

REVIEW

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Working with multicultural virtual teams: critical factors for facilitation, satisfaction and success

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Abstract

Information and communication technologies provide the necessary infrastructure for individuals from different cultures and locations to work and learn collaboratively. However the inner workings of such collaboration still keeps its mystery. In this literature review, the issues of how collaborative work comes into being and develops in multicultural virtual teams, the ways to facilitate them and what makes the work in such a team satisfactory and successful are explored. More specifically, how communication works among team members who come from different cultural backgrounds in a context lacking social cues; how potential conflicts due to different cultural understandings on very basic issues are resolved; or how certain notions such as trust is formed, maintained, *etc.* In pursuit of exploring these concerns, various articles obtained from the conducted literature survey were examined to discover recurring issues. Based on the findings and interpretations from the literature, this paper provides strategies to overcome and leverage similarities and differences inherent in team members. The findings of this literature review are especially important for those people who are planning to organize activities, which involve collaborative multicultural virtual teams.

Keywords: Collaboration; Computer supported collaborative work (CSCW); Computer mediated communication (CMC); Cross-cultural issues; Distributed teams; Virtual Teams

Introduction

Contrary to Taylor's "division of labor" philosophy that characterized the industrial age, today, organizations utilize a more recent philosophy that is rooted in the information age, based on teamwork at different local, national, regional and even international environments. Along with this dramatic change, the need for communication between people also increased exponentially. This need gave thrust to spreading of Information and Communications Technologies (ICT), as well as giving birth to new forms of media, which made collaboration possible and increasingly free from any temporal and spatial constraints (Queralt, 1996). More specifically, a host of synchronous and asynchronous web-based tools are put to use to support and facilitate collaboration among distributed teams and individuals around the globe, who participate in "virtual" communities or organizations for learning and work, which began to flourish exponentially (Riel, 1993; Travica, 1997; Muethel & Hoegl, 2010). Such communities, in turn, offer collaborative opportunities in continuous and new ways that nurture

collaboration and knowledge exchange among members of the community (Thach & Murphy 1994; Webb & Palincsar 1996; Davidson & Goldberg 2009).

As for virtual teams (VTs), literature offers different definitions. Members of such teams may be formed by people from different departments, organizations, countries and cultures (Pauleen & Yoong, 2001). However, the common denominator across these different definitions is the recognition that VT members live, work or study in different geographic areas and time zones, and that they generally use information and communication tools (Hofstede, et al., 1997; Pauleen & Yoong, 2001; Jarvenpaa & Leidner, 1998; Huang et al. 2010).

Moreover, since many individuals, groups, and organizations from different countries prefer using such VTs to conduct their learning and work, team performance may be directly (or indirectly) affected by the cultural contexts that team members bring in to the instructional or performance settings. Within this context of multiple cultures, the use of advanced ICT for collaborative work offers the potential for effective performance and the promotion of multicultural understanding among citizens of different nations (Cagiltay et al. 2001). Hence, this study focuses on the factors and issues impacting the success of collaboratively working multicultural VTs.

According to Hofstede et al. (1997), a multicultural team is a team whose members have different cultural backgrounds. Most evident in that they have spent their formative years in different countries and thus have learned different values, demeanors, and languages (Humbrick et al., 1998). When “virtual” is added to such “multicultural teams,” it usually signifies that the members of such a “virtual, multicultural team” may not have the advantage of face-to-face interaction and communication. Instead, they rely solely upon an assortment of computer-supported cooperative learning and work tools, of which the most widely and economically applied, are e-mail, chat rooms, and discussion lists. Thus, given the current state of technology, VTs composed of multicultural or multinational members can technically function well despite their dispersion across the globe.

Hofstede (1980) wrote that the survival of mankind will depend to a large extent on the ability of people who think differently to act together. International collaboration presupposes some understanding of how others’ thinking differs from ours. This type of research is especially important in determining how interpersonal relations work in such environments in order to overcome the potential effects of intergroup differences and create satisfying and productive partnerships among individuals separated by cultural differences and geographical distances. Therefore, this paper intends to contribute to our knowledge of collaborative multicultural teamwork in virtual environments.

