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Cross-cultural management learning through innovative pedagogy: an exploratory study of globally distributed student teams

Abstract

This article presents an innovative pedagogy based on student participation in globally distributed project teams. The study questions the link between student learning of intercultural competence and this global teaming experience. Data was collected on 115 students participating in 22 virtual intercultural teams. Results reveal that students learned from the teaming experience, especially those who had more prior international experience. This study contributes to the development of the body of knowledge in innovative and collaborative pedagogy of global student teams and provides an analysis of the impact of the teaming experience on student learning as well as providing some insights on international and collaborative course design.

Keywords: collaborative pedagogy, cross-cultural training, intercultural teams, globally dispersed teams, intercultural sensitivity, intercultural competence, student learning, virtual teams

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INTRODUCTION

Today's global business environment is increasingly complex, and ever more companies and organizations use global teams to manage this complexity (Lane, Maznevski, Mendenhall, & McNeff, 2004). Virtual teamwork or distributed multinational and multicultural teams are becoming the norm in today's business world (Badrinarayanan, 2008; Jenster & Steiler, 2011) for global team operations. A recent survey by the intercultural training company RW3 of 3,300 companies from 103 countries found that 87% of white collar employees of multinational companies conduct at least part of their work virtually, yet only 16% had any training to prepare them (Solomon, 2012). These figures are still higher than similar results from 2001 which showed that nearly two-thirds of U.S. employees had engaged in virtual teamwork (Connaughton & Shuffler, 2007).

Identifying requisite skills and providing adequate training are essential for the effective management of virtual global teams. According to the RW3 study (Solomon, 2012), the top challenges for virtual teams are: cultural differences, time zone challenges, accents and communication styles. Aside from the expected technical skills within business or engineering organizations, for example, an appreciation and understanding for cultural, ethnic and gender diversity are critical factors required for success in global markets (Cronan, Douglas, Alnuaimi, & Schmidt, 2011; Long, Moos, & Bartel-Radic, 2012). Scholars have studied various aspects of both virtual teamwork and multicultural teams in terms of culture, distribution, team processes and trust (Klitmoller & Luring, 2013; Long & Carlo, 2013). This article examines global teaming from the viewpoint of student learning and the development of intercultural competence. The research explores the mutual links between students' intercultural competence and global teaming experience.

The paper is structured as follows: first, it presents an innovative collaborative pedagogy that consists of international virtual project teams. Then, a review of the literature on virtual teaming and intercultural competence is presented, followed by the method of the study. The results of the survey are analyzed and the links between the teaming experience and student learning of intercultural competence are discussed. Last, implications for student project design and avenues for future research are provided.

PRESENTATION OF AN INNOVATIVE PEDAGOGY: THE INTERNATIONAL VIRTUAL PROJECT TEAMS

History and description of the teaming experience

The innovative pedagogy studied in this paper grew from an existing exchange program between two of the partner universities, the business school of Missouri Southern State University (US1) and the business school of Universite de Savoie (F). Faculty on both sides (the authors of this paper) linked existing supply chain courses through common international student projects. The third university, the engineering management and systems engineering department at Missouri University of Science and Technology (US2) joined in the second year. In the third year, international projects were extended to international business courses as well.

The student projects are based on virtual multicultural teaming. During a semester, four or five teams, each including three or four students from the French university and two to five students from each of the participating American universities are set up – team size depends on the number of students enrolled in the relevant courses. Teams are assigned the goal of a deliverable report by a certain date (three to four months later) and instructed to provide a single unified report representing the total team's performance. Students only work together virtually, without the possibility of face-to-face meetings and collocated teamwork. Student participation is only for one term.

Faculty members from the three schools hold virtual meetings prior to the start of the course term to develop project themes and relevant subjects. At the start of the term, participating faculty propose several project subjects to their respective course students; student interest is used to assign teams consisting of students from each university. Teams are then given contact information and expected to initiate member-to-member contact and establish their communication methods and frequency. The various methods of communication and contact utilized are consistent with the attributes of an international classroom (Leask, 2004). Faculty provide some specific information regarding cultural differences between French and US cultures, University program differences and student profile differences (work, academic and degree program differences). The teams are required to produce one team report with presentations made at all three schools to require students to be familiar with the total project and contributions of their distributed team members. Subjects of the projects varied with the course concerned (supply chain management or international

business) and over time. Examples of subjects are the study of the global supply chain of specific multinational companies, the study of companies' entry modes in the BRIC countries, or comparisons between the US and French road transportation. Independently from the subjects, students were required to include general/theoretical information as well as empirical data from one or several companies studied, and to provide a comparative view (US vs. France or Europe).

The global teaming experience: a complex task

Work in global project teams is a complex task. Task complexity is a continuum with four major dimensions (Gluesing & Gibson, 2004): task environment (static/known or changing/uncertain), external coupling (team and task environment linking), internal coupling (team member-to-member relationships) and workflow interdependence. The task environment represents two countries. The task environment is the same over the teaming period, but is nonetheless different between the universities: criteria for a "good" student report differ between France and the USA, and between business and engineering schools. Moreover, project descriptions are created with some degree of deliberate complexity in terms of project milestones and deliverable objectives. External coupling differs between the French and the US schools as well, according to the study programs: the grade for the project account for about 13% of a semester for the French students (which is relatively high), and is double than for the American students (6% of a semester or extra credit within one course).

