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## Editorial

# Generation Gaps

Donald G. Perrin

Each generation is a product of our ever changing social and cultural environment. We have different values, different music, and different experiences based on the social, political, and economic conditions in our formative years. Differences are exaggerated by the country and culture into which we are born and specific family values from previous generations. These differences are reflected in our language, values, how we communicate and how we learn. It is also reflected in our adoption of communication technologies.

Recent Pew Foundation studies show that as we get older, we are less likely to use newer technologies. If we compare adoption of the Internet and cell phones we see some differences, but across the spectrum from internet, email, cell phones, and text messaging, we see a substantial decrease in use of the newer technologies. Here are some numbers from the Pew Studies.

Generation and age group	Age Group	Internet Use in last 24 hours	Cell Use as primary phone	Texting % cell phone users
Generation Y (28 and younger)	18-29	75%	72%	87
Generation X 29-43	30-49	69%	39%	68
Baby Boomer 44-60	50-64	60%	23%	38
	65-74	48%	5%	11
	75+	16%		

From: <http://pewsocialtrends.org/assets/pdf/getting-old-in-america.pdf>

Older people are much less likely to use social media such as blogs and text messaging. To quote the Pew report: "If there's one realm of modern life where old and young behave very differently, it's in the adoption of newfangled information technologies."

Teachers play a major role in determining which communication technologies are used for teaching and learning. This raises the question of a generation gap, especially for older teachers. Do we need additional training and additional technical support to close this gap, and to what extent will such effort be successful?

In this issue we have in-depth exploration of critical thinking. We see evidence of teachers adopting mobile devices and social communication media for teaching and learning, and for improved communication and collaboration among teachers. We see how Wikis simplify collaborative development of ideas, research studies, and teaching/ learning materials. Entrepreneurial teachers that experiment with these media become early adopters. To the extent they are successful; other teachers will be motivated to follow.

Teacher training institutions are a weak link in our educational systems. The curriculum reflects needs of the past, not the future. Testing methods are benchmarked against the past, not the future. And testing must be redirected to performance testing for higher levels of learning, critical thinking, and problem solving.



**Editor's Note:** This study provides in-depth analysis of the literature related to instructional presence and critical thinking on the context of distance learning. It compares models of inquiry and conducts a simple study to determine the role of teaching presence to foster critical thinking in an online conference.

## **Empirical Study of Teaching Presence and Critical Thinking in Asynchronous Discussion Forums**

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### **Abstract**

The discussion forum is a significant component of online courses. Instructors and students rely on these asynchronous forums to engage one another in ways that potentially promote critical thinking.

This research investigates the relationships between critical thinking and teaching presence in an asynchronous discussion environment through quasi-experiment, pre-test-post-test design. The results demonstrate that when teaching presence was increased in the discussion forum there was a significant increase in learners' level of critical thinking.

**Keywords:** Critical thinking, teaching presence, asynchronous discussion forum, online learning, Moodle, content analysis, validity, community of inquiry, quasi-experiment

### **Introduction**

Today critical thinking is recognized as one of the main goals in education (Schafersman, 1991; Garrison, Anderson, & Archer, 2000; MacKnight, 2000; Moore, 2004; Perkins & Murphy, 2006; Arend, 2009), yet many educators are confused about what it means and how to develop critical thinking in academic settings. For example, educators often proclaim that they want their learners to use critical thinking skills, but instead focus learner efforts on rote learning (McKeachie, Pintrich, Lin, & Smith, 1986; Duron, Limbach, & Waugh, 2006). Time and again critical thinking is seen as isolated goal unrelated to other important goals of higher education, but rather it is an influential goal which, done well, simultaneously improves the thinking skills of learners and thus better prepare them to succeed in the world (Ennis, 1992). In this digital age, with the number of online courses increasing every day the issue of ways for teaching learners how to think, instead, of teaching them what to think when teaching subjects is most widely debated topic amidst the educational community. It is an important issue because online courses in higher education are no different to on-campus courses in the goal of improving critical thinking among students.

Like on-campus learning, online learning has transformed into a learner-centered constructivist environment from a teacher-directed and static content environment (Lock & Redmond, 2006). Online learning is learning and teaching by means of advanced learning technology. Most online learning situations use combination of learning technologies. An example of this is Moodle, which has the capacity to use discussion board, wiki and real time textual chat. Discussion board is an asynchronous text-based computer-mediated communication tool. Unlike, on-campus learning, in online learning, teachers and students seldom meet face-to-face and facilitating interactive discussions is often challenging. As if sent by God, discussion board is a promising tool to cope with this problem. Asynchronous discussion forum provides teachers and learners with most opportunities to engage one another in ways that can potentially promote critical thinking in an online course (Kanuka & Anderson, 1998; Jonassen, 1994; Buraphadeja & Dawson, 2008, Arend 2009). Murphy (2004, p. 295) argued, "although asynchronous

conferencing might afford or support opportunities for engagement in various cognitive processes such as critical thinking, it does not guarantee it". As in the case with face-to-face discussions, untested teaching methods and techniques in online discussions can trigger uncertainty in the practice of best methods for improving critical thinking (Arend, 2009).