Review

To find out the main factors that impact the success of collaborative multicultural teamwork in virtual environments; an extensive literature search is conducted with keywords such as multicultural, virtual teams, collaboration, cross-cultural, ICT, computer mediated communication. This endeavor resulted in hundreds of journal articles and conference proceedings. A second examination of the abstracts led to an elimination of irrelevant journal articles and conference proceedings. The remaining articles are

examined in detail to find out the recurring issues and critical factors impacting success of VTs.

The findings from our literature survey address some of the key recurring issues which are various dimensions of culture, technology use (choice of the communication medium), different interaction patterns among team members of various cultures and the effect of cultural factors (such as individualism vs. collectivism), communication behaviors (reaching consensus, flaming, *etc.*), change of relations in time, trust, problem solving approaches, and conflict resolution on the performance of such a team.

Culture

Geertz (1973) defined culture as “a system of inherited conceptions expressed in symbolic forms by means of which [wo]men communicate, perpetuate and develop their knowledge about and attitudes toward life” (p. 89). Contrary to early studies assuming biology serves as a foundation for the cause of human behavior, Bruner (1990) argues instead that culture and the quest for meaning within culture are the actual causes of human action. Furthermore, he proposes that it is culture, not biology, that shapes human life and the human mind.

Hofstede (1980) specified four main dimensions on which national cultures differ: power distance, uncertainty avoidance, individualism-collectivism, and masculinity-femininity (see Table 1). Among these, however, the individualism-collectivism dimension comes into prominence as the most researched element of the model.

Critical factors impacting the success of VTs

There are many potential problematic areas within cross-cultural communication and hence the collaboration between VTs. Depending on the task or interaction, a value- or practice-based cultural difference could potentially cause negative, positive or neutral results. Tan et al. (1995) cites an example: the failure of U.S. corporations’ attempt to export management-by-objectives (a popular management technique in the 1960s) to

Table 1 Hofstede’s four main dimensions on which country cultures differ

Dimension	Definition
Power distance (how people respond to power and authority)	In high-power-distance cultures people have greater respect for authority - bosses, managers or teachers tend to be more paternalistic or autocratic. In low-power-distance cultures, subordinates are more likely to challenge bosses, managers or teachers.
Uncertainty avoidance (people’s reaction to unknown situations)	Some cultures are low in uncertainty avoidance, <i>i.e.</i> , they like to take risks, take individual initiative, and enjoy conflict. Whereas some cultures are high in uncertainty avoidance, <i>i.e.</i> , do not like conflict, but pursue group harmony; people within these organizations need clear rules, procedures, and clearly defined job responsibilities.
Individualism-Collectivism (function primarily as a group member or as an individual)	In an individualistic culture, people are expected to look out for themselves. In a collectivistic culture individuals develop strong personal and protective ties. They provide loyalty to the group without questioning.
Masculinity-Femininity	Some cultures are rated high on masculine dimensions (males are expected to be “in-charge”). In contrast, some others have a stronger feminine dimension, which means that roles are more fluid between males and females.

Germany and France is found to be mainly because of cultural differences. On a similar note, Robinson (1997) presents a case that reveals the cultural difference between Turkish and Western managers as well as differences in their perception. Observing the joint venture of a German-American company with a Turkish company, he found that conflicts began to appear, because the culture of Turkish company managers showed low individualism but a higher power distance and higher uncertainty avoidance level than the German-American company managers. Thus, cultures' relative positions to each other in Hofstede's (1980) four dimensions could be a good indicator for potential conflict points in a cross-cultural interaction.

According to Brandon and Hollingshead (1999), "several researchers have argued that the fusion of collaborative learning and CMC technologies is mutually beneficial, since collaborative learning helps structure the online environment and CMC technology removes many of the barriers to collaborative learning" (p. 110), by adding "emphasis on access to resources" and by promoting "the extent of collaboration," through, for instance, "the use of discussion boards" (Romiszowski & Mason 2004, p.400). Yet, researchers also report some negative aspects as well as inherent dangers of CMC, such as isolation, conflict, the slow and frustrating nature of online communication, the distracting elements of computers, and the lack of various social cues. As for a multicultural group environment, each group member adds their own unique experiences and talents to the team, which is a powerful way to conduct the work. When each individual uses their intercultural difference for synergy, rather than letting it to become a cause for divisiveness, it strengthens the resources of the team (Harris & Moran, 1996). Moreover, let alone the designated negative aspects of CMC, the role of cultural differences among VT members makes the collaborative work processes more complex. A large body of studies has examined this complex interrelationship (Powell et al. 2004; Connaughton & Shuffler 2007; Niederman & Tan, 2011, April).