The intercultural and virtual nature of teamwork impacts team member-to-member relationships. Some degree of workflow interdependence is assured through the instruction to provide a single report representing the total teams' performance. Thereby, three dimensions of complexity are at an average level, while the fourth, member-to-member coupling, is maximized. As a result, one can consider the international projects as quite a complex task. This teaming pedagogy permits to confront the students with a situation that is similar to "real-life" experience: both the student teams and other global teams cope with team diversity and task complexity.

Research question formulation

This collaborative project has been carried out during ten consecutive semesters and ranges from three to eight international student teams every term. Faculty in charge of the projects (the authors) debriefed students' teaming experience every mid-term and end of term. Students'

feedback was noted for further use. The predominating remark was that the global teaming experience was difficult and sometimes frustrating, but that it caused learning that the students had not realized through other courses or experience. After four semesters, faculty intended to more systematically explore the following questions: to what extent do students learn intercultural competence through the global teamwork? Which students learn most from the experience, those with more or less former international experience? Do teams with higher international experience and intercultural competence work together more smoothly and effectively? As a result, a survey was developed and administered to the students during the six following semesters. Method and results of this study will be presented after a review of the literature.

LITERATURE REVIEW

Multinational companies increasingly use virtual teams. Zakaria, Amelinckx, and Wilemon (2004) predicted that 60 per cent of the professional and management tasks at Global 2000 companies would be done via virtual teams, and that nearly 50 percent of these teams would fail. The predictions of intensity have even been surpassed because, according to the RW3 study (Solomon, 2012), 87% of white collar employees of multinational companies conduct at least part of their work virtually. Failure rates are difficult to assess, but communication difficulties, cultural differences and time-zones have frequently been cited by scholars as the most significant constraints that must be overcome to achieve team effectiveness in a global context (Yuan & Gay, 2006). Leaders of cross-cultural virtual project teams report that the main challenges are leadership, managing virtual aspects of communication and developing trust, but also managing language and cultural issues (Oertig & Buergi, 2006). Among those key challenges, this paper focuses on cultural differences, and the notion of intercultural competence as a mean to overcome those effectively.

Global Teamwork and Virtual Communication

Virtual teamwork or global virtual teams refer, for the purposes of this study, to temporary teams that consist of members from more than one culture and from more than one location that accomplish the tasks of the team in any of several communications methodologies that do not include face-to-face meetings. Scholars have referred to such teams by various names including global(ly) distributed teams, cross-cultural distributed teams, geographically dispersed teams and more commonly virtual teams (Connaughton, 2007; Horwitz & Horwitz, 2007; Jarvenpaa &

Leidner, 1999). The term of global teams designates teams that are characterized by national, cultural and linguistic heterogeneity and operate in a globally dispersed virtual environment (Zander, Mockaitis & Butler, 2012) and will be kept throughout this paper.

Virtual communication, regardless of the technology used, has been cited as disruptive to normal communications patterns and containing a lack of richness that causes misinterpretation and misunderstanding (Distefano & Maznevski, 2000; Maznevski & Chudoba, 2000; Maznevski, Canney Davison & Jonsen, 2006). At the same time the asynchronous nature of some technology and lack of face-to-face communication has also been cited as an ameliorating influence allowing for less contextual and cultural cues thereby reducing conflict and social fragmentation to foster more positive team outcomes (Stahl, Masnevski, Voigt, & Jonsen, 2010).

The increase in computer-mediated activities, including a reliance on computer-mediated communications for virtual teams to complete work related tasks, has supported globalization (Johnson, Bettenhausen, & Gibbons, 2009). The RW3 survey (Solomon, 2012) confirmed previous research regarding the dimensions of team virtuality such as Kirkman and Mathieu's (2005) communication tools, information richness of those tools and synchronicity of communication; or Martins, Gilson and Maynard's (2004) dimensions of geographic dispersion, use of computer based communications, temporality and diversity. Perhaps the most comprehensive study has been that of Chudoba, Wynn, Lu and Watson-Manheim (2005) which identified six dimensions: geography, time zone, culture, work practices, organization and technology. Teams need time to progress through the non-task related activities of forming, storming, and norming to arrive at the task related performing stage (Tuckman & Jensen, 1977), and intercultural teams need more time than homogeneous teams to do so (Adler, 2002). Research has shown that virtual teams have lower levels of satisfaction than face-to-face teams and have fewer informal interactions between team members (Baltes et al., 2002; Tangirala & Alge, 2004).

Intercultural competence

Culture is a system of meanings shared by a group (Geertz, 1973), whether this group is a nation, an organization, or any other type of group with relatively stable membership over time. Cultures differ in aspects such as core values, beliefs, customs and rituals. Research suggests that cultural difference represents a challenge to communication effectiveness and knowledge sharing

in general and specifically to exchanges of complex ideas (Gluesing & Gibson, 2004; Maznevski et al, 2006; Stahl et al, 2010).

