

# English Language Acquisition and Intercultural Learning in Computer Mediated Communication

Arash Dehghanian and Mehdi Azizi

**Abstract**—This paper first describes some definitions of CMC to determine what it is. Then technologies of communication through computer medium and instructional design was discussed. After the applications of CMC especially in language learning such as collaborative learning was described. There after the application of CMC in language acquisition and intercultural learning was compared. At last, a new idea for future working in this area has been suggested.

**Index Terms**—Authentic experiments, epistemic engagement, epistemic discourse, intercultural learning, computer – mediated communication.

## I. INTRODUCTION

CMC refers to computer mediated communication which has various definitions that has little differences, but they are in common in some features. Computer-mediated communication briefly refers to “those technologies used for communication where the computer plays a major part. It includes Newspapers, Chat rooms, E-mail, and computer-mediated conferencing. Often was abbreviated to CMC.” [1]. There exist more extended definitions of CMC that will illustrate comparatively later.

CMC has many uses such as Internet training, searching, education, government, commerce, communication, language. This paper goal is to comparatively illustrate the use of CMC in language acquisition and intercultural learning. We will focus on concepts such as epistemic discourse, computer-supported collaborative learning (CSCL), Distance learning, and so on.

Language acquisition is divided two sections. The first discusses authentic instructional experience and the process of epistemic engagement. This acquisition is facilitated by a shift in instruction from abstract exploration language to dynamic authentic experience. The second part reviews research on the use of computer-mediated communications (CMC) technologies for engaging epistemic engagement along with a way of matching the most appropriate technology with the intended discourse goal [2]. The use of CMC for language learning can develop not only language skills but also intercultural communicative competence, lifelong learning skills and digital literacy for becoming active participants of the information society.

## II. DEFINITIONS

There are some definitions of CMC that have a little difference from each other that some of them are described here. At first we begin with Dr. John December’s definition that he has been using it for several years: it is not meant to be definition; it had been used as a working statement to explore the dimensions of what computer-mediated communication is and how to approach its study: “Since I do research on internet-based CMC, this definition is oriented to that context; but I don’t mean to imply here that all CMC is internet-based. I believe that process context is the key themes in the study of computer-mediated communication.”[3]. With Dr. December’s definition Computer-Mediated Communication (CMC) is the process by which people create, exchange, and perceive information using network telecommunications systems (or non-networked computers) that facilitate encoding, transmitting, and decoding messages. Studies of CMC can view this process from a variety of interdisciplinary theoretical perspectives by focusing on some combination of people, technology, processes, or effects. Some of these perspectives include the social, cognitive/psychological, linguistic, cultural, technical, or political aspects; and/or draw on fields such as human communication rhetoric and composition, media studies, human-computer interaction, journalism, telecommunications, computer science, technical communication or information studies [3].

In the Wikipedia website the Computer-Mediated Communication (CMC) is defined as any communicative transaction that occurs through the use of two or more networked computers (e.g., instant messages, e-mails, chat rooms), it has also been applied to other forms of text-based interaction such as text messaging. Research on CMC focuses largely on social effects of different computer-supplied communication technologies. Many recent studies involve internet-based social networking supported by social software [4].

In general, CMC, is a process through that people can interact, exchange, perceive information, culture, thought, ideas, history, knowledge, mores and social issues with each other via computer medium networking by tools E-mails, Blogs, Wikis, Chat rooms, audio and video conferencing without considering various perspectives of CMC studies.

## III. HISTORY OF CMC IN EDUCATION

Digitized communication and networking in education started in the mid 80’s (e.g. Hiltz, 1988) and became popular

in the mid 90's, in particular through the World-Wide Web (WWW), email and forums. There is a difference between two major forms of online learning. The earlier type, based on either Computer Based Training (CBT) or Computer Based Learning (CBL), focused on the interaction between the student and computer drills plus tutorials on one hand or micro-worlds and simulation on the other. Both can be delivered today over the WWW. Today the prevailing paradigm in the regular school system is Computer Mediated Communication (CMC), where the primary form of interaction is between students and instructors, mediated by the computer. CBT/CBL usually means individualized (self-study) learning, while CMC involves teacher/tutor facilitation and requires scenarization of flexible learning activities. In addition, modern ICT provides education with tools for sustaining learning communities and associated knowledge management tasks. It also provides tools for student and curriculum management. CMC plays of course an important role in full-time distance teaching. While most quality offers still rely on paper, video and occasional CBT/CBL materials, there is an increased use of e-tutoring through forums, chat rooms, video-conferencing etc. Courses addressed to smaller groups frequently use "blended" or hybrid designs that mix presence courses (usually in the bringing and at the end of a model) with distance activities and use various pedagogical styles (e.g. drill and practice, exercises, projects etc).

