strongly willing) were included in the questionnaire. A sample item is "How much would you choose to communicate when talking with someone from a culture one knows very little about."

L2 communication apprehension (L2 CA)

To assess the participants' communication anxiety (L2 CA) both within and outside the language classroom, modified versions of the scales in Ryan (2009) and Clément and Baker (2001) were employed, respectively. The participants were required to indicate the extent to which they agreed with statements about communicating in English in various situations. A sample item is "I am afraid my classmates will laugh at me when I speak English."

L2 self-perceived communication competence (L2 SPCC)

Students' self-perceived communication competence was measured based on the scale developed by Yashima (2009). The participants were required to indicate the extent to which they agreed with statements/items about their competence in communicating in

English on various occasions. A sample item is "How competent are you when you have a chance to talk in front of the class in an English class."

In order to gain more in-depth insights pertaining to how and why PBL may influence speaking confidence, anxiety, overall motivation, and communication intention, the participants were asked to provide a written reflection report. Toward the end of the course, the participants submitted their reports to address the following key questions: (1) How have the PBL course activities influenced your confidence, anxiety, overall motivation, and communication intention? (2) What difficulties have you encountered in planning and executing the projects? (3) What presentation skills and strategies have you developed (e.g., English-language proficiency, creativity, critical-thinking ability, and presentation skills)?

Data Collection

The four teachers who taught the special topic reports course invited their students to participate in the project at the beginning of and the end of the semester in the Fall 2020 academic year. Students were required to fill in the questionnaires and the reflection paper. All the questionnaires were filled in during class time and it took the students approximately 15 minutes on average to complete the questionnaire. The instructors emphasized that students' responses would not influence their grades. Also, the data collected was for research purposes, and confidentiality was ensured.

Data Analysis

To examine the relationships between the numerous affective and communication factors (i.e., SPCC, WTC, IWTC, and CA), as suggested by the participants' responses, statistical procedures such as correlations and multiple regression were employed. In addition, a paired-comparisons t-test was used to capture and determine the extent and nature of any changes based on differences of a set of pre-test measures and the results of a set of post-test measures.

In addition, a content analysis (Klaus, 2004) was performed to explore the participants' reflection reports. Identified themes were coded and comparisons made between the participants until saturation was reached, i.e., the point at which "no new information or themes are observed in the data" (Guest et al., 2006, p. 59).

RESULT

As stated, the scales were developed based on those used in previous studies, and a reliability analysis was performed with the goal of determining the degree to which items on a scale were closely related as a unified group. Both Cronbach values and composite reliability (CR) were provided. In addition, to further establish convergent validity, the estimation of average variance extracted (AVE) was conducted. Table 2 shows the Cronbach's alpha, CR and AVE of each scale. The results show generally acceptable reliability coefficients, with a Cronbach's alpha of .7 and a CR coefficient larger than .7, which is considered to be good (Hair et al., 2010; Nunnally, 1978). With respect to AVE analysis, an AVE larger than .5 is considered satisfactory. Although AVEs for AC and L2 WTC are below .5, according to Fornell and Larcker (1981), an AVE below .5 is still acceptable if the CR is above .7.

Table 2

Estimation of Reliability, AVE, and CR

Scale	*Cronbach*	*CR*	*AVE*
AC	.79	.796	.441
ABC	.88	.882	.653
L2 WTC	.87	.885	.492
IWTC	.95	.953	.774
SPCC	.91	.913	.571

Note. L2 WTC = perceived willingness to communicate in L2; AC = perceived anxiety in the classroom; ABC = perceived anxiety beyond the classroom; IWTC = perceived intercultural willingness to communicate; SPCC = self-perceived communication competence.

After taking the PBL course, the participants responded to the questionnaire. The results of the descriptive analysis and the correlations between the communication variables are presented in Table 3. The results indicate that the participants had a modest level of SPCC (M = 4.21, SD = 0.82). Interestingly, they reported a higher

IWTC (M = 4.47, SD = 1.03) than L2 WTC (M = 3.97, SD = 0.90). In contrast, they reported relatively low AC (M = 2.46, SD = 0.81) and ABC M = 2.39, SD = 0.91).