Our literature review shows that communication, language, media, dimensions of culture and conflict have significant impact on multicultural teamwork, and problems in multicultural teams generally occur due to one or more of these factors, which are explored in detail.

Communication

A large body of literature reports that cultural differences create difficulties to effective communication among VT members (Kayworth & Leidner, 2000; Sarker & Sahay, 2002; Van Ryssen & Hayes Godar 2000). CMC itself limits the level of communication due to lack of prosodic features and paralinguistic aspects such as intonation, stress, pitch, which can be used for emphasis and contrast in verbal communication as well as the lack of non-verbal social cues, such as gestures, facial expressions and body language that are "readily appreciated in face-to-face discussions" (Kim, et al., 2007, p.338; Vignovic & Thompson, 2010).

Koschmann, et al. (1994) state that it would be undesirable to use CMC as the only means of communication in a collaborative task. There is a consensus on the importance of effective communication for the collaborative development of shared meaning and, consequently, for the success of VTs (Brandon & Hollingshead, 1999; Pauleen & Yoong 2001, 2000; Romiszowski & Mason 2004; Muethel & Hoegl, 2010;

Niederman & Tan 2011, April; Berry 2012). According to Brandon and Hollingshead (1999), VTs spend a lot of time in communication and the amount of communication in an online environment is more than in face-to-face groups. Reid, et al. (1997) found that computer mediated groups reported greater difficulty communicating ideas than face-to-face groups and took longer to reach decisions. However, Jonassen and Kwon (2001) demonstrated that the patterns of reasoning were more complex and the decisions were perceived to be better due to deep and reflective thinking provided by such elongated communication time than those in face-to-face settings.

Beside these factors, George et al. (1998) report that “the effects of cultural differences on people’s cognitions and attitudes have been receiving increased attention: affect - the feelings that people experience, their moods and emotions - and motivation play an important role in cross-cultural settings” (p. 750). People from different cultures express their emotions differently. The motivation process - how it’s controlled, who it appeals to, how to recognize it, and how to reward or punish employee behavior - is directly related to cultural values (Elashmawi & Harris, 1993). Since motivational processes, tools, and values reflect specific cultures directly or indirectly, people from different cultural backgrounds may respond to different motivational factors (Lucas et al., 2000; Colins, 1998; Wilson, 2001; Paletz et al. 2014).

Language

Language, our main communication tool, is perhaps one of the most important barriers and a fundamental cause of problems in cross-cultural communication. It is important since culture including norms and code of social interactions within the community is acquired through language (Wertsch, 1991), along with the structure of social meanings and relationships (Resnick, 1991) that are fundamental for future social interactions. In addition to language, space, time, body gestures and writing styles have different meanings in each culture. Some cultures like to keep a distance or a wider personal space during face-to-face communication, whereas for others bodily contact is a very important part of interaction. Different cultures define time differently and they give different values to the past, present and future. Also, the vocabulary, grammar and meaning of time vary widely around the world (Elashmawi & Harris, 1993).

Robichaux and Cooper (1998) concluded that “cultural differences in terms of language affect the interaction of personal abilities and the supporting technologies, which results in a differentiation of behavioral skills and leads to differences in the ease with which participation in communication can occur” (p. 297). Similarly, Nurmi, et al. (2009) pointed out language as an important factor affecting high performance teamwork within such multicultural VTs especially in corporate environments. According to Pincas (2001), the use of English as a second language and the lack of paralinguistic cues in cross-cultural electronic communication cause many difficulties, *e.g.* using conventions of mother tongue, politeness, modes of emphasis, ways of referring back to previous messages, use of netiquette rules, and the perception of relevance, which is reported as the most difficult aspect of cross-cultural discourse. For example, irrelevant messages (phrases, idioms, sayings) may easily be interpreted as offensive statements by non-native speakers (Paletz et al. 2014; Tenzer et al. 2014).

