Exploring the Factors Affecting the Effectiveness of Online Intercultural Communication

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Abstract—In reviewing the literature, the authors learned that the exchange of personal background knowledge can influence the effectiveness of intercultural communication, leading to an increase in divergent thinking. We also learned that intercultural communication attitude, uncertainty, social presence, and personal relationship are factors affecting the process and results of intercultural communication. We recruited seven dyads of American students and Chinese students to participate in a study requiring them to solve a social problem together online by using e-mail. The results of this study show that the participants with more personal background knowledge of each other came up with more divergent and original solutions to the problem, indicating a more effective intercultural communication. In addition, we found that intercultural communication attitude, social presence, and personal relationship are in fact significantly correlated. These findings have many implications: they can guide teachers in building more effective exchange programs, help virtual organizations increase the sense of community during collaboration, and inspire instructional technology designers to create better learning and working intercultural collaboration environments.

Index Terms — Divergent Thinking, Intercultural Communication Competence, Personal Background Knowledge, Social Presence.

I. INTRODUCTION

Intercultural communication is important in the 21st century and brings people many benefits. Positive outcomes of intercultural communication include prejudice and discrimination reduction [1-3], intercultural communication competence (ICC), and language development [4-8]. Besides these ambitious and integrative benefits, some researchers interested in the learning process, the authors included, find that intercultural communication can induce more reflection [9] during learning and be beneficial to divergent thinking and creative problem solving [10].

However, effective intercultural communication leading to expected results is not easy to achieve. The initial stereotype before communication, uncertainty in the communication, lack of social cues, and other conflicts that can occur during the contact make effective intercultural contact difficult to maintain. Therefore, just as researchers in intergroup contact, sociology, and conflict resolution have discovered time and time again, simply “getting people together does not work.” [11, 12] From the literature we learned that using personal background knowledge (PBK) [13] effectively can be a good path to effective intercultural communication. We learned that PBK can affect some important interrelated factors in the process of intercultural communication and lead to expected intercultural communication results. These factors emerging from the literature review are: intercultural communication attitudes, uncertainty, social presence, and personal relationships. That is, appropriate attitudes, more confidence in communication, higher social presence, and better personal relationships can be helpful in intercultural communication, whereas inappropriate attitudes, uncertainty, low social presence, and unstable personal relationships lead to less successful communication.

Further on, this paper reports on an experimental study that examined the personal background knowledge influence on the divergent thinking of interlocutors in a designed intercultural communication situation. Also, the paper explores the correlations of those factors cited in the literature as important to the process of communication, which can help to further understand the complex dynamics of intercultural communication.

II. LITERATURE REVIEW

A. Divergent thinking, creativity and multicultural experiences

Divergent thinking is essential to problem solving, especially in the initial stages. It has been thought that people with more intercultural experience will have a better chance of becoming IDEAL problem solvers because they have a larger repertoire of cultural schemas and that their schemas would be more complex than those of people with fewer cultural experiences [14]. One conclusion of a study on this [15] is that comparative thinking skills and cognitive flexibility are in fact encouraged by international education. In another study, Leung et al [10] proved that people with more multicultural experience are more creative.

Also, divergent thinking and cognitive flexibility help people avoid coming to quick and judgmental or stereotypical conclusions about new cultures and the people they encounter [16]. Learners need to gain experience with alternative ways to arrive at solutions and to develop the ability to reflect on which way of proceeding will work best for a particular problem under particular circumstances [17].
B. Emergent factors affecting intercultural communication effectiveness

Divergent thinking is the effective intercultural communication outcome we focus on in this study. But, as mentioned above, whatever the goals of intercultural communication, effective intercultural communication leading to expected results faces many problems. From the literature we learn that intercultural communication attitudes, uncertainty, social presence, and personal relationships emerge as the key factors in affecting effective intercultural communication.

1) Intercultural communication attitudes

By investigating the literature and via questionnaires given to scholars and administrators, Deardorff [15] developed a pyramid model of intercultural communication competence (ICC) consisting of four important components: attitudes, knowledge, and skills. Knowledge and skills comprise the second level. Knowledge includes cultural self-awareness, deep understanding and knowledge of culture, culture-specific information, and sociolinguistic awareness. Skills are the ability to listen, observe, interpret, analyze, evaluate, and relate. Attitudes including respect, openness, curiosity, and interest in discovery are the fundamental level of the model, and encourage people to acquire more knowledge and to develop skills.