Table 3

Descriptive Statistics and Correlation Coefficients

Variable	*M*	*SD*	Inter-correlations			
			1	2	3	4
1. L2 WTC	3.97	.90				
2. AC	2.46	.81	-.20* .03			
3. ABC	2.39	.91	-.18* .05	.65** .00		
4. IWTC	4.47	1.03	.61*** .00	-.12 .13	-.16 .07	
5. SPCC	4.21	.82	.71*** .00	-.23* .02	-.24* .02	.62*** .00

Note. N = 82. L2 WTC = perceived willingness to communicate in L2; AC = perceived anxiety in the classroom; ABC = perceived anxiety beyond the classroom; IWTC = perceived intercultural willingness to communicate; SPCC = self-perceived communication competence

*p < .05. **p < .01. ***p < .001.

To answer research question 1, correlations between the five communication variables were captured (Table 3). A statistically significant correlation was found between the independent variables L2 WTC and SPCC (r = 0.71, p < .001), and a similarly strong correlation was detected between IWTC and SPCC (r = 0.62, p < .001). In addition, there was a significant and negative relationship between L2 WTC and two types of anxiety, AC (r = -0.20, p < .05) and ABC (r = -0.18, p < .05). However, these correlations are considered weak (Cohen, 1988). In contrast, the correlations between two types of anxiety, AC and IWTC (r = -0.12, p > .05) and ABC and IWTC (r = -0.16, p >.05) were non-significant, indicating that these two forms of anxiety were not related to IWTC.

Further analysis using multiple regression shows that taken

together, all the variables accounted for 55% of the variance in WTC, F (4, 77) = 23.94, $p < .000$, with an R^2 of .531.

Table 4

Beta Weights and Uniqueness Indices Predicting L2 WTC

	Beta weights		Uniqueness indices	
Predictor	Beta	*T*	Uniqueness index	*F*
AC	-.08	-.72	.00	0
ABC	.04	.38	.00	0
IWTC	.24	2.78**	.04	6.84*
SPCC	.60	5.41***	.17	29.09***

Note. N = 82. WTC = L2 perceived willingness to communicate in L2; AC = perceived anxiety in the classroom; ABC = perceived anxiety beyond the classroom; IWTC = perceived intercultural willingness to communicate; SPCC = perceived communication competence. Beta weights are the standardized multiple regression coefficients obtained when WTC was regressed on all four predictors. Uniqueness indices indicate the percentage of variance in the WTC scores accounted for by a given predictor variable beyond the variance accounted for by the other three predictors. The *t*-tests were used to determine the significance of the beta weights df = 77, and *F*-tests to determine the significance of the uniqueness indices; df = 1. 77.

*$p < .05$. **$p < .01$. ***$p < .001$.

The results for the β weight were obtained through a multiple regression analysis. A comparison between all the statistics shows SPCC to be the strongest predictor of L2 WTC across multiple indices (Table 4). Specifically, the largest beta weight ($\beta = .60$, $p < .001$) and a significant uniqueness index (.17) accrued to SPCC, suggesting that it made the largest contribution to the prediction of L2 WTC. In

addition, with a significant β weight ($\beta = 24$, $p < .01$) and a significant uniqueness index (.04), IWTC was also found to be important in predicting WTC. However, neither ABC nor AC was found to have an effect of any consequence on L2 WTC.

To answer research question 2, a paired sample *t*-test was performed to compare the results based on the data for the communication variables from the pre-treatment questionnaire with those from the post-treatment questionnaire. The results show that all the communication variables changed significantly from the beginning of the course as compared to near the end of the course, which suggests that the participants' intention to communicate in English both inside and outside the classroom slightly increased over the course of the PBL implementation (Table 5). A more detailed investigation brings to light a significant difference in L2 WTC between the pre-treatment questionnaire ($M = 3.77$, $SD = 0.90$) and the post-treatment questionnaire ($M = 3.97$, $SD = 0.90$), $t\,(51) = 2.35$, $p < .05$. Similarly, there was a significant yet moderate difference in SPCC between the pre-treatment survey ($M = 3.97$, $SD = 0.70$) and the post-treatment survey ($M = 4.21$, $SD = 0.82$), $t\,(51) = 3.03$, $p < .01$. Surprisingly, AC increased significantly in the post-treatment survey ($M = 2.95$, $SD = .95$), $t\,(51) = 6.01$) compared to the pre-treatment survey $M = 2.46$, $SD = 0.81$, $p < .001$).