#### IV. EDUCATION TECHNOLOGY

Education technology can be considered either as a design science or as a collection of different research interests addressing fundamental issues of learning, teaching and social organization. There are few features that most researchers and practitioners might agree:

- 1) Use of technology is principled: technology means the systematic application of scientific knowledge to practical tasks. Therefore education technology is based on theoretical knowledge drawn from different disciplines (communication, education, psychology, sociology, philosophy, artificial intelligence, computer science, etc.) plus experiential knowledge drawn from educational practice (Descryver)
- 2) Education technology aims to improve education. Technology should facilitate learning processes and increase performance of the education system(s) as it regards to effectiveness and/or efficiency. [5]

##### A. Goals of Education Technology

Education technology research always had an ambitious agenda. Sometimes it only aims at increased efficiency or effectiveness of current practice, but frequently it aims at pedagogical change. Technology provides us with powerful tools to try out different designs, so that instead of theories of education, we may begin to develop a science of education. But it cannot be an analytic science like physics or psychology; rather it must be a design science more like aeronautics or artificial intelligence (Collins, 1992) [5].

#### V. EDUCATIONAL TECHNOLOGIES

Educational technologies are technologies that are used in education. Basque and Lungren-Cayrol (2003) found and analyzed 24 different typologies of ICT usage in schools and proposed a "meta-typology" with three categories [6]:

- 1) Typologies centered on the teaching/learning act
- 2) Typologies centered on the school and educational actors
- 3) Typologies centered on the learner

#### VI. CMC USE IN LANGUAGE LEARNING AND INTERCULTURAL INTERACTION

First we will discuss about language acquisition which is divided two sections. The first section discusses authentic instructional experience and the process of epistemic engagement. Students who study a language are better equipped to encounter and to interact with other peoples by being sensitive to the cultural and social mores of this society. The second part reviews research on the use of computer-mediated communication (CMC) technologies for engaging epistemic engagement along with a way of matching the most appropriate technology with the intended discourse goal.

Epistemic engagement is a technique which is dependent on using computer-mediated technologies to effect teacher-student and student-student interaction in authentic experiences. The idea is that "the learner engages in questioning, makes connections, draws inferences and validates learning" (Larremendy-Joerns and Leinhardt, 2006, p.590) in an authentic context. [2]

Now what is authentic experience? Authentic experience is an instructional assignment that has intrinsic relevance. Any authentic instructional activities must possess internal coherence and build on prior assignments also can be naturalistic and have external coherence to a student's real world contexts or problems. Authentic assignments require students to not simply react but to engage the content. Authentic experience encourages the students to cognitively engage the content by actively trying to make sense and to integrate the experience. Epistemic engagement as a form of instructional delivery takes on "the vision of knowledge and learning as practices both within the structure of a domain and within a disciplinary community" (Larremendy-Joerns and Leinhardt, 2006, p.590). The process to realize this vision is through discourse [2].

Next, epistemic discourse is collaborative discourse which student and teacher or student and student engage in an interaction that leads them to make meaning of the content and to incorporate it into their cognitive repertoire. An essential mechanism in the process of epistemic discourse is reflection which typically leads to a process of self-explanation that Ploetzner, Dillenbourg, Preier, and Traum (1999) define as self-explanation, which is "an attempt to understand something (e.g. instructional material) an individual might try to explain it to him/herself. Reflection, discernment, and self-explanation are an individual's attempt to create meaning through the filter of their private interior language in an attempt to integrate new experience into prior

knowledge.