It would be great if all individuals had the appropriate attitude for intercultural communication. It would also be great if these attitudes could be achieved by putting people from different cultures together. However, not all people have the right attitude before intercultural contact, so the idea that contact between cultures automatically leads to intercultural learning and to the development of a positive attitude toward the target culture has been rejected by many researchers [18].

2) Uncertainty

Berger and Calabrese [19] tell us that when strangers meet, one of the primary concerns is to reduce the level of uncertainty regarding each other’s behavior. Uncertainty refers to the inability to predict and explain others’ behavior, beliefs, attitudes, or values. Anxiety/uncertainty management (AUM) theory [20] was created to investigate the factors influencing effective interpersonal and intergroup communication. Gudykunst argues that individuals can communicate effectively to the extent that they are able to manage their uncertainty and accurately predict and explain others’ attitudes, feelings, and behaviors. And uncertainty management directly influences the effectiveness of communication in interpersonal and intergroup encounters. Later, many studies [21, 22] determined that anxiety and uncertainty are correlated to perceived effective communication.

3) Social presence

The term social presence was created by Short, Williams, and Christie [23], who defined it as “degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships...”

The reason that high social presence contributes to effective communication is related to a psychological concept: immediacy. Immediacy is a measure of the psychological distance between a communicator and his or her communication partner, and social presence is positively correlated to immediacy. A person can convey immediacy or non-immediacy nonverbally (physical proximity, formality of dress, and facial expression) as well as verbally [24]. In traditional face-to-face classroom work, many researchers have found that teachers’ immediacy behaviors are helpful in lessening the psychological distance to their students and lead to better learning [25]. Gunawardena and Zittle [26], in their study of the computer-mediated conferencing environment, prove that social presence related to immediacy is a predictor of satisfactory communication. Other studies [27, 28] also found that students’ perceived social presence of peers and teachers and their satisfaction with online discussions are strongly correlated.

Social presence is important for establishing a social space in which a structure can be found that encompasses social relationships, group cohesion, trust, and belonging, any of which contribute to open communication, critical thinking, supportive interaction, and social negotiation. This is why educators have found a positive relationship between social presence and learning performance in terms of learning outcomes and learner satisfaction.

4) Personal relationship

Personal relationship building is important in intercultural communication. Byram [4] maintains that the success of a communication situation depends not only on the efficiency of an information exchange but also on the degree of focus on establishing and maintaining relationships. Valued personal relationships have been found to be facilitative of rich telecollaborative encounters [6, 7]. O’Dowd found in her study that the interculturally rich relationships built between different e-mail exchange partners share some elements, like developing a personal friendly relationship, exchanging personal opinions around a topic, and recognizing and reacting to the needs and interests of the other. She concludes that the ability of the students to establish a personal relationship with their partners via e-mail was key to the successful development of intercultural communicative competence in the exchanges. Similar findings are mentioned by Belz [6]. Here, German and American students communicated through a program that aimed to develop their understanding of different education systems. This study explores the social and institutional factors that affect intercultural communication, in which Belz found that a personal relationship between students positively affected their communication. In fact, one of the students in the study attributed her heavy participation in the course to the personal relationship she built with her partner by saying, “I found it totally interesting to find out what Elizabeth (my partner) thought about, for example, American Beauty. The authentic communication which arose as a result of that really motivated me to write regularly, carefully, and with interest.” Different from this experience, though, many other students complained that they did not get the chance to create personal relationships with their partners.

C. Personal background knowledge

Intercultural communication attitudes, uncertainty, social presence, and personal relationship are factors correlated with and affecting the effectiveness of intercultural communication. If we can control these factors and adjust them, there will be more chance for us to obtain effective intercultural communication results.