Table 5

Results of a Paired Sample t-test Using a Pre-test and Post-test Procedure

	Mean	St.D.	*T*	*P*
PAC	2.95	.95	6.01***	.000
AC	2.46	.81		
PABC	2.39	.90	.87	.39
ABC	2.47	1.04		
PWTC	3.97	.90	2.352*	.02
WTC	3.77	.90		
PIWTC	4.47	1.03	.72	.48
IWTC	4.39	1.05		
PSPCC	4.21	.82	3.03**	.003
SPCC	3.97	.70		

Note. WTC = perceived willingness to communicate; PWTC = post-test perceived willingness to communicate; AC = perceived anxiety in the classroom; PAC = post-test perceived anxiety in the classroom; ABC = perceived anxiety beyond the classroom; PABC = post-test perceived anxiety beyond the classroom; IWTC = perceived intercultural willingness to communicate; PIWTC = post –test perceived intercultural willingness to communicate; SPCC = self-perceived communication competence; PSPCC = post-test perceived communication competence.
*$p < .05$. **$p < .01$. ***$p < .001$.

To determine how PBL may have played a role in the participants' development of an affirmative self-concept and communication intention, a further investigation was made to explore the factors that influence the way students design interactional questions, collaborate within groups, give and seek opinions, experiment with the newly gained linguistic and content-related knowledge, and ultimately evaluate performance and give feedback to other groups. To answer research question 3, the participants' written reflection reports were selected for close scrutiny. That is, they were subjected to content analysis (Klaus, 2004) to identify salient themes in relation to key communication factors such as speaking confidence and anxiety in the PBL context. The themes that emerged were coded in order to systematically pinpoint the factors that may influence learners' communication intention and behavior through the mediation of these key communication variables.

Group Member Support

The participants cited intellectual and emotional support provided by their team members as the main factors that helped them build confidence as a basis for communicating and, in particular, presenting more effectively. The following are representative statements that demonstrate this point:

> Before taking this course, I wasn't confident whenever I need to speak in public. Throughout all four presentations, I become more confident because of my supportive teammates. I enjoy working

> with them in an efficient way and enjoy presenting what we have come up with so far. We also ensure we are familiar with each other's presentation content and become more confident as a result.

> I admire my teammate's ability. Each discussion will indirectly inspire me in terms of ideas, creativity and delivery skills. We tolerate and respect each other and offer appropriate feedback.

In Dörnyei's (2001) view, the dynamics among group members are fundamentally important in accounting for learners' motivation to engage in the task at hand. As evidenced by their quotes, the participants credited their increased confidence and willingness to engage in a task to the functional coordination and mutual support among group members. Interestingly, it was found that the participants initiated communication to help their group members who were struggling to answer questions from the audience. By helping their team members, they worked together towards the group goals and were also able to complete the task successfully.

The participants pointed out that when a speaker elicited responses or invited discussion, they tended to react by contributing to the dialogue:

> When the speakers feel helpless . . . when no one is willing to respond, I usually will raise my hand voluntarily . . .

> I will try to answer the questions for fear that the speakers will feel awkward if no one answers.

The face-saving strategies used by learners to support each other may be attributable to their desire to protect each other's image in public, which is certainly influenced by Confucianism. The participants were greatly concerned with "lian," that is, the need to reduce embarrassment or prevent loss of respect in social situations (Wen & Clément, 2003). The audience's act of giving feedback to support the presenter attests to an inclination to uphold a cultural norm and achieve harmony.

Mastery Experience and Practice

According to Bandura (1997), one of the most salient sources of efficacy information derives from the learner experiencing a positive outcome and a sense of achievement. Having successfully negotiated a series of tasks that require students to engage critically and cognitively, learners are likely to have a high sense of self-efficacy, which tends to lead to greater self-confidence. The analysis of the results suggests that sufficient practice coupled with mastery experience from successfully completing the assigned tasks and projects were a potentially potent factor in reducing the participants' anxiety and in increasing their willingness to engage in similar tasks.

> Nervousness can lead to forgetting what to say on the stage when I first start presenting. Relying on the scripts has become a big obstacle for me. After a few practices, I am able to express the content without memorizing all the scripts.

> I cared about my pronunciation and the words I chose to use, that's why I was a little bit nervous during the speech . . . But throughout those practices, I felt more comfortable using English to make a speech.

As shown, some of the participants reported experiencing anxiety when giving their first presentation either because they were anxious about whether they had memorized the content and/or because they were concerned that their pronunciation might not be accurate or intelligible. Through repeated practice and an iterative trial-and-error approach, however, the participants refined their approach to presenting their work. For instance, one participant decided to change her delivery style such that instead of trying to memorize her content word for word and then repeat it verbatim, she decided to focus on becoming familiar with the content rather than relying on rote learning. Overall, as they gained experience in preparing for and giving presentations, the participants gradually gained confidence.