Media

For collaboratively working multicultural teams, the communication medium itself is a problem. The way that media are used by different cultures may differ. According to Straub et al. (1997), there is reason to believe that connections do exist between cultures and the use of certain ICTs. Ho and others argue (cited in Straub et al., 1997) that low individualism (collectivistic culture) possibly predisposes a culture against CMCs, because these media mute the group effect. Kumar and Bjorn-Andersen (1990) state that information systems “have built-in value biases reflecting the value priorities of the culture in which they are developed” (p. 535). Therefore, there may be slow acceptance rates or different usage preferences for certain kinds of technology among different cultures and the consequence could be as fatal as the failure of the project. For example, some cultures may process information differently (*e.g.* verbal/analytic or visual/holistic, linear or concurrent), give higher or lower priority to different kinds of information, and have different degrees of satisfaction with various information systems (Wilson, 2001). On the other hand, Rice et al. (1998) found that, although there was evidence for some cultural differences in perceptions of media, it was not strong or consistent, which is in line with Greenfield and Subrahmanyam’ (2003) study, where they showed that communicators could invent ways to work out such problems such as using a distinctive writing style.

When multicultural organizations adopt new media, their members may experience problems in trying to understand how to best use new media in the context of their existing cultural norms for media use (Rice et al. 1998). Poole and DeSanctis, in Burke et al. (1999), theorize that in such settings, rather than adapting user behaviors to specific characteristics or limitations of the medium, users may adapt the medium to suit their requirements. According to Shachaf and Hara (2007), if the team members are not socially close to each other, informal channels for information flow (*e.g.* chat) are excluded from use. Thus, social proximity and cultural diversity play important roles in media selection.

In addition to the issues presented above, technical characteristics of media may also cause problems. Shachaf and Hara (2007) found that team members’ ability to use available media channels for specific tasks set boundaries on the choice of media.

Dimensions of culture

In several studies, researchers explored the relationship between CMC and the influence of three dimensions from Hofstede’s model including uncertainty avoidance, individualism-collectivism and power distance. Straub et al. (1997) studied the uncertainty dimension and found that countries that are located on the strong uncertainty end (*i.e.* fear of ambiguous situations or avoidance of risks) use electronic media less often since these media are not as well suited to uncertainty reduction as face-to-face and other media-rich channels.

Tan, et al. (1998) studied the effect of majority influence in CMC among individualistic and collectivistic cultures; where they found that there is a relationship between the impact of CMC on majority influence and national culture. Since CMC replaces face-to-face and verbal communication, it diminishes majority influence in an individualistic culture, but the researchers did not observe the same change in a collectivistic culture.

They advised one way to overcome this problem in a collectivistic culture, which is to allow people to use CMC with content anonymity. They further noted that content anonymity allows people to contribute ideas more freely, though it is not clear how this may affect majority influence in a collectivistic culture. Connaughton and Shuffler (2007) reported two different studies which indicated contradictory results. In one case, the participants from individualistic culture shared more knowledge than the collectivistic group, whereas, in another case, a collectivistic orientation helped to enhance collaboration between groups.

Regarding power distance, Robichaux and Cooper (1998) report that in cultures in which managers and workers are separated by large power distance, the leveling effect of CMC-based group support systems is significant. However, in another study, Straub, et al. (1997) found no leveling effect of CMC on power distance; further, they found that such a leveling effect of CMC was not viewed as desirable in high-power distance cultures.

Conflict

People working together, either in the same location or in distributed environments, can expect to experience differences in perceptions, opinions, communication, interpersonal style, and values. The reason for these differences is that the values, norms and the code for social interactions in our own culture are programmed into our minds to process the behavior of others according to our own culture's belief and knowledge structures. When two people with different perception and value systems meet, it is almost inevitable that each party misunderstands the behavior and motives of the other (Robinson, 1997). The likelihood of experiencing cultural clashes is very high, especially when a team is formed of members from a variety of cultures, since cultural meanings may influence individuals' tolerance for a situation, which might be perceived as a conflict or interpreted as a threat (Paletz et al. 2014). Robinson states, "One of the major hurdles in the resolution of intercultural conflicts is the fact that the parties involved tend very often to misinterpret each other's intentions" (p. 7). Hofstede et al. (1997) define these problems as "unintended conflicts." Problems may occur with each contradiction or confrontation between differing values, beliefs and assumptions. They are hard to solve because people are often not aware of their own values any more than they are aware of the values of others, so they do not understand each other's cultures well enough to resolve conflicts.