Intercultural competence is considered as helpful in intercultural communication effectiveness. Various scholars have attempted to define the concept of intercultural competence but there is still no consensus on the definition (Spitzberg & Changnon, 2009). Hunter, White and Godbey (2006) defined intercultural competence as having an open mind while actively seeking to understand cultural norms and expectations of others, using this gained knowledge to interact, communicate and work effectively outside one's environment. Deardorff (2006) stated that intercultural competence comprehends the skills necessary to analyze, interpret and relate, the skills to listen and observe as well as cognitive skills, critical thinking and cognitive flexibility. Brustein (2007) defined global competence as including the ability to work effectively in international settings, awareness of and adaptability to diverse cultures, perceptions and approaches and familiarity with the major global issues and changes occurring as well as the capacity for effective communications across cultural and linguistic boundaries. The common thread in all these definitions is the emphasis on communication, effective cross-cultural relationships and knowledge of the other culture (Moos & Vernon, 2009). Intercultural competence may be a set of behaviors, knowledge and attitudes that enable effective work in cross-cultural settings (Jirwe et al., 2009). But having specific knowledge about a culture may be just as dangerous as it is advantageous since having specific knowledge about a culture may lead to the formation of stereotypical assumptions about individuals from the [other] culture (Jirwe, Gerrish, Keeney & Emami, 2009). For the purposes of this study, intercultural competence is defined as an ability to interact effectively with people of different cultures (Sjoberg & Shabalina, 2010). This definition is close to that of other terms proposed in related research, notably “cross-cultural competence” (Johnson et al., 2006), “cultural intelligence” (Earley & Ang, 2003) and “global mindset” (Levy et al., 2007)

Intercultural competence largely depends on a person's mental models (views of the other and of foreignness) which can evolve through an intercultural learning process including intercultural experience and critical reflection (Bartel-Radic, 2014). Bennett (1993) uses the term of intercultural sensitivity, defined as orientation toward cultural difference. He proposed the Developmental Model of Intercultural Sensitivity (DMIS), a dynamic learning perspective including six stages of intercultural sensitivity, subdivided into three ethnocentric stages and three

ethno-relative stages. Ethnocentrism, “a view of things in which one's own group is the center of everything, and all others are scaled and rated with reference to it” (Neuliep, 2002, p. 201) means the absence or lack of intercultural competence. The opposite of ethnocentrism, meaning a view of things that integrates, or at least admits various frames of reference, is termed ethnorelativism by Bennett (1993). The three ethno-relative stages of the DMIS include learning outcomes of intercultural competence. This conception of intercultural competence development moves through cognitive, affective and behavioral dimensions and is similar to Kolb’s experiential learning theory (1984). Simply stated learning begins with an experience that through reflection and further experiences is used to create generalizations and conceptualizations (Kolb, 1984). This creates an affective state that is used to evaluate further experiences, refine further conceptualizations and continues the cycle of learning (Pagano & Roselle, 2009). Cross-cultural experiences containing greater cross-cultural interactions or contact called “high-contact experiences” (like global teams) result in greater cross-cultural adjustment and less interaction than “low-contact experiences” (Caliguri, 2000). Research has also shown that the more peer-level interaction people have with people from other cultures, the more positive attitudes will be toward the people from that cultural group (Amir, 1969). Contact theory suggests that experiences should offer meaningful peer-level interactions, opportunities to work together toward a common goal, and an environment that supports the interactions (Pettigrew & Tropp, 2006).

As presented in the literature, global teamwork and intercultural competence mutually influence each other. Intercultural competence is necessary for well-functioning and successful intercultural teamwork; communication over distance does not reduce the impact of cultural differences. In turn, global teaming represents an experience for the development of intercultural competence. Infrequent communication over distance makes the global teaming a low-contact experience, therefore learning cannot be expected to be very high. Nevertheless, the teams provide the students with practical experience that can make them realize the existence of cultural differences, and initiate learning of intercultural competence.

METHODOLOGY

A quantitative survey was used to measure intercultural competence and learning outcomes among the participants, and to question which students learned most from the teaming experience. Data was collected on 115 students of the three universities, participating in 22 intercultural virtual

teams. The study questionnaire was designed to explore the relationship between the global teaming experience, students' intercultural competence and student learning and consider the research questions identified from data analysis at the conclusion of the fourth semester of the global projects.

Survey instrument

The survey examined the communications, learning, and intercultural competence development of students through virtual, global projects. The survey instrument consisted of a total of 60 items.