Learner Engagement and Enjoyment

According to the literature, motivation is strongly associated with

WTC (Peng, 2007; Peng & Woodrow, 2010; Yashima et al., 2004). People may experience pleasure because they learn something new or feel themselves part of the community of practice (Lave & Wenger, 1991) in which their interest is shared by a group of people within a specific domain. When this is the case, opportunities for personal and professional development arise. Under these conditions, they are bound to be motivated to participate to a greater extent. Additionally, it is important to note that topic familiarity seems to be a salient factor in terms of increasing task enjoyment, as found in a previous study (Cao, 2011).

> I feel that everyone is willing to participate in discussion and I am one of them. This kind of environment makes me feel very engaged and I like it very much!

> I will be enthusiastic to share my opinions particularly when the topics are interesting and the ones that I am familiar with.

In regard to the content of their presentations, the participants tended to independently explore relevant information as a way to further their knowledge of their topic. In terms of their perceptions of the skills and strategies they had developed through the program, most of the participants responded positively:

> Creativity and critical thinking. I learned that every time you look at one thing, you should think that there are other ways of seeing it.

> I learned how to elaborate on the original article with new information to make it more interesting.

> Some groups did very well on Q&A and discussion. They make the statistics chart to make the audience understand easily and also share their own opinions regarding the questions.

> Some groups will not go directly into the core message at the beginning. They may begin by asking questions, using hypothetic scenarios, or telling a story.

As can be seen from the statements, the participants learned to search for relevant information online to enrich their knowledge of the topic assigned in order to broaden the scope of their presentations. When people are driven motivationally, they tend to engage in given tasks as their desire and curiosity to learn have been kindled. In relation to learning about a subject, a person's interest in a subject propels them to explore additional sources with an open mind. In other words, learners are intrinsically motivated when they feel a sense of enjoyment or interest in undertaking the task at hand.

Intrinsic Motivation for Knowledge

The participants were encouraged to take ownership of their learning by asking questions throughout the course. The written reflection report showed that they were willing to communicate by posing questions or responding to others, and their willingness to do so gradually progressed as the course developed:

> I was unwilling to answer the questions in the beginning because I was afraid of making mistakes. Through the semester, I tried to answer questions and discovered that it has become easier for me to acquire knowledge when I tried to answer them.

> Initially, I didn't want to get any comment nor give any answer. But I've changed throughout this semester. Because I know that when you are giving a presentation, you can really use feedback. Not only will you get confidence but you will also be comforted.

> I feel that I can digest the information and comprehend the content more when I engage in the class discussion.

It is interesting to note that the participants reported they sometimes initiated a discussion or asked questions because they wanted to better understand the content covered in the presentation. For this reason, they would ask questions in order to clarify information or consolidate their ideas. Through negotiation and social discourse in the form of question-and-answer sessions, new information can be acquired and further reflection can take place. Interchange of this kind seems to engender learner motivation for

working on a task because they are excited by the prospect of learning something new (Noels et al., 2000; Vallerand, 1997).

It seems clear from the participants' responses that in accordance with MacIntyre et al.'s (1998) assertion, the importance of promoting interaction in the language classroom serves a dual purpose: it facilitates development of communication skills through practice by way of acquisition of the focal learning content and the target language input. The result lends empirical support to Skehan's (1998) observation that "learners have to talk in order to learn" (p. 48). In addition, initiating interaction is also helpful affectively as this practice reinforces the learner's sense of his/her competence as a speaker of the language.

Positive Feedback and Interaction

Constructive feedback and acknowledgment provided by the teacher was cited as critical by many of the participants in terms of supporting their efforts to become more confident speakers. This point is supported by Zarrinabadi (2014), who found that by scaffolding students cognitively and encouraging them emotionally, teachers play a crucial role in providing a supportive learning environment for students. With teacher support and scaffolding appropriate to the stage of development, the learners' fear of making mistakes is likely to be minimized, whereas their WTC is inclined to increase.

> I gradually felt less nervous because each time teacher's praise and encouragement made me experience a sense of growth and achievement.

> The group members told me that I've prepared well, therefore, it gave me more confidence to do the presentation.

Equally important to the participants' motivation to speak was their expectation of receiving supportive feedback from their peers, as demonstrated by the following quotes:

> I try to find a lot of relevant supplementary data to enhance my report in the preparation stage. I make sure my content is rich and ready to give them feedback and as long as they are attentive.