Hofstede, et al. (1997) listed two types of conflict during group decision making in a multicultural team: cognitive and affective conflicts. "Cognitive conflict is about the content of the decision, whereas affective conflict is about interpersonal feelings. Cognitive conflict improves the quality of a decision. Affective conflict, in contrast, has a detrimental effect on decision acceptance" (p. 5). Cognitive conflict becomes destructive only when it gets personalized resulting in negative feelings and private agendas that detract from the common purpose and goals of the team, which further ends in frustration and loss of trust and commitment within the team (Williams, 2008; de Wit et al. 2012; Tenzer et al. 2014). As for affective conflict, Kilker (1999) notes that the research shows the importance of the role those stereotypes play in it because they oversimplify, are difficult to adapt to new situations, and become exaggerated when social

tensions arise between groups. In multicultural teamwork, cultural differences may lead to a greater conflict. According to Staples and Zhao (2006), especially diverse individualism/collectivism values cause conflict in teamwork; “some people will be willing to cooperate and sacrifice for the overall team, and some will not” (p.392). Because of their cultural background, team members may have different values and expectations from the other members in terms of communication and interaction patterns.

Facilitation of multicultural VTs

Dealing with all these problems of VTs requires a significant amount of group facilitation. However, Pauleen and Yoong (2001) found that there is not much research about different aspects of developing effective strategies for VT facilitation. Cagiltay et al. (2001) completed a multicultural project that focused on the design of instructional content and processes to facilitate collaboration between teams of school children from different countries working on a project together within a virtual environment. The researchers found that, compared to face-to-face projects, the facilitation of VTs is an extremely difficult task.

Suggestions for multicultural teams

A number of suggestions have been offered by researchers to help team members overcome the problems that can occur in multicultural communication. Followings are some of the major suggestions that should be taken into consideration by people who work with or within multicultural teams.

Accepting cultural differences

One major problem facing multicultural CMC teams is that team members are not generally aware of their own cultural values. Pauleen and Yoong (2001) advise that “cultural tolerance and empathy are basic conditions for communicative openness” (p. 215) and that cross-cultural teams need “more intensive, culturally appropriate, relationship-building strategies using richer communication channels” (p. 217). To minimize negative effects and to communicate successfully with a person coming from a culture that is different from ours, whether with a person from a specific company or from a different country, we should try to become more culturally intelligent and open to cultural diversity, *i.e.* identify other team members’ cultural values and understand how they differ from ours to be able to deal effectively in culturally diverse settings (Robey et al. 2000; Sarker & Sahay, 2002; Elashmawi & Harris, 1993; Harris & Moran, 1996; Williams, 2008; Tirmizi, 2008; Lisak & Erez, 2015). As suggested by Connaughton, and Shuffler (2007), if team members “learn the cultural logic of others’ divergent beliefs” (p.396), then they work effectively. At the same time, in dealing with differences in culture, we must also remember that all cultures and all human beings usually have much more in common than not. Respect for the differences in our cultures is a critical element in building a cyberspace. Since no one can force his/her values on others, “acceptance and tolerance” become the most important terms for intercultural constructive competence (Robinson, 1997; Williams, 2008; de Wit et al. 2012).

As a conclusion, a powerful strategy could be providing a cultural orientation session at the beginning and letting the team members get to know each other. Sharing some

real life cases or role playing to improve empathy can be effectively used to inform the team members and to increase their awareness of potential problems.

Motivation

Motivation is another important aspect of multicultural communication. Something that motivates someone within their culture is not necessarily the same with what motivates another person from another culture. For example, some cultures have a tendency to study and learn in groups rather than working alone (Wilson, 2001). Lucas, et al. (2000) explain “in collectivist cultures, social behavior may be motivated by norms and responsibilities rather than by the desire for fun and enjoyment” (p. 458). Similarly, Wilson (2001) states that in collectivistic cultures the main motivation for learning is the obligation to the family/community, whereas in individualistic cultures motivation stems more from personal satisfaction and competition between individuals. Recognizing these differences is essential when working in a multicultural setting. Han et al. (2001) conclude that because motivation is one of the major challenges in the design of a collaborative environment, motivational theories must be taken into consideration.