Measure of intercultural competence was based on 30 items developed from Bennett's (1993) six DMIS stages. As defined above, the six stages are divided in two groups, ethnocentric stages (absence of intercultural competence) and ethnorelative stages (signifying intercultural competence). Ethnocentrism includes denial of cultural differences, defense of home cultural values, and minimization of cultural differences. Sample items are "All I need to know about a foreign country is politics and history - I can figure out the rest of it as I go along" (denial), "When you go to other countries, it makes you realize how much better your country is" (defense) or "Technology is bringing cultural uniformity to the developed world" (minimization). Ethnorelative stages include acceptance of cultural differences, adaptation to cultural differences and integration into multiple cultural frames. Items include "I always try to study about a new culture before I go there or work with people from there" (acceptance), "I know that my foreign colleagues are really trying hard to adapt to my style, so it's fair that I try to meet them halfway" (adaptation) and "Whatever the situation, I can usually look at it from a variety of cultural points of view" (integration). Students were requested to indicate their degree of agreement which each statement on a 5-point Likert scale, at the end of teamwork, and also, retrospectively, six months earlier, before the beginning of the teamwork.

Students' evaluation of team processes, outcomes and learning was measured with 12 items that are based on students' self-assessment of their communication expectations and methods, teamwork processes and outcomes, and degree of learning. The authors developed the questions on the basis of semi-directive interviews and collective feedback from group sessions with the 2008 and 2009 virtual teams. Emphasis was given to content expertise and specific statements made by students concerning their teaming experience and team results. The intent of these items

was to test the extent to which these opinions are generalizable to the sample population and explores correlations with other elements of team processes and outcomes, and with intercultural sensitivity and learning. Items are quoted in table 1.

Communication modes within the team were measured with 4 items (see table 2).

Prior international experience was measured with 11 items, merged into four indicators: travelling and life abroad, intercultural contact (through job or university or in private life) and foreign language proficiency. The remaining 3 items covered demographic attributes (gender, university, citizenship).

Sample

The sample of this study consisted of $n = 115$ students studying at the two U.S. universities (48 students) and the French university (62 students) and participating in the global project teams. Students enrolled in the two courses concerned (international business and supply chain management) were administered the survey instrument over six different semesters beginning in the winter of 2010 and ending in the spring of 2013 (with each students participating only once in the projects, and answering the survey only once); the sample consisted of 22 different global teams. The sample was 54 percent female. 37 percent of the students had a US-American citizenship and 52 percent had French citizenship, in total, students have citizenship of ten different countries (with some students having more than one citizenship).

Analytical Methodology

The data in the study were analyzed using the SPSS statistical package, version 17.

The 30 items relating to Bennett's (1993) DMIS used a 5 point Likert scale in order to measure student intercultural competence. Factor analysis was run on these scales in order to ensure uni-dimensionality of the scales. Items with low loading on the factors were withdrawn. The scales below are uni-dimensional and are based on 4 to 5 items each. Cronbach's alpha was run on the items remaining in the DMIS scales (see table 3). Hammer, Bennett and Wiseman (2003) confirmed 5 of the original 6 DMIS scales through reliability analyses and construct validity tests. In this study, reliability coefficients are rather low for most of the scales, but given the exploratory nature of the study it is still possible to draw some insights from the results.

Reliability is too low ($\alpha < .5$) for the “defense” scale, so those results were eliminated from this study.

Data analysis calculated mean comparison on before and after teamwork intercultural competence, as well as on differences in intercultural competence, learning or satisfaction between several categories of groups (like US-based vs. France-based students). The change between before and after teamwork intercultural competence (measured through change in DMIS scales) was in the expected sense (decrease in ethnocentric stages and increase in ethnorelative stages), but very small and, therefore, not significant. The analysis of changes in intercultural sensitivity was therefore dropped from further analysis. Mean comparisons between groups (US vs France based students; gender) were also not significant.

The main focus of analysis was put on correlations between teamwork, communication and learning variables (see tables 1 and 2), the DMIS scales and previous international experience (table 3). Statistical analyses included descriptive statistics and Pearson bilateral correlations coefficients as well as linear regressions.

RESULTS

Team interaction and communication, and outcomes

Table 1 shows descriptive statistics (mean and standard deviation) for the twelve “teamwork” items, bilateral Pearson correlations between them and their significance.

Insert table 1 here

Results show that the more students expected teamwork to be easy, the more they were surprised by the difficulty of communication with their teammates ($p = .36^{***}$), and the less team output’s quality met the students’ initial expectations ($p = .24^*$). The quality of team output did also not meet expectations when unexpected communication difficulties appeared ($p = .37^{***}$) and when the team experienced conflict ($p = .22^*$). The more communication difficulties between team members were above expectations, the more the team met conflict ($p = .34^{***}$), the less students liked the virtual teaming experience ($p = -.29^{**}$) and the more they were frustrated ($p =$

.34***). Students were also more frustrated when the team met conflict ($p = .43***$) and when team results were below their expectations ($p = .46***$). Linear regression analysis shows that good team functioning (T11) is explained by 40% by accurate expectations concerning ease of communication (T1), output quality (T4), appreciation of global teamwork (T5) and low team conflict (T7) (R^2 adjusted = .40***).

Teams were free to choose team leaders in each university, and to communicate with the foreign teammates via those team leaders. A majority of teams (deliberately or implicitly) functioned with those team leaders (mean close to 4, “agree”), but this way of organizing is not significantly correlated to student expectations, conflict, satisfaction or team outcomes.