Understanding the constructivist model of learning provides insights into directions to take to promote critical thinking in an online course. The basic premise of constructivism is that learners "construct their own understandings through experience, maturation, and interaction with the environment, especially active interaction with other learners and the instructor" (Rovai, 2007, p.78). In addition, "social constructivism reminds us that learning is essentially a social activity, that meaning is constructed through communication, collaborative activity, and interactions with others" (Swan, 2005, p. 5). Supporters of constructivist theory often cite that online asynchronous discussions support learners in various cognitive processes, such as critical thinking through engagement with other learners and the instructor. However, Murphy (2004) cautioned that engagement cannot be derived from a context of use of a medium of communication, but instead, as a consequence of 3 factors, such as: (1) instructional design of online asynchronous discussion, (2) the standards set by the moderator of the discussion, and (3) the character of interactions between discussants and, as well, the issue or topic under consideration. The literature suggests that a number of researchers have analyzed discussion forum transcripts to investigate various cognitive processes, such as problem solving (Murphy; 2004), knowledge construction (Kanuka & Anderson, 1998), and critical thinking (Garrison, Anderson & Archer, 2001; Meyer, 2003; Goodell & Yusko, 2005).

Generally, efforts to measure critical thinking in online discussions have produced mediocre results. Maurino's (2007) review of research of critical thinking in online threaded discussion demonstrated lower critical thinking levels of messages in 37 studies. Maurino recommended more research on the instructor's viewpoint. She stated that further instructor involvement is indicated in much on the research, but most studies have been focused on students rather than instructor. This scenario divulges the need to investigate and develop models and frameworks to fathom the intricate disposition of learning and teaching in the online environment. One such widely researched model based on constructivist principles is Community of Inquiry framework developed by Garrison, Anderson, and Archer (2000). The Community of Inquiry framework is comprised of three overlapping elements: social presence, cognitive presence, and teaching presence. Reviews of research within the Community of Inquiry framework have drawn similar conclusions as Maurino's (2007) study. For example, in Garrison and Arbaugh (2007) review of research done within the Community of Inquiry framework, they noted that, while learning does indeed occur in the context of online discussion, few studies show evidence that it moves to the higher levels of critical thinking. Swan, Shea, Richardson, Ice, Garrison, Cleveland-Innes, & Arbaugh (2008) as well as Garrison (2007) suggested that this may have something to do with teaching presence. In the Community of Inquiry framework, teaching presence has three components: (1) instructional design and organization, (2) facilitating discourse, and (3) direct instruction. These categories align well with the 3 factors identified by Murphy (2004) as aforementioned. According to Murphy, engagement in asynchronous discussion forum is derived from these 3 factors. The three categories of teaching presence are closely aligned with those identified by Murphy. This indicates that teaching presence can stimulate engagement in asynchronous discussion forums. According to the constructivist theory, meaning (critical thinking) is constructed through communication (engagement) and since teaching presence supports engagement, it can be concluded that teaching presence may support critical thinking. Yet, the question, "what is the effect of teaching presence on learners' level of critical thinking", remains largely unanswered due to the fact that to date there has been no empirical study to confirm this.

Therefore, in this study it is hypothesized that, if critical thinking is related to teaching presence, then exposing learners participating in the asynchronous discussion forums to high teaching presence will result in high level of critical thinking. This paper explores the learners' perception of the asynchronous discussion forum.

The remainder of this paper is arranged in five sections. The first section reviews the literature. The second section discusses the theoretical framework of this study. Section three describes the background of the study and methods used to design the experiment, and the validity of the content analysis. The paper concludes by discussing the findings and their implications for those interested in researching online learning, with particular emphasis on future directions for increasing teaching presence and critical thinking in asynchronous discussion forums.

## Literature Review

### ***The importance of critical thinking in education***

Critical thinking is generally recognized as an important skill, and one that is primary goal of education (Schafersman, 1991; Garrison, Anderson, & Archer, 2000; MacKnight, 2000; Moore, 2004; Perkins & Murphy, 2006; Arend, 2009). Educators concern with critical thinking is not new, over the last 30 years education pioneers have focused on critical thinking skills more than ever on premises that knowing how to think is more important than knowing what to think in the age of information (Özmen, 2008). The value of critical thinking was evident among 40,000 faculty members in a 1972 study in which 97% of the respondents indicated that the most important goal of education is to foster students' critical thinking ability (Paul, 2004). With the increasing acceptance of the importance of critical thinking, educational institutes have added the requirement to encourage critical thinking to their graduate profiles (Corich, 2009).