By investigating the literature further, we found that personal background knowledge (PBK) can affect those
factors and so assist in fostering the effectiveness of intercultural communication. PBK as a type of deep personal information appears in a study that compared presenting a “general culture” versus presenting an individual from a culture [13]. The aim of the study was to prove that personal background knowledge about a foreign professor (Chinese) might change student attitudes, perceptions, and inferences about that professor from a different cultural background. The subjects (American students) were told that the professor had difficulty with her American students and were asked why this was happening and how to solve the problem. After collecting the answers, subjects were separated into two different groups to watch two different videos. One video was a general introduction to Chinese culture, the other was a video telling the story of the professor’s challenges with political and social change as a child and then coming to America. Afterward, the subjects were asked to answer the same questions again.

There was an interesting result from a comparison of the two student groups. Prior to watching the videos, most of the subjects thought the difficulties between the professor and students were attributable to the professor. Afterward, students who had learned about the professor’s life had changed their attitude. They were more receptive to reflection about student problems and more understanding of the professor’s behavior. Having knowledge of the professor’s personal background, the students became more likely to collaborate with the professor to solve problems. As for the students not receiving personal background knowledge of the professor: there was less willingness to work things out with the professor. Proper attitudes, like respect and open-mindedness, as described earlier, are significant factors leading to effective communication. In the study above, it was shown that PBK can be an effective method for changing intercultural communication attitudes. The reason for this might be because exchanging PBK raised the social presence and decreased the uncertainty of students toward the virtual professor, and so improved their perception of the professor. Then they were able to develop a better personal relationship.

As the literature mentions, social presence is not only a property of the medium, it can “be cultured” among teleconference participants through interpersonal relationship building. The personal background knowledge of the professor was created as a type of voiceover slideshow for the students. The life story of the professor and the real-life photos of the professor verbally and non-verbally increased the immediacy and “culture” social presence of the professor. Therefore, presenting the video resulted in perception changes among the students and interpersonal relationship changes between the students and the professor.

In addition, when we categorize strangers, or think about strangers and their groups, we form expectations of their behavior. How accurate our expectations or predictions are will affect how we interact with strangers [29]. The more accurate and positive the expectation we have of a stranger, the less uncertainty and anxiety we will feel communicating with him. To make accurate predictions, though, we need to have accurate information regarding strangers’ cultures, group memberships, and the individual strangers with whom we are communicating. In the study cited above, PBK afforded a clearer picture about the professor’s personal identification and social group identification, which helped the students obtain more accurate information, to reduce their uncertainty, and so make more accurate judgments.

III. RESEARCH QUESTIONS

From the literature, we know that PBK might affect the emergent interrelated factors and increase the effectiveness of intercultural communication. Therefore, after our literature review, we developed three research questions, as follows:

1. Does personal background knowledge lead to greater effectiveness of intercultural communication? Are there some differences between interlocutors with different culture backgrounds?
2. Does personal background knowledge lead to better intercultural communication attitude, decreased uncertainty, increased social presence, and personal relationship?
3. What are the correlations between the factors: intercultural communication attitudes, uncertainty, social presence, and personal relationships?

IV. METHODS

In this study, we designed an intercultural situation in which two people with different cultural backgrounds meet and communicate to solve a problem. Giving different interventions for the interlocutors and the same measures obtained from surveys and the communication procedural and results, we can analyze and draw conclusions to answer the research questions.

A. Participants

The U.S and Chinese cultures were selected as the two cultures for our experiment in intercultural communication. American and Chinese participants were recruited through flyers. The American participants were students in Chinese language classes at Columbia University and Northwestern University, and classmates or friends. The Chinese participants were college or graduate students of Beijing Normal University in China.

B. Design of Intercultural Communication Tasks

Intercultural specificity [9] is very important in intercultural communication because it gives people something concrete to communicate, think about, and reflect on. Therefore, the selection of the communication task in our study was a crucial step. First, the intercultural communication task should be something about which people from both cultures have a certain amount of knowledge. This gives people a shared basic interest and knowledge to start a conversation. Second, the participants from different cultures should have some opinions from different perspectives on the issue at hand. This will help to generate more interactions and reflection by the interlocutors during the communication. Third, the task should be described as specifically as possible so as to avoid widely diverse discussions of sub-topics. This last point is mainly a consideration from the perspective of the experiment. The narrower and more focused the communication, the easier the measurement. Otherwise, it will be hard to measure the contents of the communication.
of the different groups. Out of the lab setting, the selected intercultural communication tasks could be broader-range.