Through the process of reflection, interaction and dissemination, the student engages the content in order to incorporate it into their cognitive repertoire. This discourse is epistemic. Therefore, the goal of instruction is to create authentic activities that require the use of epistemic discourse. The anywhere-anytime flexibility of CMC has been cited as a major factor in creating authentic assignments in order to encourage and sustain epistemic activities in the classroom.

A major hallmark of CMC is in its ability to remove the constraints of time and place that result in its anywhere-anytime flexibility. Individuals can exchange messages to one another privately and also post messages to public bulletin boards where anyone can read them. Hence, CMC technologies provide users to engage in public and private exchanges and interactions. For example in a chat room while one can carry on private chat can also continuing to engage the larger group.

Computer-mediated communication appears to provide instructors the opportunity to design epistemic engagement within authentic contexts. Students reflect real problems with opportunity to integrate this new experience through engagement with their peers. Successful use of CMC for epistemic engagement in authentic contexts requires careful design of learning activity while choosing the most appropriate software as delivery technology. There are numerous applications of CMC, each with different functional and social characteristics.

The goal of epistemic engagement is that students reflect, discuss and disseminate their understandings of an instructional activity in an authentic context. In order to maximize the epistemic engagement, both the discourse task and the delivery technology should be matched.

Researchers studied the effect of e-mail as a tool on 12 classrooms in 10 elementary schools (Van der Meij, de Vries, Boersm et al. 2005). What they found was that the students need to compensate for the lack of interactional coherence by creating what they named meta-tags. "Meta-tags resemble the explicit linguistic means used to fortify the bond between messages, only these tags do so within a message. Meta-tags thus strengthen the internal coherence of an e-mail." (Van der Meij, de Vries, Boersm et al., 2005, p.422). They noted that "E-mail conversations can suffer from a lack of simultaneous feedback, reduced audio-visual cues and deficient turn-taking." (p. 418).

The results of the study by Van der Meij et al., supports the idea that there is a task to technology fit. Email typically creates a one-on-one, private asynchronous exchange and is a better for creating a reflective discourse. Similarly, another study explored the use of a blog as a system for collaborative writing. Krause conducted a study using a graduate writing class. For the study he created a "collaboratively written blog space was a small part of the class. The blog was useful for individual short writing pieces but failed as forum for conversational exchange. From this study Krause (2004) concluded that blogs or similar web applications such as "other electronic writing tools that foster discussion and interactive writing, particularly e-mail lists commonly known as "listservs" ("blogs as publishing space") would have been matched.

The research shows that two design elements need to be considered in order to create a successful epistemic engagement. First, the instructional outcome must be clearly identified. Secondly it is necessary to match the intended discourse with the most appropriate and available software.

The anywhere-anytime flexibility of CMC is the primary component in creating epistemic activities in the classroom. By clear understanding of intended learning outcomes in conjunction with what students know prior instructors can design appropriate and authentic learning activities. Choosing the most appropriate delivery technologies is based on understanding the intended discourse goals.

A starting point for the creation of authentic assignments is an understanding of the intrinsic qualities and the naturalistic intent of the task. The task builds recursively on previous assignments as well as emulating the real world problems and context. To achieve this goal, the instructor needs to create authentic assignments that simulate the need to engage in epistemic discourse that is natural result of using language to learn.

Here we discuss about how to choose the best technology for intended learning goal. The choice of technology is done not by design but through convention or availability of the particular technology (see Van der Meij et al., 2005). Taxonomy of choice is built on the ability of software for storage as it intersects with the social characteristics of exchange.

The first step of choosing software begins with the archival nature of CMC. Persistence allows for the retrieval, revision and revival of previous thinking or interaction. For example the dialogue journal where students keep a written communication with the teacher, Wang (1996) found in an earlier study that keeping a dialogue journal using e-mail was "fast, fun and convenient" (Wang, 1996, p. 6).

The social characteristic of the exchange is the next critical component in choosing the most appropriate software. If the exchange is one-on-one with the teacher the e-mail is the superior choice. However, by adding additional recipients, a blog would be a better choice. The key to selecting the most appropriate technology is to first design an epistemic discourse environment, then choose the mediating technology by focusing on the taxonomy of choice persistence, exchange, time and finally the audience. There is no single CMC technology that meets all of the functional and social requirements of each form of epistemic discourse. It is incumbent on the instructor, developer or educator to mix and match the most appropriate technology for the given epistemic activity.