Geister et al. (2006) list four major elements of motivation in VT performance: valence, instrumentality, self-efficacy, trust (system/person). Similar to Muethel and Hoegl (2010), they suggest that in order to clarify value (valence), a clear definition of team goals and transparency in goal setting are necessary. Otherwise, team members may be demotivated from the very beginning of the project. For instrumentality (which is concerned with establishing a sense of an individual’s role in the team) they advise “personal efforts for the team outcome can be increased by framing the task assignment clearly and transparently, giving feedback for achieving goals, and communicating relationships between tasks and team member contributions” (p. 461). Hardin et al. (2007) posit that individualistic and collectivistic cultures show different characteristics in regard to self-efficacy. Team members from individualistic cultures have higher self-efficacy beliefs than team members from collectivist cultures. Despite this difference, Geister et al. (2006) suggest that self-efficacy can be strengthened by feedback on positive results and training. Trust, the final element of motivation, deals not only with team members, but also with the ICT system. Geister et al. (2006) note that electronic communication may lead to decreased trust and less cooperative behavior in teams. They suggest “enabling face-to-face meetings (e.g., kick-off events), encouraging informal communication between group members and a constructive conflict management seem to enhance VT trust” (p. 461).

Facilitation within VTs and the facilitators’ role

Collaboration among VT members does not develop automatically. According to Sarker and Sahay (2003), “appropriate triggering mechanisms” are needed to attain the collaborative state. A common element cited by several different cross-cultural researchers is the critical role of the manager, facilitator, or the coach of the multicultural team (Williams, et al. 2001; Robinson, 1997; Harris & Moran, 1996; Berge, 1995; McLoughlin, 1999; Williams, 2008). Williams, et al. (2001) found that facilitation in online cross-cultural environments is a very challenging task. They list some of the major challenges as

questioning, fostering participation, addressing interpersonal and group dynamics, identifying facilitator expectations and uncovering anxieties.

Rosen et al. (2006) suggest that as the use of VTs increases, team facilitation requires a special set of skills that team leaders may develop through appropriate training. Training should address: face-to-face team-building session prior to VT launch, mastering VT technology, communications skills and team management.

VT leaders also need to provide timely and constructive feedback to teams. Geister et al. (2006) report that team process feedback has a positive effect on motivation, satisfaction, and performance in VTs. It is especially relevant for relatively less motivated team members. Therefore, facilitators must follow team members and team progress closely (Sivunen, 2006).

Managing communication

In a collaborative virtual work environment, communication and interaction are the key factors for success. But, in cross-cultural contexts, it is not always correct to assume that more communication and interaction is better than less. Moreover, Sarker and Sahay (2003) note that the distinction between communication and collaboration is often left unclear. The frequency and complexity of team communication has to be carefully managed by VT facilitators (Collins & Remmers, 1997; Pauleen & Yoong, 2001; Lilian, 2014; Lisak & Erez, 2015). Pauleen and Yoong (2001) report that a member of a VT must first establish personal relationships with the rest of the team members. In order to do this, they suggest using the telephone because it helps to make “groundbreaking types of conversations” (p. 210), and people can get paralinguistic clues from the others. To create a successful collaboration environment; team structure, communication patterns and modalities have to be effective and compatible with each other (Sarker & Sahay, 2003).

Language is perhaps the most important element in cross-cultural communication (Tenzer et al. 2014). Whenever communication and interaction are involved, team members have to be particularly sensitive to cultural differences in terms of communication styles - *i.e.* who should initiate comments or questions, who should moderate, the extent to which disagreement or debate is expected, who should decide to terminate a line of communication, which level of formality considered appropriate in interaction between the communicating parties, *etc.* (Gudykunst et al. 1996; Pauleen & Yoong, 2001). Moreover, in such a multicultural collaborative environment, English is often used as the communication language and this may cause communication difficulties within teams (Pincas, 2001; Staples & Zhao, 2006). If English is not the native language of one group, other members should be informed about the possible limitations of the situation. Finally, as a rule of thumb, teams should avoid using slang or other culture specific terms.