The communication task we decided on for this study deals with the “Made in China” problem, as described below:

“People usually associate the label “Made in China” with “Cheap Price.” Instead of just cheap prices, can “Made in China” also come to represent “High Quality”? In this regard, many people have suggested important strategies for the Chinese Government. Some of these include: strengthening quality control in manufacturing, encouraging innovation, and raising the education levels of employees. What are the specific methods required to realize the three main strategies? Please discuss this topic with your partner and come up with two or three specific solutions for realizing each of the strategies mentioned above. After discussion, please write an essay to summarize your discussion and your conclusions. You and your partner should each write an essay.”

C. Design of a Personal Background Knowledge Exchange Letter

The selection of which personal background knowledge is to be exchanged is important and relevant to how successful the study will be. For this study, we asked participants to exchange the following personal background knowledge in their introductory e-mail:

- Introduce yourself: name, gender, characteristics, interests, etc.
- Tell your partner your reason for learning Chinese/English and what about the Chinese/American culture you like.
- Describe to your partner your recent life (What are you doing every day? Is there anything that has made you very happy recently?)
- Share with your partner your short-term goals and your long-term goals, e.g., your career goal and your life goal.
- Tell your partner how you want to communicate and collaborate with him or her in the following days. For example: will you reply promptly? How often do you want to discuss things?

D. Measures

In the study, we use two methods to measure several variables related to the process and results of the intercultural communication. Some variables are captured by the surveys and some are coded from participants’ communication procedures and results.

1) Multicultural Experience Survey

For the purposes of intercultural communication, people with different prior multicultural experience have different mindsets that can lead to different behaviors and thinking. Therefore, prior multicultural experience (ME) becomes a nuisance variable in an experiment measuring personal background knowledge effects on an intercultural communication process and results. Therefore, information about this should be captured and used as a covariate when analyzing the data. The questions we used to capture subjects’ multicultural experience information were taken from Leung’s multicultural experience survey [10] with little modification.

2) Internet Experience Survey

If a study is conducted via the Internet, subjects’ Internet skills and knowledge could affect the communication process. We captured information on participants’ Internet experience(s) (IE) by using eight Likert scale rating questions asking about use frequency and the eight things people often do on the Internet.

3) Intercultural Communication Attitude Survey

This survey was created to capture subjects’ intercultural communication attitude (ICA) dimensions as described in the intercultural communication competence model of Byram [4] and Deardorff [15]. The factors of respect, openness (ambiguity of tolerance), curiosity, and discovery in the attitude dimension will be measured by nine Likert scale questions.

4) Attributional Confidence Survey

This survey will be used to capture the uncertainty factor mentioned by Gudykunst’s uncertainty and anxiety management theory. Clatterbuck’s measurement [30] were adapted for capturing attributional confidence (AC) (the inverse of uncertainty).

5) Social Presence Survey

This survey was used to capture the perceived partner’s social presence (SP) in the intercultural communication during the communication. It consists of 13 Likert scale questions and is adapted from the survey used by Choi and his colleagues [31].

6) Personal Relationship Survey

This survey was used to capture the personal relationship (PR) perceived after the communication. It consists of 2 Likert scale questions.

7) Personal Background Knowledge Percentage

The personal background knowledge percentage (PBKP) is a variable that measures the ratio of the number of personal background knowledge messages to the total number of messages in one dyad’s communication.

8) The Number of Solutions

One direct measure of the effectiveness of intercultural communication and solution divergence is the number of solutions (NOS). The more solutions participants come up with, the more effective the communication. Since we did not focus on actually solving the problem we posed, we did not consider the feasibility of the solutions.

9) Solution Divergence

Another measure of effectiveness and solution divergence (SD) involves the originality of solutions, which is an indicator of creativity. Therefore SD is a better measure for divergent thinking. A participant’s SD is calculated based on the frequency his solutions are mentioned by other participants. The more people who mention a solution, the higher frequency that solution has and the lower the score it contributes to SD.

E. Procedure and Result Coding

1) Communication process coding

After the interlocutors finished their conversations, we collected the messages they had sent each other during the communication and coded them. In the coding scheme, we defined three categories of message: personal background knowledge messages, task messages, and other messages. Every conversational message was coded based on this scheme. If a message was very long and contained two or
more different meanings, we separated the message and coded it for each meaningful portion.