In this section we briefly described the use of computer-mediated communication in language acquisition from Terence C. Ahern et al. 2008. Now we know that CMC remove the time and place constraints and the anywhere-anytime flexibility is a vital factor in creating authentic assignments. The real world problems and context through the computer medium can be reflected. In order to achieve success in use of CMC careful design of learning activity and choosing the most appropriate software is necessary. Computer-mediated technology is not a single software application but many technologies that possess both functional and social characteristics that govern its design

and impacts the effective deployment in the classroom i.e. there is not single integrated software there are many software and we instructors should select the most appropriate software for each epistemic discourse task.

In the next section we briefly discuss about how CMC can effect on the intercultural learning from Martina Möllering and Markus Ritter et al. 2008. Early studies in the field of CMC were focused on synchronous, written communication in the immediate context of the language teaching classroom, more recent definitions include synchronous as well as asynchronous, written as well as spoken, communication via computer i.e. recently research on CMC moved from the actual to the virtual e.g. transnational classroom.

In the context of language education one area of CMC which has generated great interest is asynchronous electronic communication between language learners in virtual classroom (e.g., Fischer, 1998; Lamy and Goodfellow, 1999). This field of research has been referred to as 'network-based language teaching' (c.f. Lee, 2004; Müller-Hartmann, 2000; Warschauer, 2000) or 'telecollaboration' (Beatty and Nunan, 2004; Belz, 2003; Greenfield, 2003; O'Dowd and Eberbach, 2004) as well as 'e-mail tandem learning' (Appel, 1999; Appel and Gilabert, 2002; Appel and Mullen, 2000; Brammerts, 1998; Käter, 2003; Little and Ushioda, 1998; Woodin, 1997).

Tandem language learning can be defined as a form of open learning where two learners with different languages form a partnership in order to practice and improve the language each is learning. This is described as a form of autonomous learning which focus on authentic communication with native speaker. Two people with different native languages work together in pairs in order to help one another improve their language skills but also to learn more about one another's culture and to exchange additional knowledge. As a result, a major part of process is the potential for intercultural learning. This is virtual classroom that students in it communicating transnationally.

In order to evaluation of intercultural learning in CMC we will discuss about some projects that eluded in Martina's paper. Recent publications on telecollaborative projects have directly addressed intercultural learning processes and outcomes. Furstenberg, Levet, English and Maillet (2001) report on the CULTURA project, a web-based, cross-cultural, curricular initiative "designed to develop foreign language students understanding of foreign cultural attitudes, concepts, beliefs, and ways of interacting and looking at the world" (p. 55). In an effort to foster mutual understanding across French and American cultures, CULTURA offers a comparative approach that asks learners to observe, compare and analyze parallel materials from their respective cultures and to exchange view points on these materials that include films, texts and online news media.

Hanna and de Nooy (2003) examined the varying success of four Anglophone students of French who were participating in a Web-based forum of the French newspaper *Le Monde*. The intercultural dimension consists of a relationship between native and non-native speakers, rather than a relationship between groups of non-native speakers. Hanna and de Nooy (2003) suggest that in conventional e-mail exchanges, there is no sense of the difference between

a conversation between two people and public discussion. Qualitatively analyzing the content of their subjects of contributions to the forum, the researchers suggested that adherence to the rules for acceptable cultural behavior in the genre 'Internet forum' is the measure for successful participation. In other words, competence in the target language, as measured by correctness and fluency, plays a less significant role.

In a report on an e-mail exchange between Spanish and English second-year university language learners, O'Dowd (2003) identified key characteristics of e-mail exchanges which helped to develop learners' intercultural communicative competence and outlined those elements which may enable students to develop successful intercultural relationships. The writer descriptively described these characteristics that we don't discuss them here.