Critical thinking remains highly valued in all fields of study. For instance, it is required in the workplace, it can help you to deal with mental and spiritual questions, and it can be used to evaluate people, policies, and institutions, thereby avoiding social problems (Duron, Limbach, & Waugh, 2006). A similar statement by Özmen (2008) is that "critical thinking in educational settings is crucial for establishing infrastructure of democratic societies, and of a new generation whose life is based on scientific thinking in lieu of medieval remains of thinking and living habits" (p. 119). No doubt educators agree that critical thinking is an important goal of education.

### ***Cultivating critical thinking through asynchronous discussion forums***

Given the importance of critical thinking in education as mentioned above, how can online discussion forums be used to facilitate critical thinking? Despite the ever-increasing popularity and prospective value of online asynchronous discussions, there is still no clear indication of how online asynchronous discussion can be utilized to promote critical thinking among students (Perkins & Murphy, 2006; Bullen, 1998). According to Lewinson (2005), the extent and way in which asynchronous discussion forums are being used in the online courses has branched off in different directions. For example, it may be a primary component of an online course serving as a virtual classroom, or it may only serve as a supplementary resource to other learning technologies. Moreover, according to Lewinson (2005), in either of these instances asynchronous discussion forums may be extremely structured as instructors provide specific questions for learners to address, or it may be extremely unstructured whereby it may serve as a forum for community building among learners.

Online asynchronous discussion is argued to have many benefits for student learning, such as helping learners negotiate higher levels of understanding and sharing and developing alternative viewpoints in a flexible environment (Rovai, 2000; Berge, 2002; Garrison, 1993). It is learner centered; therefore, it is not dominated by instructor contributions (McLoughlin & Mynard, 2009). For instance, some studies show that most online discussions contain instructor

contributions of only 10% to 15% (McLoughlin & Mynard, 2009). In addition, participating in online asynchronous discussion is convenient because they are neither time or place dependent (Hew & Cheung, 2003) and does not require all participants to be online simultaneously. Asynchronous communication allow learners some control while increasing ‘wait-time’ and general opportunities for reflective learning and processing of information (Hara, Bonk, & Angeli, 2000). Moreover, asynchronous online discussion can be considered as a means to enhance student control over learning and make the educational experience more democratic (Harasim, 1989). Many instructors report that online discussions benefit shy or native students by allowing them an opportunity to read and develop their remarks and to think critically (Bhattacharaya, 1999; Chickering & Ehrmann, 1996; Warschauer, 1996). In addition, discussion-boards store a permanent record (Meyer, 2004; Cheong & Cheung, 2008) of interaction that is easy to archive, search and evaluate.

Despite the benefits of online asynchronous discussion, some potential obstacles may hinder its effective use. A discussion forum is very often an add-on after transmitting content to the learners and initially it is quite challenging to motivate students to participate, largely due to the unstructured nature of the process (Grandon, 2006). According to Grandon, active participation only occurs when the discussion task is graded. Rovai (2007) concurs with Grandon’s assertions that grading strategies increase students’ extrinsic motivation to interact and this results in a significant increase in the number of student messages per week for courses in which discussions were graded. On the contrary, Knowlton (2005) argued that graded discussion impedes students from active participation and freely reflecting on others’ contribution, rather students only participate in order to attain the minimum standards. Along the same line of reasoning, Ou, Ledoux, and Crooks (2004) insisted that “if the instructor is totally absent from the discussions, learners might feel abandoned and be satisfied with providing superficial responses to the task as assigned in order to get a grade” (p. 2989). Some students also rebel against graded discussions as they believe that graded discussions impinges on “free and open participation in the discussion” (Warren, 2008, p.3). Moreover, poor online discussion may result from poorly designed discussion topics, and infrequent or non-existent, irrelevant or negative instructor feedback (Whittle, Morgan & Maltby, 2000). Another potential weakness is loss of social cues that occur in face to face interactions, which have energy and nearness that is significant to some instructors and learners (Meyer, 2003). In contrast, Chen and Chiu (2008) argued that words and symbols can be used in online discussions to express social cues. According to Chen and Chiu (2008) words and symbols can convey

positive feelings (“I’m feeling great . . .”, jokes, symbolic icons like “:)” or “-”) [emoticons], compliments (“You are so smart!”; Hara et al., 2000), thanks (“Thanks for your answer!”), and so on. Or, they can express negative feelings such as anger (“My solution is not wrong!!!!”), regret (“I should have learned it before . . .”), shyness (=^\_\_\_^= [blushing]), apologies (“I’m sorry for having given you the wrong answer.”), and condescension (“your answer is ridiculous.”) (p. 681).