2) Communication Result coding

All participant solutions summarized after completing the communication task were collected and classified into different categories. For each category, we calculated its frequency based on how many solutions belonged to it. With this coding scheme, we were then able to mark every participant’s solution with a category name and frequency, which led to an easy calculation of a final SD.

F. Procedures

In the study, both American and Chinese participants were first randomly put into two groups, called No-PBK group and PBK group, and then in each group an American participant was matched with a Chinese participant, same gender, in a dyad. After grouping and pairing, these participants were asked to complete a pre-survey consisting of the multicultural experience survey and the Internet experience survey. Then they were informed who was their partner and what was the communication task. Participants in the No-PBK group were told to start communication and finish the task in two weeks. The PBK group participants were told to do a personal background knowledge exchange by sending each other the introduction e-mail before working on the communication task. Their time for finishing the task was also about two weeks.

Participants communicated with each other by using e-mail and using English or Chinese to do so.

After the online communication, participants were asked to turn in a final essay concluding their discussion; then a follow-up survey, combining the intercultural communication attitude, attributional confidence, and social presence survey, was sent to each participant to complete.

V. RESULTS

24 subjects (12 American, 12 Chinese) were recruited in the study, but many of them did not complete the study for different reasons. In the end, 14 subjects (7 American, 7 Chinese) completed the study. Among the 14 subjects, 6 were female and 8 were male. The average age of the subjects was 23 years old. The American subjects’ average age was 26, and the Chinese subjects’ average age was 21. The average ages in the PBK and No-PBK groups were 23 and 24, respectively.

A. Research Question 1: Does Personal background knowledge lead to greater effectiveness of intercultural communication? Are there some differences between interlocutors with different culture backgrounds?

To test the effectiveness of intercultural communication and the difference(s) between American and Chinese participants, we did a 2x2 factorial ANCOVA analysis on two dependent variables, the number of solutions (NOS) and solution divergent (SD) variables, with PBK (Yes or No) and Culture (American and Chinese) as two between-subject factors, and ME and IE as covariates.

The results show that no tests were significant on NOS. However, the test on SD was significant ($F_{1,8} = 5.913$, $p=0.41$). There was no significant difference between the American and the Chinese on SD. PBK and culture interaction was not significant. Therefore, we can state that personal background knowledge had a strong effect on people’s divergent thinking about solutions, which means that the more people who receive personal background knowledge in the intercultural communication, the more creative and divergent the solutions they came up with from the intercultural communication. Fig. 1 shows the test results on solution divergence.

In the method part, someone may wonder if the personal background knowledge introduction letter provided enough PBK to the PBK group. They worried that the No-PBK group could also exchange personal background knowledge. To better understand the effect of the personal background knowledge exchange letter, we tested if the letter were effective enough to give more personal background knowledge to the interlocutors. A simple hypothesis was that the participants receiving a personal background knowledge letter would receive more personal background knowledge type messages. A similar 2x2 factorial ANCOVA analysis on the dependent variable PKMP was done and the results positively support the hypothesis. The PBK group got a significantly higher PKMP ($F_{1,8} = 110.974$, $p<.001$). Since there was no significant interaction between PBK and culture, we can state that the introduction letter had a strong effect on the percentage of personal background knowledge-type messages participants exchanged. This means that participants in the PBK group exchanged much more information related to their personal backgrounds.

B. Research Question 2: Does personal background knowledge lead to better intercultural communication attitude, decreased uncertainty, increased social presence, and personal relationship?

Based on the literature, the hypotheses were that personal background knowledge would influence personal relationship, social presence, attributional confidence, and intercultural communication attitude. 2x2 factorial ANCOVA analyses on the dependent variables PR, SP, AC, ACS were made for each of the variables. However, the results did not present any significant difference.

We hypothesized that personal background knowledge could help an interlocutor build a better personal relationship, social presence, and attributional confidence. However, the results did not present any significant difference.
relationship that could in turn be a reason to produce an effective intercultural communication. Although there was a rising trend of PR from the No-PBK group to the PBK group, the test shows that there was no significant effect. Further, personal background knowledge had no significant effects on other variables. Another multiple regression analysis, as well, did not present any correlations of these factors with NOS and SD.