Students increasingly consider that their team developed into a well-functioning workgroup when they did not underestimate the difficulty of interaction ($p = -.42***$), when output met their expectations ($p = -.52***$), there was low conflict ($p = -.37***$) and frustration ($p = -.45***$). The better the team functioned at the end of teamwork, the more students liked the teaming experience ($p = .36***$). Regression analysis indicates that team output below student expectations (T4) is explained by 32% by communication that is more difficult than expected (T2) and a team that does not work together well (-T11) (R^2 adjusted = .32***).

Table 2 displays the use of different communication modes by the students. Contact with distant teammates was realized most frequently via e-mails (highest mean; $p = .37***$).

Insert table 2 here

Correlations between communication modes and team process and outcome indicators show that the more students communicated within the team, the less they were frustrated ($p = -.30**$), the better the team functioned in the end ($p = .24*$) and the less output was below students' expectations ($p = -.36***$). Communication intensity (C1) accounts for 12% in team output meeting student expectations (T4) (R^2 adj = .12***). Communication via e-mail was most common, but is not correlated significantly to these positive outcomes. Students' frustration was lower when they shared documents on a common platform ($p = -.22*$) or talked to each other on skype or the phone ($p = -.26**$).

Student learning

Being asked if they had “learned a lot” from the global experience (5-point Likert scale), only 12.2% of students responded negatively, while 68.7% indicated that they had “learned a lot” from the experience. These figures confirmed qualitative and informal feedback from the students. The students who consider to have learned most from the teaming experience are also those who liked the teamwork most ($p = .48^{***}$), and were less frustrated by the cooperation ($p = -.32^{***}$). The better the team worked together, the higher the students evaluate their learning ($p = .41^{***}$). The higher the students’ expectations concerning team outputs, the more they learned ($p = .23^*$). Self-assessed learning is explained by 30% by high expectations (T3), liking of the global teamwork (T5) and work in a well-functioning team (T11) ($R^2_{adj} = .30^{***}$).

Teams that were in contact more frequently ($p = .22^*$) and that shared documents on Facebook, Google docs or Yahoo groups ($p = .26^{**}$) evaluated their learning to be greater. Self-assessed learning (T12) is explained by 8% by communication intensity (C1) and document sharing (C3) ($R^2_{adj} = .08^{**}$).

Intercultural competence

Intercultural competence was assessed with Bennett’s (1993) stages of intercultural sensitivity. Table 3 shows Cronbach alphas, means and standard deviation for the five stages that remained after data analysis, as well as bivariate Pearson correlations between the stages and teamwork and learning items, and dimensions of prior international experience.

Insert table 3 here

Results show that students score lowest on “denial”, and highest on “acceptance” of cultural differences. Therefore, it can be stated that the students possess intercultural competence. It could be expected that students with higher intercultural competence work more easily and effectively in global teams. Indeed, students who score higher on “adaptation” and “integration” are less frustrated with team functioning ($p = -.22^*$ and $p = -.30^{***}$). Higher “integration” explains lower frustration by 8% (R^2 adjusted = $.08^{**}$). Higher “adaptation” is also correlated with team

outputs that are not below expectations ($p = -.23^*$). Unlike expected, but somehow logical, the better a team functioned, the more students deny or minimize the existence of cultural differences ($p = .19^*$ and $p = .29^{**}$). This result shows that a team that functions very smoothly offers less opportunities for noticing cultural differences, and therefore for learning.

“Acceptance” of cultural differences is positively correlated to students’ perception of their learning thanks to the teaming experience ($p = .22^*$). This correlation could imply two processes: on the one hand, the more students learn from the teaming experience, the more they accept the existence of cultural differences. On the other hand, the more students are conscious about cultural differences, the more they benefit from the teaming experience for learning.

Prior International Experience

It was expected that students with more prior international experience deal with the international teamwork more easily. Results only partially confirm this expectation (see table 3). Travel experience, life abroad and foreign language proficiency are not significantly correlated with team interaction items. But the more students interact with foreign people in their private life, jobs, or at university (outside of the global teams), the less they are frustrated with the international teamwork ($p = -.20^*$), and the more they perceive the team as a well-functioning unit ($p = .26^{**}$). Linear regression analyses indicate that functioning of the team (T11) is explained by 10% by international experience (travel experience and intercultural interaction; $r^2_{\text{adjusted}} = .10^{***}$).

As to be expected, students with more prior international experience have higher intercultural competence. This correlation clearly appears in the data: students with higher foreign language proficiency minimize cultural differences less ($p = -.22^*$). All four dimensions of international experience are correlated with stronger integration of multiple cultural frames (see table 3; correlation with international interaction $p = .46^{***}$). The impact of travel experience, life abroad and intercultural interaction on “integration” amounts 26% ($r^2_{\text{adj}} = .26^{***}$). International interaction is also correlated with higher adaptation to cultural differences ($p = .26^{**}$).