Although asynchronous discussion has its weaknesses, Rovai (2007) asserted that skillful facilitation of the online discussions by the instructor can decrease and even eliminate these weaknesses. Throughout the literature in this area, it is generally claimed that critical thinking can be taught through online discussion (MacKnight, 2000). In fact, thinking is a natural process, but left to itself, it is often biased, distorted, partial, uninformed, and potentially prejudiced; excellence in thought must be cultivated (Scriven & Paul, 2007). Schafersman (1991) indicated that learners are not born with the ability to think critically; neither do they develop this naturally beyond survival level thinking. Schafersman argued that peers and most parents cannot reliably teach critical thinking. Instead, he concluded that trained and knowledgeable instructors are essential for teaching critical thinking.

By contrast, other researchers (Li, 2003; Mazzolini & Maddison, 2003) have reported that peer messages are more effective than instructor messages at motivating discussion and that instructor presence can in fact shut down dialogue. Similarly, Gagne, Yekovich, and Yekovich (1997) claimed that peer influence has greater impact on learning than instructor influence. On the other hand, Kay (2006) argued that instructor presence is required to correct misconceptions that spring up early on in the learning process. Likewise, it should never be presumed that students know how to effectively participate in discussion forums (Ellis & Calvo, 2006). In the midst of such claims, MacKnight (2000) explained that it should not be assumed that all learners will come with necessary skills to advance in an online discussion, nor it should be assumed that instructors have sufficient skills and practice in monitoring discussions or skills in creating productive communities of online learners. He suggested that both may need training and support. Arend (2009) reported that, critical thinking appears to be best among learners when a more consistent emphasis is placed on the discussion forum, and when instructor facilitation is less frequent but more purposeful. From the foregoing discussions, one can hypothesize that a proficient instructor can cultivate critical thinking within asynchronous discussion forums through instructional design and organization, facilitating discourse, and direct instruction. This being established, together with the stated importance of critical thinking in education, it is vital to have a clear understanding of what is critical thinking.

### ***Critical thinking: what is it?***

What is critical thinking? Actually, that is a critical question. Most scholars say that critical thinking is “good thinking”. The idea of critical thinking has been a highly debated concept among the education communities in the recent years. An investigation of the literature reveals various definitions of critical thinking.

The concept of critical thinking can be traced back to the beginning of the twentieth-century. John Dewey’s (1933) theory of practical inquiry included three situations – pre-reflection, reflection and post-reflection. He defined reflective thinking as “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends” (1933, p. 9). Dewey believed that education must engage with and enlarge experience and that an educator’s role was to encourage students to think and reflect. Another major historical source of critical thinking during the mid twentieth-century was Benjamin Bloom’s (1956) cognitive taxonomy of educational objectives. The upper end of Bloom’s intellectual scale, analysis, synthesis, and evaluation, is often equated to critical thinking (Kennedy, Fisher, & Ennis, 1991; Gokhale, 1995).

Facione (1984, p. 260) claimed that “critical thinking is an active process involving constructing arguments, not just evaluating them”. He refers to a set of preliminary skills that can enable students to construct arguments:

1. Identifying issues requiring the application of thinking skills informed by background knowledge;
2. Determining the nature of the background knowledge that is relevant to deciding issues involved and gathering that knowledge;
3. Generating initially plausible hypotheses regarding the issues;
4. Developing procedures to test these hypotheses, which procedures lead to the confirmation or disconfirmation of those hypotheses;
5. Articulating in argument from the results of these testing procedures; and
6. Evaluating arguments and, where appropriate, understandings developed during the testing process. (p. 261)

According to this definition, critical thinking is a process of building arguments for problem solving. Similarly, Scriven and Paul (2007, *Defining Critical Thinking*, ¶1) defined critical thinking as a set of macro-level logical skill. They stated that “critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action.”

However, not all educators agree with macro-level definitions of critical thinking. Some educators prefer to take a more micro-level approach. For example, Beyer (1985, p. 303) argues that critical thinking is not a process “at least not in the sense that problem-solving or decision-making are processes; critical thinking is not a unified operation consisting of a number of operations through which one proceeds in a sequence”. Beyer and others (Rudin, 1984; Fritz & Weaver, 1986) believed that critical thinking is a set of discrete skills. According to this explanation, students will have to choose and apply discrete skills.

Recently, Hanson (2003, p.203) took exception to both perspectives. Instead, she concluded that “a critical thinker has to engage not only with micro questions within the text, both at the superficial and the deep readings, but also with macro-issues surrounding topics” (p.203). She described that “core of critical thinking is the constant considered identification and challenging of the accepted”. Hanson posited that critical thinking:

involves the evaluation of values and beliefs as well as competing truth explanations and of course texts; it involves both rationality/objectivity and emotions/subjectivity; it involves the questioning of the very categories of thought that are accepted as proper ways of proceeding and to ensure that one always:

*Searches* for hidden assumptions;

*Justifies* assumptions;

*Judges* the rationality of those assumptions; and

*Tests* the accuracy of those assumptions. (p.203)