Whereas the studies discussed above analyze learner's contributions to outline exchanges on a content level, Belz (2003) has put forward a linguistically-grounded analysis of intercultural competence, based on appraisal theory and epistemic modality, in order to arrive at a more precise understanding of the social roles and interpersonal relationships that establish themselves in the negotiation of meaning:

Appraisal theory is a Hallidayian-inspired linguistic approach to the investigation of evaluative language in English, which focuses on the ways in which lexico-grammar may operate as a site for the formation, dissemination, but also contestation of speakers' attitudinal positioning or value systems. Analysis which interested in epistemic modality to examine the linguistic resources speakers use in order to express their degree of willingness to commit to the truth of a particular proposition (Belz, 2003, p. 70).

Belz relates her linguistic analyses to the attitude component of Byram's (1997) model of intercultural competence, reporting on the online contributions of two German and one American student participating in a telecollaboration project over a seven-week period. The three students were chosen in order to identify why their correspondence did not lead to intercultural learning, where this latter concept was defined in the terms of developing attitudes of 'curiosity and openness' (cf. Bayram, 1997). Belz concluded that her students were not able to establish and maintain functional intercultural relationships because they did not have sufficient knowledge of culture-specific patterns of interaction in their partner's language. The culture specific patterns she identifies in this exchange were:

The performance of critique

The discussion of taboo topics

The degree of directness in conversational discourse

Linguistic devices for the mitigation of opinions.

As mentioned above the knowledge of culture specific patterns can help to have better interaction and cultural cognition of partners that leads to better intercultural interaction and learning as well as better language learning.

Now we discuss about challenges in transnational CMC. What these studies indicate is that the understanding of intercultural learning in online projects can profit from a focus on instances where intercultural communication did not succeed. Furstenberg's (2001) study provides an

impressive model of a comparative approach that evaluation of which shows very positive results. Hanna and de Nooy's (2003) study and Belz's (2003) report are in the same way. Both of them provide a report on breakdown of communication between online partners because of failure to behave according to the norms accepted by native speakers. The outcome of linguistic data analysis obviously shows the interconnection of language learning and intercultural learning (cf. Kramersch, 2003).

Telecollaboration projects have also shown a certain potential for developing autonomous learning. A number of telecommunication studies have stressed the importance of embedding e-mail exchanges into structured language learning environments thus providing a bridge between the classroom and the natural language setting (cf. Woodin, 1997). There are differences in students' expectations regarding grammatical accuracy, message length, and response time (Ware, 2005). Belz suggested that problems can be mostly avoided if both of teachers and students be aware of their partners' expectations.

O'Dowd and Ritter (2006) developed a structured inventory of factors which may lead to cases of 'failed' communication in online exchanges. In sum, ten different factors are suggested at the individual (here in particular the learner's current level of intercultural competence (ICC), classroom and socio-institutional level (p. 629).

The implications of learning and teaching are extensive issues and they have not been mentioned here. We just discuss about them one paragraph briefly. The framework of analysis presented by O'Dowd and Ritter (2006) provides a useful structure for a discussion of teaching and learning issues in telecollaboration projects. Those issues exemplified with the use of data collected in the context of a German-Australian telecollaborative project, which has been running between 1999 and 2006 (Mörling, 2004, 2005; O'Dowd and Ritter, 2006). On (Martina Mörling, 2008) the discussion moved from socio-institutional level, through the classroom level, to the individual level. For more information regarding implications see [6].

## VII. FUTURE TRENDS

In more recent investigations of the contribution of CMC to the language learning process, the focus has been on the spoken language and its integration with written text. This line of enquiry has led to the question of whether the concept of 'literacy' needs to be redefined in the electronic age (e.g., Murray, 2000; Richards, 2000) and whether electronic discourse can be seen as a new hybrid, located somewhere between the written and the spoken (Muniandy, 2002). With daily increasing extension of internet and computer benefits in routine procedures, tasks, jobs as well as entertainment and education both at home and in school makes the next generations the computer generation, at that, children grow with electronic devices specially with computer and internet. This increasing growth of computer and relevance technologies will make to redefine the concept of 'literacy' in the early future and also electronic discourse with growth of internet speed and spread will be located between written and spoken.