Qualitative feedback from students did not permit a clear expectation concerning which students learned most from the international teams, those with more or less prior international experience. Survey results are also ambivalent on this point. On the one hand, self-reported learning from international projects was higher when it is combined with prior intercultural experience gained through a job or at university ($p = .31^{***}$). Regression analyses show that the

impact of international experience (travel experience and intercultural interaction) on self-assessed learning amounts 13% ($r^2_{adj} = .13^{***}$). Students with prior work or academic international experience reported higher learning from the virtual experience and higher expectations of difficulty in working in virtual intercultural teams. On the other hand, learning from the international projects was also higher when students were completely lacking former international experience. Detailed stratification on the international experience variables showed that the less students had formerly travelled abroad for tourism, the more they learned from the teamwork ($p = .25^{**}$).

DISCUSSION AND IMPLICATIONS

This section presents the implications of the results for theory and teaming pedagogy design. The exploratory nature of this study does not permit conclusions on a generalizable model of global teaming, intercultural competence and learning. But results, nevertheless, converge with the literature in several points. Discussion will lead to the formulation of theoretical propositions. These propositions are supported by literature and the results of this exploratory study, but should be further tested in future research.

The first area of discussion concerns **student expectations** of the difficulty of global teamwork. The results show that students who initially believed they would not struggle with the challenges of global teaming encountered more difficulties during teamwork, and considered team output as poorer. These same student teams were unable to successfully adapt if communication issues arose and were not able to recover once frustration emerged as part of teaming behaviors. Comments from students acknowledged cultural differences and typically placed the cause of frustration on the lack of work or communications from international team mates (Long, Moos, and Bartel-Radic, 2012; Long and Carlo, 2013).

Proposition (P)1: Accurate expectations concerning the difficulties of global teaming improve teamwork processes and team performance.

Prior international experience shows a distinct difference between employment or academic based international experiences and tourism travel. It may well point to an over confidence by students with only tourism-based international travel. Research has indicated that individuals with varied intercultural experiences have much less optimism about the capacity to communicate

effectively on complex issues than do individuals with singular or specific international experiences (Long and Carlo, 2013; Leask, 2004). This supports a conclusion of over confidence. Moreover, students with greater previous international experience show a better perception of team processes and displayed higher levels of intercultural competence. The results of this study are consistent with Bartel-Radic's (2014) finding that international experience has a significant but low impact on intercultural competence.

P2: Prior international experience positively influences global team collaboration and student intercultural competence.

With respect to learning outcomes related to the global teaming experience, results of the study are ambivalent: learning is higher for students with more international experience, but also for students without any international experience. This points towards a non-linear correlation between international experience and intercultural learning, a result also found by Bartel-Radic (2014).

P3: Learning from the global teams is higher for both students with no prior international experience and students with substantial prior international experience.

Results show that students who communicated to a greater extent, had lower frustration, and evaluated learning more positively. There are positive correlations in terms of student learning and the reduction of frustration when higher **levels of communication** were established. These student teams had a higher expectation of difficulty and more ably created mitigation strategies to improve communication channels, talk through frustrations or concerns, and evaluate work outputs. Sharing documents using a technology platform such as Google Groups or Dropbox, then discussing the documents using Skype or other telecommunication platforms were positively correlated with high team performance and satisfaction. These groups stated in comments that after initial meetings, they did not notice cultural differences any longer. The concept of media richness might be helpful to better understand the links between global teaming and intercultural learning. Klitmoller and Lauring (2013) show that certain type of media are more useful for a certain type of knowledge sharing in global teams. This study suggests that media richness and communication intensity not only impacts global team processes and output, but also intercultural learning.

P4: Higher levels of communication facilitate global teamwork and improve learning outcomes.

Those groups who performed well with the virtual teaming experiences scored higher on adaptation and integration elements of the Bennett's Stages, which means that they displayed greater **intercultural competence**. These students were able to place greater efforts toward communication, establish a common basis for communications and therefore have an increased sharing of knowledge and task related information. Coherently with these results, literature designates cultural issues as being among the main challenges when working in global teams (Yuan & Gay, 2006; Oertig & Buergi, 2006), and intercultural competence as a key competence for leaders of global teams (Hajro & Pudelko, 2010; Zander et al., 2012).

P5: Intercultural competence improves students' ability to work successfully in a global team.

One of the main objectives of this study was to determine the **impact of the global teaming experience on intercultural competence and student learning**. Self-assessed student learning from the global teams is high. These results are similar to those of short-term sojourner study abroad results as expressed in Kim's (2001) integrative theory of communication and cross-cultural adaptation. The experience of communication stress creates a brief withdrawal and then as the experience is conceptualized into new communicative behaviors the sojourner develops more successful communication strategies and become more cultural adept (Pitts, 2009).

This study questioned changes in intercultural sensitivity through the retrospective assessment of Bennett's DMIS stages. Results showed small, but not significant increase of intercultural competence after the global teaming experience. It is most likely not any single international experience that creates intercultural competence, but rather the combination and continuing international experience that forms the basis for such competence. It has been shown that while the greater the international experience the greater the competence, the link is neither linear nor simplistic (Bartel-Radic, 2014). Intercultural competence is a multidimensional construct that includes the cognitive, affective and behavioral aspects as proposed by Bennett (1993), and does not easily evolve. The global teaming experience probably is not a sufficiently "high-context experience" (Caliguiri, 2000) to significantly increase intercultural competence.