Conflict resolution strategies

The lack of social cues or emotions (facial expressions, body language, *etc.*) makes electronic communication different than the communication in a face-to-face environment. Since social norms and standards disappear in virtual environments, such atmosphere can lead users into unintended conflicts (Vignovic & Thompson, 2010).

Differences in conflict styles between cultures have a significant role on the performance of teams in online environments (Kayworth & Leinder, 2002; Walsh et al. 2003; Yoo & Alavi, 2004). Being prepared for conflicting situations and having some method to deal with them appropriately is the key factor in assuring better solutions, enhanced understanding and trust, improved working relations and cultivated creative thinking (Kollock & Smith, 1996; Williams, 2008; Leung et al. 2011; Lisak & Erez, 2015). In case of a problem or conflict, the facilitator/coach needs to know how to apply constructive conflict management strategies. For this purpose, the facilitator/coach should clarify and address problems, give clear instructions, focus on the issues and work toward solutions. While working to solve problems they should definitely avoid “taking sides.” In order to decrease the chance of conflicting situations in electronic communication, Pincas (2001) suggests that “attention should be given to netiquette rules of deference, politeness in acknowledging others’ messages, modes of emphasis, and ways of referring back to previous messages” (p. 46).

Use of appropriate media

As stated before, information and communication technologies (ICT) make international collaboration possible. However, ICT by itself may become one of the sources of problems for multicultural teams. On the selection and use of appropriate ICT, the team facilitators have to be very careful and take the characteristics of the team into consideration. Staples and Zhao (2006) suggest that designers should take the homogeneity/diversity characteristics of teams into consideration.

Designers should determine what “the lowest common denominator” will be in terms of technologies that will be needed in order for the project to succeed. Powell et al. (2004) characterize this issue as the “task-technology-structure fit.” According to these researchers, suitable technologies have to be carefully examined in order to pick the best one(s) for the needs of a vVT.

Culturally sensitive interface design

Since multicultural team members meet in cyberspace, they first encounter with the physical device (the computer), then with the user-interface. Therefore, international user-interface design guidelines and core functionalities should be followed (Collins, 1999; Galdo & Nielsen, 1996; Fernandes, 1995; Aykin, 2007). If the actual users are not involved in the process of designing and developing the interface, they should contact the designers and bring these cultural issues to their attention. McLoughlin (1999) says that culturally sensitive and appropriate materials can be produced only if “designers are aware of the socio-cultural background and learning styles of the learners, and if an appropriate instructional paradigm is applied to the process of development” (p. 241). For this purpose, designers of multicultural VT environments need to get team members’ feedback about the appropriateness of the interfaces and other electronic materials. This feedback collection process should not be postponed to the last moment, but instead should be a formative process that is spread throughout the development of such interfaces or materials. Following user-centered design methods, especially the participatory design approach, is the best development approach for creating these kinds of environments.

Establishing relationships between content and cross-cultural relevance

According to Pincas (2001), "Perhaps the most difficult aspect of cross-cultural discourse, whatever the medium, is in the perception of relevance" (p.46). If a multicultural team works on an educational project or a course, the facilitator or the instructor should carefully consider the content. For example, American English is different than other languages, in that keywords or phrases are usually found at the beginning of a paragraph. Wilson (2001) suggests that international learners need to become aware of this situation. If the content requires specific cognitive processing, designers must provide activities to teach and develop such abilities (Wilson, 2001). Moreover, after working with three international teams on a one-year project, Bichelmeyer et al. (2004) argue that when attempting to establish cross-cultural communication between students from multiple countries, designers should develop the content considering intercultural activities by using topics that students can relate to from their everyday lives.

Conclusion

Information and communication tools offer one of the most exciting and effective ways to teach people how to collaborate by connecting teams around the world. Collaborative learning and working is challenging when team members who are working together come from different nations with varied cultures, histories, and socio-political beliefs. Such an environment can only be productive if we are well prepared for potential problems and ready to take necessary actions in advance.