C. Research Question 3: What are the correlations between the factors, intercultural communication attitudes, uncertainty, social presence and personal relationships?

In the literature review portion of our work, one of the hypotheses we had in mind was that personal relationship, social presence, attributional confidence, and intercultural communication attitude are interrelated. As a result, we believed changes in the variables PR, SP, AC and ICA would be correlated. In the study, we did a linear regression analysis and analyzed the interrelationships between these factors. In the analysis we control MES, IES and Culture variables. The testing results are shown in the table below (Table 8).

The tests show that there was in fact a positive significant correlation between PR and SP (F1,9 = 6.744, p = .029) and a positive significant correlation between PR and ICA (F1,9 = 5.574, p = .043), which means the positive change of social presence and intercultural communication attitude helped interlocutors establish stronger personal relationships. The test between SP and ICA was also significant (F1,9 = 12.723, p = .006), meaning that an increase in social presence helped participants develop a better intercultural communication attitude.

VI. Conclusion and Future Work

The expected outcomes of intercultural contact can be the increase of divergent thinking, the development of intercultural competence, the reduction of prejudice and discrimination, and finally the emergence of a peaceful world. Many researchers have tried to extrapolate their tremendous work in this area from the micro to the macro level but have found that this goal is not easy to achieve. Simply putting together people from different cultures or people with different ethnic backgrounds does not automatically make for good results. The dynamics of interaction in intercultural communication are complex, and deep investigation is required to determine the factors affecting the process.

In this study, we were exploring the process of intercultural communication and trying to determine what factors affect communication efficiency. In reviewing the literature we had found that personal background knowledge exchange between interlocutors can lead to a more effective intercultural communication. And the reason it can is because the exchange of personal background knowledge raises people’s social presence, decreases uncertainty, improves intercultural communication attitudes, and builds stronger personal relationships.

Our experimental results showed that our PBK treatment was effective and indeed increased the effectiveness of intercultural communication, stimulating more creative and divergent thinking in the interlocutors. Also, we found that among the factors involved, social presence and intercultural communication attitudes do support each other and assist in personal relationship building. However, we neither proved the influence of PBK on these factors nor found correlations for these factors with solution divergence and number of solutions. The reasons for this may be attributed to the limitations of this study.

Besides some small limitations, there are two big limitations in this study. First, the data were not enough. We had only 14 participants, 7 dyads. Second, people’s communication styles when using e-mail are hard to control. E-mail is an easy tool for everybody to communicate online. However, the problem of such asynchronous communication is that people who send messages cannot get immediate replies, which is not helpful for idea and relationship development. It could be due to these limitations that we failed to answer the second research question and did not find relationships between uncertainty and other factors. At present we are conducting another study that involves more than a hundred participants, using instant messenger as the communication tool. In addition, in the new study we have adjusted the measurements and added within-culture communication factor as to intercultural communication. The new study will avoid the problems we had in this study and will help us better understand the benefits of intercultural communication by comparing with within-culture communication and give us stronger evidence on which to base more general conclusions. In addition to the two limitations mentioned above, another lack of the first study is that the influence of PBK exchange on communication is not a solid theory and needs to be further developed. How to define and categorize PBK, and what kinds of personal background knowledge are more helpful than others, are questions that can be answered in a series of future, related studies.

Intercultural communication is important in this century. Knowing what are the potential problems of intercultural communication and finding methods to solve those problems will ensure that people can better understand one another, avoid conflicts, enjoy their communication, and obtain fruitful results from communication and collaboration. But breaking down the complex dynamics of intercultural communication has a long way to go, and we have made so far only a tiny step.

TABLE I.
MEANS, STANDARD DEVIATIONS AND INTERCORELATIONS FOR PERSONAL RELATIONSHIP SCORE

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
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<td>.280</td>
<td>.654</td>
<td>.812</td>
<td>.618*</td>
</tr>
<tr>
<td>Social Presence</td>
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<td>.152</td>
<td>-</td>
<td>.153</td>
<td>.765**</td>
</tr>
<tr>
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<td>.154</td>
<td>-</td>
<td>-</td>
<td>.068</td>
</tr>
<tr>
<td>Intercultural Communication Attitude</td>
<td>.51</td>
<td>.092</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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

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