P6: The global teaming experience permits student learning, but is not sufficient for a significant increase in student intercultural competence.

Finally, several aspects of the results point toward the need for a **process approach** of global teamwork. One aspect is that students who failed to understand the complexity of the virtual teaming experience were frequently unable to recover when communication or productivity failed to meet initial expectations. In other words, once first difficulties arose, the teams struggled or were unable to find a way out of these difficulties. Another aspect is the ambivalent role of conflict in the data: on the one hand, team conflict is correlated with frustration and team output below expectations. On the other hand, team conflict is correlated to student learning. Both aspects point toward the risk of intercultural teams getting caught in vicious circles (Adler, 2002) where non-cultural difficulties increase the perception of cultural differences and even culturally stereotyped behavior, which in turn adds to collaboration difficulties. Team conflict has been identified by the literature as being potentially favorable to intercultural learning (Bartel-Radic, 2006) and more generally to bring up valuable results if the team displays equal power structures and common goals (Eisenhardt, Kahwajy, & Bourgois, 1997).

P7: Global teamwork shall be studied in a process approach to account for the role of team conflict on team outcomes and student learning.

CONCLUSIONS

Intercultural competence and global teaming are both important skills for employment. This paper has presented global student teams as an innovative pedagogy for higher education, permitting to provide skills and experience in both areas. The study has attempted to explore the links between the global student teaming experience, and student intercultural competence and learning. The results shed some light on aspects of student global teaming and the development of intercultural competence. But more importantly, the global teaming experience can be considered as a pioneering effort that can help higher education to further develop and explore pedagogies directed to better preparing students for careers in today's globalized world.

Recommendations for student global teaming design

The fact that the global teaming experience did not significantly raise intercultural competence in the student sample does not mean that such internationalizing efforts and activities should be removed from the classroom or that study abroad should be eliminated. Instead, such activities should occur with continuing frequency in several different mediums, including face-to-face, virtual and in the typical cognitive classroom learning environment. Students must be taught about intercultural competence and must have intercultural experiences on a continuing basis to allow the experience-reflection-conceptualization of learning to occur.

The authors' experience and the results of this study show that teams must be provided with substantial cognitive information regarding communication difficulties and expectations. Obvious differences such as time zones and language are presented, but maybe not deeply enough for students without any international experience. Team coordinators should highlight the difficulty of the global teams, to improve team processes and outcomes and student learning. Team membership was not assigned by the professors coordinating the global teaming experience, but by students themselves. The results show that students lacking international experience underestimate difficulties, in turn face more problems during teamwork, and evaluate team output and personal learning as being lower. Using student expectations and previous international experience in the assignment of team membership should help "mixing" the teams, increase positive feelings about teamwork, and improve learning from the experience.

Teams must determine their own communications plans and were given information regarding using Facebook, Google docs, Yahoo groups, email, Skype and instant messaging. The choice of communications mediums was left to each team. Results of this study strongly suggest the necessity of requiring students to use platforms for sharing documents and task information, and to communicate on a regular basis on the phone or via Skype. Both communication modes improved student learning as well as team performance.

In the data, team conflict is linked to frustration and poorer team output, but also to student learning. Therefore, some conflict can be beneficial, but conflict should not be too strong, and not persist too long. The teams might otherwise stuck in vicious circles where perception of cultural differences and of difficulty of collaboration mutually increase each other, leading to frustration and poor output. Faculty should, and can certainly play a role in maintaining conflict at an appropriate level. This requires quite close follow-up of the teams, and frequent communication between faculty from the different universities.

Limitations

The survey instrument utilized was based upon students' self-reported demographics and experiences in response to survey questions. While survey instructions and conditions did encourage honest and sincere responses, students may have been affected by positive or negative feelings towards the course, course instructors or teammates. Obtaining accurate and meaningful data to assess the impact of a project can be difficult, especially when it is distributed across multiple universities and countries.

Adding to the difficulty, the study attempted to measure self-reported progress in personal learning in a retrospective assessment. Considerable empirical evidence suggests that program effects based on pre-/post-test self-reports are masked because people either *overestimate* or *underestimate* pre-program knowledge, skill, or perceptions (Bray, Maxwell, & Howard, 1984; Hill & Betz, 2005; Hoogstraten 1982; Klatt & Taylor-Powell, 2005; Nimon, Zigarmiand, & Allen, 2011; Pratt, Mcguigan, & Katzev, 2000). Participants also gain new understandings of the concepts being investigated and cause a response-shift bias in answering questions from pretest to post-test (Klatt & Taylor-Powell, 2005). Moore and Tananis (2009) report that response shift can occur in educational programs, especially when specifically designed to increase students' awareness of a specific construct that is being measured. Yet, as the results showed no significant change in intercultural competence (DMIS stages), data analysis and interpretation are only marginally based on retrospective assessment, therefore limiting the impact of related bias.