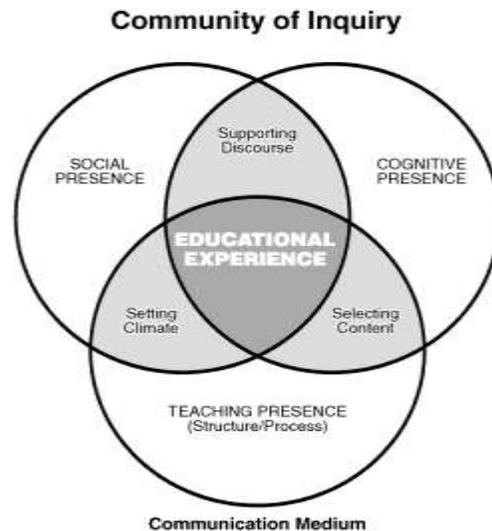
As mentioned above there are many definitions of critical thinking and choosing a single definition even from the few listed above is difficult. Some, such as Hanson (2003) focus on both macro and micro level logical skills. Others, such as Facione (1984), and Scriven and Paul (2007) focus is on macro-level logical skills. However, it seems irrational to except a single definition to encompass all the competences that might be displayed by critical thinkers. Tice (1999) pointed out that perhaps the reason that we struggle to decide upon a single definition of critical thinking is because it can not be narrowly contained. She asserted that definition of critical thinking varies according to context, and that does not indicate that we have been inconsistent in our definition. Lastly, Tice concludes that a core element of critical thinking is that it varies by context and we should accept the ability to tolerate ambiguity and to distinguish among several shades of gray is an important characteristic of critical thinking.

Many different definitions of critical thinking is one of the problems plaguing research in this area since most educators have spent more energy on defining critical rather than working on ways to improve it. That is why this paper questions the relationship between teaching presence and critical thinking within asynchronous discussion forums. It requires, not a definition of critical thinking, but instead, a model that focuses on supporting critical thinking in a completely on-line learning environment. As mentioned in the introduction of this paper, Community of Inquiry is one such model. This theoretical framework has grown in prominence and has been used in hundreds of studies over the last decade (Swan et al., 2008). Therefore, this study was constructed from the Community of Inquiry theoretical framework. The subsequent section describes the theoretical framework for this research.

## Theoretical framework

### **Community of Inquiry framework**

Garrison et al. (2000, p. 89), asserted that critical thinking is “a process and outcome that is frequently presented as the ostensible goal of all higher education” and developed a Community of Inquiry model (see figure 1 below) to guide computer-mediated communication to support critical thinking. They argued that deep and meaningful online learning occurs through the interaction of three core elements: social presence, cognitive presence and teaching presence. The genesis of this framework is found in the work of John Dewey and is consistent with the constructivist approaches to learning in higher education. From a theoretical perspective, there has been significant evidence attributing to the validity of Community of Inquiry framework (Garrison & Arbaugh, 2007; Swan et al., 2008; Shea & Bidjerano, 2009). Judging by the number of studies that have used the Community of Inquiry framework as a guide, the Community of Inquiry (CoI) framework was selected to serve as the theoretical framework of this study.



**Figure 1. Community of Inquiry Framework**

Adapted from Garrison, Anderson, and Archer (2000).

Within the structure of the CoI framework, cognitive processes such as critical thinking takes place as an element of cognitive presence. Garrison et al. (2000) emphasized that cognitive presence is the most significant element in critical thinking. They cited teaching presence as being most central to their framework, since “appropriate cognitive and social presence, and ultimately, the establishment of a critical community of inquiry, is dependent upon the presence of a teacher” (Garrison et al., 2000, p. 96). Garrison et al. (2000) explained that the teaching presence can be performed by either the teacher or the learner in a Community of Inquiry. However, they pointed out that in an educational environment, teaching presence is a primary responsibility of the teacher. Therefore, in this study teaching presence is considered as the primary responsibility of the teacher. Garrison et al. (2000) even hypothesized that the lack of teacher presence may result in decrease in cognitive process. This indicates that critical thinking that occurs in the element of cognitive presence is dependent on teaching presence. In the sections that follow, each of these two elements is described. The subsequent sections also examine categories and indicators to access teaching presence and critical thinking and to guide the coding of discussion forum messages. The process of coding is basically one of selective reduction, which is the central idea in content analysis. By breaking down the contents of materials into meaningful and pertinent units of information, certain characteristics of the message can be analyzed and interpreted.

### **Assessing teaching presence**

In the Community of Inquiry framework, teaching presence is defined as “the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes” (Anderson, Rourke, Garrison, & Archer, 2001, p. 5). Anderson et al. (2001), conceptualized teaching presence as having three categories: (1) instructional design and organization, where instructors and/or course designers develop curriculum, activities, assignments and course schedules; (2) facilitating discourse, where instructors set climate for learning by encouraging and drawing students into online discussion; and (3) direct instruction, where instructors present content and focus and direct online discourse. They developed a template for guiding the coding of computer conference transcripts for assessing teaching presence. This particular template contained 3 categories and 18 indicators as shown in Table 1. Each indicator is accompanied with a sample sentence that shows certain key words or phrases.