The recurring themes from the literature have shown that several factors affect the performance of multicultural VTs (see Table 2). Facilitators or managers have important responsibilities in the preparation of a healthy team work settings for VTs. They have to be knowledgeable about preparing teams for such a challenging situation. Team facilitators need skills and knowledge to help keep the team members on track, detect conflicting situations among team members, take necessary actions before it is too late and use appropriate technologies to work collaboratively. These are only some of the critical issues that were addressed in this paper.

There are some reflections in the literature on the educational impact of new technologies and two-way interaction between cultures; however, there has not been much systematic investigation into the dialectic of culture and new technologies. At this point, we cannot clearly identify and explore all of the issues related to culture in such virtual settings. There is no well-defined model that specifically investigates the problem of designing complex systems for multiple cultures. In order to find out the most important issues in creating and supporting multicultural teams that work collaboratively in a distance environment, there is a need for conceptual and empirical research on culture and its influence on computer-mediated collaboration among VTs (Wild, 1999; Pauleen & Yoong 2001; Connaughton & Shuffler, 2007; Vignovic & Thompson, 2010).

It seems apparent that the lack of research that targets cultural issues in collaborative working/learning environments is likely to have negative consequences for both team members and organizations/institutions in such collaboration. We posit that the socio-cultural aspects of a virtual world constitutes a more important and essential part of cyberspace than the technological aspects represented by computers, modems and

Table 2 Summary of suggestions for a successful multicultural VT

Suggestions for Facilitators	<p>Define the goals as clearly and transparent as possible at the very beginning</p> <p>Begin with face-to-face team-building session with intercultural activities by using topics that team members can relate to from their everyday lives prior to VT launch (kick offs) and then move into virtual context</p> <p>Establish personal relationships (For instance, make room for some personal one-on-one time with the team members to get to know them better and to establish better rapport, if possible) to</p> <p>Improve cultural intelligence (<i>i.e.</i> capability to deal and communicate effectively in culturally diverse settings, <i>e.g.</i> using more intensive, culturally appropriate, relationship-building strategies) and</p> <p>Increase openness to cultural diversity (<i>i.e.</i> the degree of receptivity to perceived dissimilarity, <i>e.g.</i> the cultural differences in terms of communication styles</p> <p>Build trust</p> <p>Foster creativity</p> <p>Use richer communication channels such as video, audio, <i>etc.</i> rather than lean communication channels such as text that lacks nonverbal cues (at least, at the beginning of the teamwork)</p> <p>Master VT technology</p> <p>Consider the content-communication-technology compatibility and effectiveness (<i>e.g.</i> use audio conference for discussing the milestones or critical work packages to avoid any misunderstanding about the task at hand rather than written communication while using e-mail to check the progress about an ongoing task).</p> <p>Improve the necessary team management skills such as checking the progress, questioning, fostering participation, managing conflict and anxiety <i>etc.</i></p> <p>In case of a problem or conflict,</p> <p>Avoid “taking sides.”</p> <p>Clarify and address problem,</p> <p>Give clear instructions,</p> <p>Focus on the issues and</p> <p>Work toward solutions.</p> <p>Give immediate, positive, informative and constructive feedback on results</p>
Suggestions for Team Members	<p>Identify other team members’ cultural values and understand how they differ from one’s own as well as the similarities</p> <p>Learn the cultural logic of others’ divergent beliefs</p> <p>Respect, accept and tolerate the differences</p> <p>Communicate utilizing the netiquette rules at all times while avoiding using slang or other culture specific terms</p>
Suggestions for Designers	<p>Follow user-centered design methods, especially the participatory design approach, which is the best development approach for creating a cyber-environment for VTs</p> <p>Be aware of the lack of social cues or emotions (facial expressions, body language, <i>etc.</i>), which makes electronic communication different than the communication in a face-to-face environment.</p> <p>Consider the content-technology compatibility</p>

wires - and yet the socio-cultural aspects receive far less attention. There are still many questions that need to be addressed by researchers who are focused on better understanding the issues that affect collaboration among multicultural VTs.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

KC, BB and GKA reviewed the literature. KC and BB drafted the initial manuscript. KC and GKA reviewed and revised the manuscript into its final shape. GKA conducted the final touch-ups for the final manuscript. All authors read and approved the final manuscript.

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