Research avenues

The main limitation of this study lies in its exploratory nature. The size of the sample does not allow for confirmatory data analysis or structural equations modelling. More research is needed to distinguish the links between global student teaming, intercultural competence, prior international experience and student learning more accurately. The measurement tool for intercultural competence chosen in this study (based on Bennett's DMIS stages) did not permit to capture significant changes in intercultural competence, while students indicated having learned a lot. Measuring intercultural competence is a complex issue (Van de Vijver & Leung, 2009), but future studies could rely on different measures that might show up to display intercultural learning more accurately.

The challenges of virtual work on a global scale only cement the complexities of creating multicultural learning in a virtual teaming environment. Future work should use a longitudinal methodology to explore long-term changes in teaching strategies as well as increased mastery of subject area knowledge resulting from the integrated curriculum. The ultimate goal of this pedagogy is to create an integrated curriculum built on global processes and factors.

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Table 1: Pearson bilateral correlations and significance between teamwork items

	Mean	S.D.	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
T1 Initially, I expected that communication within this international team would be quite easy, as we all speak English and have access to information technologies and the internet.	3.32	1.14											
T2 Finally, communicating with the teammates abroad was more difficult than I thought.	3.69	1.35	.36***										
T3 Initially, I expected that our international team would work out a final presentation and report of high quality.	4.07	.88	.15	.08									
T4 Finally, the final results of our teamwork don't meet my expectations – are of lower quality than I expected.	3.09	1.41	.24*	.37***	-.02								
T5 I liked working in this international team.	3.36	1.27	.10	-.29**	.14	-.21*							
T6 I was frustrated by the international team.	3.04	1.37	-.04	.34***	-.08	.46***	-.35***						
T7 We had conflict in our team.	2.72	1.33	-.05	.34***	-.01	.22*	-.24*	.43***					
T8 In our team, there were “team leaders” on each side who communicated with the foreign team leader more frequently than the other team members did.	3.97	1.14	.04	.12	.14	.12	-.02	.10	.12				
T9 I (explicitly or implicitly) had the role of a team leader on “our” side and interacted more frequently with our international teammates than did other students from my country.	2.71	1.42	-.05	-.04	.17	.06	-.06	.02	.12	.30**			
T10 Our team had difficulties in working together at some point, but we overcame these difficulties.	3.44	1.13	-.17	.12	.01	-.01	.01	.09	.23*	.12	.12		
T11 In the end, our team worked together well.	3.70	1.14	-.26**	-.42***	.10	-.52***	.36***	-.45***	-.37***	-.03	-.09	-.03	
T12 I think I learned a lot as a result of the international teamwork.	3.78	1.03	-.09	-.16	.23*	-.27**	.48***	-.32***	-.18	-.01	.16	.11	.41***

Scale for T1 to T12: 5-point Likert scale, 1= I strongly disagree, 5 = I strongly agree

* p < 0.05 (bilateral), ** p < 0.005, *** p < 0.001 (bilateral),

Table 2: Communication modes and teamwork: means, standard deviation and bilateral

Pearson correlations

	Mean	S.D.	C1	C2	C3	T4 (poor outcomes)	T6 (frus- tration)	T11 (team funcio- ning)	T12 (learning)
C1 During the international teamwork, I was in contact with my foreign teammates...	3.56	.90				-.36***	-.30**	.24*	.22
C2 I used emails to communicate with my teammates...	4.30	.78	.37***			-.17	-.11	.13	.10
C3 We used Facebook or Google docs or a Yahoo group where we shared documents...	3.59	1.34	.17	.09		-.15	-.22*	.14	.26***
C4 I used voicemail like Skype or the phone to communicate with my foreign teammates...	2.31	1.37	.19*	.15	-.01	-.06	-.26**	.06	.01

Scale for C1 to C4: 1= Never, 2 = Rarely, 3 = Sometimes, 4 = Frequently, 5 = very frequently

* p < 0.05 (bilateral), ** p < 0.005, *** p < 0.001 (bilateral),

Table 3: DMIS Reliability, Mean scores, Standard Deviation and Bivariate Pearson Correlations with teamwork processes and outcomes and former international experience

DMIS Stages	Cron- bach Alpha	Post- team Mean	S.D.	T4 (poor out- comes)	T6 (frus- tration)	T11 (team funcio- ning)	T12 (lear- ning)	Foreign language prof.y	Travel expe- rience	Inter- action	Life abroad
Denial	.67	1.90	.78	-.072	.09	.19*	.03	-.04	-.15	.08	-.15
Minimization	.63	3.5	.73	-.22*	-.15	.29**	.17	-.22*	-.12	.10	-.04
Acceptance	.56	3.86	.61	-.16	-.02	.17	.22*	-.06	.04	.16	.04
Adaptation	.52	3.61	.72	-.23*	-.22*	.18	.08	.04	.17	.26**	.17
Integration	.59	3.41	.76	-.13	-.30 ***	.17	.14	.27**	.32***	.46***	.35***
T6								-.14	-.03	-.20*	-.16
T11								-.14	-.15	.26**	.04
T12								-.10	-.16	.31***	.03

* p < 0.05 (bilateral), ** p < 0.005, *** p < 0.001 (bilateral)