There are many software such as e-mail, text and audio chatroom, audio and video conferencing, blogs and Wikis and so on that any of them is the most appropriate for particular epistemic engagement. For matching each instructional task with most appropriate technology instructors must consider some factors. CMC has four essential characteristics time, persistence, exchange and audience. The archival and social characteristics are the most important for matching appropriate technology and instruction. As mentioned before choosing the most appropriate technology is based on understanding the intended discourse goals, to do this first design of an epistemic discourse environment is needed then by focusing on the taxonomy of choice persistence, exchange, time and audience the mediating technology can be chose.

To solve this problem creating an integrated technology including such as e-mail, chatroom, blog or wiki that can adjust itself with what instructors or designers need, can help them to remove the choosing the most appropriate technology. It can be used for every instructional task and match with all kind of instructions with purpose of both language learning and intercultural interaction. This software should be run on the internet and can allocate special space on the internet for universities, colleges, institutions, organizations, NGOs, or even independent groups for education, interaction, discussion and discourse among several cultures, nations, countries with different or same language.

Participating can register in the space that allocated for their group members, and then they can interact or discuss one-on-one or one-on-many asynchronously or synchronously with sending e-mail to one another or to many, blogs, wikis, text chatting or audio/video conferencing and so on which all of these facilities are integrated in single software. The learners that contribute the virtual class can speak different or same language with instructor or not, partners with different language and culture can help together and correct their writings and give grades together and also instructors can supervise the students' process of progress, therefore guide them to improve their skills and cultural behaves accepted in target language and this process can affect the students' final grade, however the integrated software can correct the learner writings by itself and give them the proper grade and can save the students' process of developments in plots or charts or at special report format and report them to tutors.

A new trend that can arrive in this field is the use of virtual reality integrating with CMC technology which can aim language learning. Virtual reality is software which can emulate the real world conditions, problems, contexts and so on that user could interact with it similar real world. As has been shown in figure.3 immersive virtual reality has low accessibility and interactivity but has high richness. If it has been integrated with other form of CMC technology such as threaded discussions, e-mails and so on resulted in integrated software which is improved in all aspects of accessibility, interactivity and richness. The abilities that can be imagine for virtual reality is like that learners can virtually place themselves in real positions and locations such as a park, garden, bus station, police station, zoo, museum, school,

college, campus, and etc, hence they can observe, discuss and experience in such remarkable situations which makes learning of target language and culture more tangible, exciting, wonderful and enjoyable.

With increasing growth of electronic, computer and networking technologies in hardware and software will open new horizons in the field of computer-mediated learning which can help to improve designing and implementing of delivery models particularly epistemic engagement or education technology and educational technologies.

### VIII. CONCLUSION

To date, the research on CMC-aided language acquisition shows a great potential, both for language and intercultural learning (Martina Mödlering, 2008). As mentioned in this paper we understand that language acquisition without understanding of culture and mores of that society is impossible, therefore the aim of CMC in intercultural learning can help to improve language teaching and learning, hence there is a interconnectedness between language acquisition and intercultural learning. Although there is a particle difference between them, language acquisition take place between partners with same language that there is a tutor who leads them, but intercultural learning take place between partners with different language e.g. between an American participating and a learner from France without an instructor.

Although the use of CMC can help us to learn secondary language, it can help us to learn third and more languages with this approach that partners who have different native languages for example a student from France and a his/her partner from Germany that both of them knows English, then each of them help another to learn his/her native language, therefore both of them knows English as secondary language and attempt to learn another language (i.e. French or German)

as third language. As this study indicates, implementing CMC in designing authentic experiences is not a trivial exercise, but it needs careful consideration both of the software and learning outcomes. For choosing the most appropriate delivery technology instructors require perfect understanding of intended discourse goal.

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**Arash Dehghanian** was born in Maragheh, Iran on December 24<sup>th</sup> 1984. He graduated from Tabriz Islamic Azad University in software engineering in 2008. He is Master student of Qazvin Islamic Azad University on Mechatronics now. He is interested in Neural Networks, Fuzzy logic, Fuzzy neural networks and Bioinformatics.



**Mehdi Azizi** is a member of Young Researchers Club at Maragheh Islamic Azad University. He studied ELT and his interests are second language acquisition, lexical network studies, and task – based learning and teaching and has published several papers in these areas. Also he is the former president of English Language Association at IAU.