> I've always been willing to answer questions or express my thoughts. But for the 3rd and 4th presentation, I didn't really want to answer questions during certain groups' Q&A section. Sometimes, the speech was just really short or the presenters just rushed through the speech and didn't spend time on expressing their own thoughts. It made me feel that they didn't care about giving us (audience/classmates) an interesting speech.

The participants' replies are in accordance with previous findings in that the interlocutor's participation and readiness to engage in discourse tends to affect the learner's situational WTC (Cao & Philp, 2006; Peng, 2014). A presenter who feels that the audience is eager to listen feels motivated to share. By the same token, when an audience senses that a presenter is not fully engaged with the subject or committed to the task, they tend to lose interest and disengage as a consequence.

DISCUSSION

In response to research question 1, the results show that SPCC was highly correlated with the participants' WTC and IWTC. Follow-up multiple regressions further revealed that in accordance with empirical evidence reported in previous studies, SPCC had significant explanatory power for L2 WTC (MacIntyre et al., 2003; MacIntyre & Charos, 1996). The results suggest that learners who think they have a high level of communication competence tend to approach tasks more proactively and willingly than learners who do not think of themselves in this way. In other words, learners who see themselves as having a high level of communication competence appear to have a correspondingly higher level of readiness to overcome difficulties associated with assigned tasks. On the other hand, students with low SPCC may not take part in PBL fully, which would have a detrimental effect on their overall intention to initiate and sustain communication and, therefore, on their subsequent communicative behavior in the classroom.

Moreover, L2 IWTC was found to strongly predict L2 WTC. As stated earlier, WTC refers to a person's willingness to communicate with interlocutors at various levels of familiarity (i.e., friends, acquaintances, and strangers) across various social linguistic settings

(e.g., in dyad, group, and meeting settings, and in private and public contexts), whereas IWTC concerns a person's willingness to communicate with interlocutors of various ethnic, racial, cultural, and linguistic backgrounds. The findings suggest that learners who are open to participating in intercultural communication may be relatively tolerant of risks, as communicating cross-culturally demands language competence in order to cope with the increased stress of this kind of interaction. It follows naturally that those who perceive themselves as willing to engage in cross-cultural interaction are also likely to be keen to initiate conversation inter-culturally in a range of contexts. In regard to these results, it is reasonable to argue that the participants showed a high level of IWTC probably because they were studying at a university that advocates IaH and EMI (Chen, Cheng, Tang, & Wang, 2019). Further, given that the participants were all majoring in English, their high IWTC level was expected: that is, those who are initially motivated to learn a foreign language may be predisposed to engaging in intercultural communication (Fatemi et al., 2016).

Furthermore, according to our results, L2 communication anxiety is negatively correlated with L2 WTC, which aligns with results reported in the literature (MacIntyre & Charos, 1996; Papi, 2010). This makes sense as people who are apprehensive about their ability to successfully carry out a communicative task may not be inclined to initiate communication in the first place, let alone complete it.

With regard to research question 2, our findings indicated that PBL pedagogical implementation did provide students with opportunities to use the target language pragmatically and meaningfully, which manifested in the increased level of WTC and SPCC. This result is in accordance with Farouck (2016) who has shown that PBL can foster willingness to communicate. On the contrary, different from Farouck (2016) who found a decline in participants' degree of communication anxiety, our findings indicated an increased level of anxiety. However, it is necessary to exercise caution in interpreting the gains in communicative skills as a direct and sole result of the teaching approach (PBL) as many other cognitive, affective, motivational, and behavioral factors may influence learners' L2 WTC (MacIntyre et al., 1998). Nonetheless, the results of the present study do suggest that PBL was instrumental in building the participants' confidence and their L2 WTC in the process.

Finally, in response to research question 3, intrinsic motivation for knowledge, positive feedback and interaction, learner engagement and enjoyment, mastery experience and practice, and group member support were identified as factors that may be conducive to an

increased level of WTC in this study. The qualitative data gathered from the participants' written reports generally lent support to the quantitative results presented, such that a comprehensive and coherent picture of the interplay of the communication variables and the key features of the PBL course emerged. Each factor had either a direct or indirect regulating power in relation to the learners' relative confidence and anxiety, thereby shaping WTC.