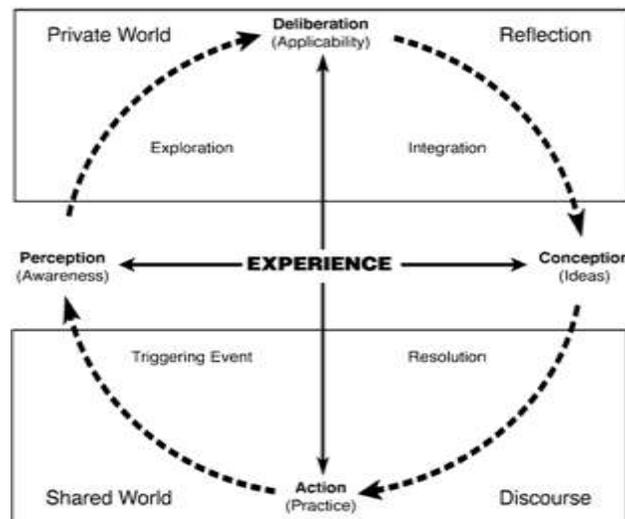
**Table 1**  
**Teaching Presence coding template**  
 Adapted from Anderson et al. (2001).

<b>Instructional Design and Organization</b>	
<b>Indicators</b>	<b>Examples</b>
Setting curriculum	"This week we will be discussing..."
Designing methods	"I am going to divide you into groups, and you will debate..."
Establishing time parameters	"Please post message by Friday..."
Utilizing medium effectively	"Try to address issues that others have raised when you post"
Establishing netiquette	"Keep your message short"
<b>Facilitating Discourse</b>	
<b>Indicators</b>	<b>Examples</b>
Identifying areas of agreement/disagreement	"Joe, Mary has provided a compelling counter example to your hypothesis. Would you care to respond?"
Seeking to reach consensus/understanding	"I think Joe and Mary are saying essentially the same thing"
Encouraging, acknowledging, or reinforcing student contributions	"Thank you for your insightful comments"
Setting climate for learning	"Don't feel self-conscious about 'thinking out loud' on the forum. This is a place to try out ideas after all."
Drawing in participants, prompting discussion	"Any thoughts on this issue?" "Anyone care to comment?"
Assess the efficacy of the process	"I think we're getting a little off track here"
<b>Direct Instruction</b>	
<b>Indicators</b>	<b>Examples</b>
Present content/ questions	"Bates says... what do you think"
Focus the discussion on specific issues	"I think that's a dead end. I would ask you to consider..."
Summarise the discussion	"The original question was...Pita said ... Mary said... we concluded that... We still haven't addressed..."
Confirm understanding through assessment and explanatory feedback.	"you're close, but you didn't account for...this is important because"
Diagnose misconceptions	"Remember, Bates is speaking from an administrative perspective, so be careful when you say..."
Inject knowledge from diverse sources, e.g., articles, internet, personal experiences (includes pointers to resources)	"I was at a conference with Bates once, and he said...You can find the proceedings from the conference at <a href="http://www...">http://www...</a> "
Responding to technical concerns	"If you want to include a hyperlink in your message, you have to..."

The validation issue of the 3 categories for assessing teaching presence has often debated how to practically make distinction between facilitation and direct instruction. Shea, Fredericksen, Picket and Pelz (2003), in their study of teaching presence and online learning concluded that 2 categories are more interpretable in practice. They labeled these 2 categories as design and directed facilitation. The authors conceptualized directed facilitation as a combination of facilitation and direct instruction. However, Arbaugh and Hwang's (2006) study validated the 3 categories of teaching presence. Recently, in the review of Community of Inquiry model, Garrison (2007), questioned the differences in the validation of teaching presence construct in both these studies. He explained that the difference may be due to nature of the analysis. Garrison concluded that all 3 categories of teaching presence are distinct, however, highly correlated with each other; and students may not be able to distinguish between facilitation and direct instruction. Thus, the coding template of Anderson et al. (2001) was chosen for this study. Another reason for selecting this template is because it is one of the few computer-mediated communications coding schemes to measure teaching presence that has an existing research base.

### **Assessing critical thinking**

Garrison et al. (2000) described cognitive presence as the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry. They asserted that, critical thinking takes place in the element of cognitive presence and is operationalized through the Practical Inquiry model (see Figure 2). Their Practical Inquiry model is rooted in Dewey's (1933) foundational ideas of practical inquiry.



**Figure 2. Practical Inquiry Model**

Adapted from Garrison, Anderson, and Archer (2000).