This result is partially in line with Kang (2005) who found that psychological situations co-constructed by the interplay of various situational variables including "interlocutor(s), topic, and conversational context" (p. 291) exerted influence on communication intention. Our finding is also supported by Cao and Philp (2006) who showed that familiarity with an interlocutor and the dynamics of interlocutors' interaction are crucial to communication intention. In addition, the findings also corroborated Peng (2007) and Zarrinabadi (2014) which highlighted the importance of classroom context and the salient roles of a teacher in creating an autonomy-supportive classroom climate where group cohesiveness and teacher support are put in place.

Implications

The quantitative data collected for and presented in this study show that of all the communication variables included, SPCC was the strongest predictor of L2 WTC. Therefore, WTC may be attributable to a person's evaluation of his/her own communication competence. This finding is supported by results in the literature indicating that high SPCC results in high L2 WTC (Hashimoto, 2002; Öz et al., 2015). Moreover, the findings also indicated an inverse relationship between communication anxiety and L2 WTC, IWTC, and SPCC.

Therefore, educational programs and instruction should focus on supporting students in developing confidence in their use of the focal language and reducing their anxiety, both of which foster communication intention. In addition, IWTC was found to be closely associated with L2 WTC. However, while L2 WTC increased as the PBL course proceeded, their IWTC did not exhibit such a growth. Although the international news has been proven to positively increase students' intercultural competence, requiring students to analyze and interpret international events may not effectively increase their willingness to communicate across cultures. It is recommended that efforts be made to provide ample opportunities for intercultural

contact and where culturally mixed group projects can be implemented and integrated into the curriculum to promote both intercultural and intracultural communication.

Likewise, the findings derived from qualitative data also yield several implications for promoting learner engagement in PBL contexts. As a general observation, it is important to note that the participants had a generally positive attitude toward the PBL course. Next, the teachers encouraged the participants to prepare for their presentations based on a set of central themes and relevant resources, which encouraged significant independent work from the participants. In other words, PBL stimulates more learning gains achieved through activating cognitive curiosity and learner autonomy, both of which have been strongly linked to motivation (Ushioda, 2005). Therefore, it is recommended that PBL be integrated into English-language curricula to empower learners with a sense of ownership and self-regulatory capacity, which may foster L2 WTC in turn.

In addition, responses from the teacher and peers appear to have a powerful effect on WTC. The participants reported that their main motivation for initiating interaction was their close and supportive relationships with group members. Group cohesiveness is likely to be stronger when members are highly motivated, highly engaged in the focal task, and very committed to one another (Dörnyei & Murphey, 2003). The implication is that it is important to create a friendly and inclusive classroom culture where learners can experience a sense of belonging and security. Similarly, teachers must also motivate learners by promoting an autonomy-supportive learning environment. That is, students' willingness to learn and engage in a given task is contingent on whether the teacher provides sufficient scaffolding and constructive task-specific feedback.

Limitations

A possible limitation of the research design pertains to its applicability. The data were collected from a single group without the benefit of comparative data from an independent control group. This lack of comparative data means that although the intervention may have led to the improved outcomes found after the treatment, a definitive conclusion cannot be drawn on that point. That is, confounding factors such as history, maturation and testing, and statistical regression (i.e., regression toward the mean) may threaten the internal validity (Cook & Campbell, 1979). Therefore, it is

recommended that in future work in this vein, researchers include a control group in the research design to ensure validity. Finally, the configuration of the sample should be considered as a limitation: The participants were all English majors in their senior year, which means that they were likely to be somewhat comfortable with speaking an L2 as they self-selected to do so. In addition, they probably had acquired a high level of competency by the time the research was conducted. For this reason, there is a need to extend this research direction to examine different groups of learners with a diversity of backgrounds (e.g., non-English major students or lower achievers) to gain a more balanced picture of language learners' communication orientations in PBL contexts.

CONCLUSION

The purpose of this study was to gauge how communication variables may be shaped by the implementation of a PBL program. The findings show that PBL seemed to be successfully integrated into the semester-long special topic reports course in that both communication competence and willingness to communicate has to some degree increased at the end of the intervention, although it is less clear whether the improvement can be attributed to PBL alone. Importantly, learner communication apprehension does not decrease as a result of the implementation of PBL. Therefore, instructors need to create a supportive learning climate in which learners can experience a sense of belonging to groups and communities.

Since the main imperative of language learning is fostering effective communication and authentic language use, PBL allows the students to learn the language by using it. As learners pragmatically apply knowledge that they have acquired in the course to real-life events, they are empowered and motivated as a result.

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