In the Practical Inquiry model, the process of critical thinking is defined as cognitive activity geared to four consecutive phases: (1) triggering event, where some issue or problem is identified for further inquiry; (2) exploration, where students explore the issue, both individually and corporately through critical reflection and discourse; (3) integration, where learners construct meaning from the ideas developed during exploration; and (4) resolution, where learners apply the newly gained knowledge to educational contexts or workplace settings (Garrison et al., 2001).

Garrison et al. (2001) developed a valuable template for guiding the coding of computer conference transcripts for assessing critical thinking process. They included descriptors, indicators, and sociocognitive processes in their template to provide sufficient guide for reliable categorization by coders. The guidelines for each of the categories are presented in Table 2.

**Table 2**  
**Cognitive Presence coding template**  
 Adapted from Garrison et al. (2001).

<b>Triggering Events</b>		
<b>Descriptor</b>	<b>Indicators</b>	<b>Sociocognitive Processess</b>
Evocative	Recognizing the Problem  Sense of puzzlement	Presenting background information that culminates in a question Asking questions Messages that take discussion in new direction
<b>Exploration</b>		
<b>Descriptor</b>	<b>Indicators</b>	<b>Sociocognitive Processess</b>
Inquisitive	Divergence-within the online community Divergence-within a single message Information exchange  Suggestions for consideration  Brainstorming  Leaps to conclusions	Unsubstantiated contradiction of previous ideas Many different ideas/themes presented in one message Personal narratives/descriptions/facts (not used as evidence to support a conclusion) Author explicitly characterizes message as exploration-e.g. "Does that seem about right?" or "Am I way off the mark?" Adds to established points but does not systematically defend/justify/develop addition Offers unsupported opinions
<b>Integration</b>		
<b>Descriptor</b>	<b>Indicators</b>	<b>Sociocognitive Processess</b>
Tentative	Convergence-among group members  Convergence-within a single message Connecting ideas, synthesis  Creating solutions	Reference to previous message followed by substantiated agreement, e.g., "I agree because..." Building on, adding to others' ideas Justified, developed, defensible, yet tentative hypotheses Integrating information from various sources-textbooks, articles, personal experience Explicit characterization of message as a solution by participant
<b>Resolution</b>		
<b>Descriptor</b>	<b>Indicators</b>	<b>Sociocognitive Processess</b>
Committed	Vicarious application to real world Testing solutions Defending solutions	None Coded

In a pilot study, Garrison et al. (2001) analyzed 24 message transcript and found that one-third (33%) of the postings did not relate to any of the four phases of the Practical Inquiry model, as such, they categorized this phase as 'other'. Oriogun, Ravenscroft and Cook, (2005, p. 212) suggested that "further testing of the practical inquiry model is required to ascertain its robustness and validity" and that "there is a real need to develop Garrison et al.'s (2001) framework, especially empirically testing it in relation to actual transcripts of online communications". On the contrary, several recent studies have confirmed the validity of the Practical Inquiry model (Meyer, 2004; Akyol & Garrison, 2008; Pisutova-Gerber & Malovicova, 2009, Shea & Bidjerano, 2009; Bangert, 2009). Finally, Practical Inquiry model is an appropriate model to define individual critical thinking skills and competences. Selecting a model for a research depends on factors such as "theoretical compatibility and practicality" (Perkins & Murphy, 2006). Therefore, in the context of this research, Garrison et al. (2001), cognitive presence coding template was applied to assess critical thinking in this study.

The next section overviews content analysis methodology and discuss validity issues of content analysis.

### **Content Analysis and Validity**

Content analysis is a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding (Krippendorff, 1980). Researchers have been using content analysis method for analyzing transcripts of asynchronous, text based, computer conferencing in educational settings (Rourke, Anderson, Garrison, & Archer, 2001, p. 2). Content analysis may be objective also know as manifest content when it involves counting the number of times a particular word or set of words is used or it may be subjective also known as latent content which depends on the rater's interpretation of the meaning of what has been written (Meyer, 2004). However, not all research questions, and especially assessing computer-mediated communication for higher-order learning outcomes like critical thinking, can be answered by focusing on the manifest content (Rourke et al., 2001).

Moreover, Berelson (1952) characterizes content analysis as primarily a descriptive technique. Nonetheless, researchers often want to expand the content analysis technique from descriptive to inferential hypothesis testing. Several researchers have used inferential content analysis method and "were able to draw convincing conclusions concerning different experimental or quasi-experimental conditions" (Rourke et al., 2001, p. 6). Furthermore, unitizing is a process in content analysis that identifies the segments of the transcripts that would be recorded, categorized and considered. Rourke, Anderson, Garrison, and Archer (1999) identified five units of analysis that have been used in computer-mediated communication researches including sentence, proposition units, paragraph units, thematic units, and message units. They further stated that a message unit is most practical though researchers most commonly use thematic units. Similarly, Rourke et al. (2001) stated two important advantages of message units; firstly, it is objectively identifiable and secondly, it produces a manageable set of cases.

The validity of content analysis depends largely on the inter-rater reliability, "defined as the extent to which different coders, each coding the same content comes to the same coding decision" (Rourke et al., 2001, p. 4). There are a number of statistical methods that can be used to determine inter-rater reliability. However, Rourke et al. (2001) recommended Cohen's kappa ( $k$ ) statistic to determine reliability. They explained that Cohen's kappa ( $k$ ) is a chance-corrected measure of inter-rater reliability that assumes two raters,  $n$  cases, and  $m$  mutually exclusive and exhaustive nominal categories.

The formula for calculating kappa is:

$$k = (F_o - F_c) / (N - F_c)$$

Where:  $N$  = the total number of judgments made by each coder

$F_o$  = the number of judgments on which the coders agree

$F_c$  = the number of judgments for which agreement is expected by chance.

The exact level of inter-rater reliability that must be achieved has not been clearly established. However, for Cohen's kappa, Capozzoli, McSweeney, and Sinha (1999, p. 6) stated that:

values greater than 0.75 or so may be taken to represent excellent agreement beyond chance, values below 0.40 or so may be taken to represent poor agreement beyond chance, and values between 0.40 and 0.75 may be taken to represent fair to good agreement beyond chance.

Finally, Cohen's kappa ( $k$ ) was used to test for the inter-rater reliability of the content analysis. In addition, taking latent content and message as a unit of analysis, this study investigated the effect of high teaching presence on critical thinking.

## **Background information**

This study was conducted at the University of the South Pacific (USP). USP is a regional university which serves twelve Pacific island nations (Cook Is., Fiji Is., Kiribati, Marshall Is., Nauru, Niue, Solomon Is., Tokelau, Tonga, Tuvalu, Vanuatu and Samoa). For the last thirty eight years USP has been offering courses and programmes via Distance and Flexible Learning (DFL) in a variety of modes and technologies. Currently, a Bachelor of Law programme is offered through DFL online mode enabled on Moodle (Modular Object-Oriented Dynamic Learning Environment) online learning management system. Moodle communication tools like chat, email, and discussion board are used for communication and interaction in many courses, depending on the course designer's discretion.

So far, the tool that offers most prospects for within course communication and interaction is the asynchronous discussion board. This is because the twelve regional island nations that USP serves have varied time zones, infrastructure and technology, that affect the use of the Moodle chat feature. Hence, chat is often ruled out as an essential component for communication because it does not only demand synchronous communication, but it also draws heavily on the available bandwidth. Moodle email has no obvious advantages because it only allows students to email others within the same course. Besides, all USP students have an email account that they use for personal communication.

Use of asynchronous discussion forums in Law courses is very popular as it is perceived as a platform for the students to engage in debate with other students, and develop their argumentation skills and thought. In short, it is perceived as very prospective tool for promoting critical thinking among students participating in the online discussions.

For these reasons, an undergraduate online Law course was selected for this research. This course was 14 week long with 94 registered students. In this course 10% of total assessment was based on students' online postings. At the beginning of each week the course instructor posted a discussion question and students were required to participate in discussions. The course instructor had over 2 years of online teaching experience and over 5 years of face-to-face teaching experience.

## **Research design and methods**

### ***Design***

A quasi-experimental, one group pre-test-post-test design was used for this study. Quasi-experimental methods are categorized as quantitative research that has roots in positivism, which emphasizes facts, relationships and causes concerning the educational phenomena (Wiersma & Jurs, 2005). In the quasi-experimental method, the researcher deliberately manipulates or varies at least one variable to determine the effects of variation (Wiersma & Jurs, 2005). In this study teaching presence, the independent variable, was increased to determine the effect on students' level of critical thinking.

### ***Sampling***

Stratified sampling technique was used, whereby all members of the population were ordered according to a single characteristic of members having access to internet daily. Availability of the internet to participants is considered vital in this study, as it eliminates the external variable of not able to participate in the online discussions due to unavailability of internet. Those members with daily access to internet were placed into 2 subgroups; males and females. From each group, 15 participants were selected using simple random technique. A total of 30 students participated in this study.

### **Procedure**

An undergraduate 14 week long online Law course was used to conduct this research. In this course 10% of total assessment was based on students' online postings. At the beginning of each week the course instructor posted a question in the discussion forum which was open for 7 days. This study was conducted from week 2 to week 6 of the course. At the beginning of week 2 of the course, a survey questionnaire was created in the Moodle course page. At the end of week 2 the survey questionnaire was analyzed and the participants for the research were selected using a stratified sampling technique as mentioned above. Pre-test period was during week 3. During this period the instructor participated in the forum in a normal manner. At the end of week 3, instructor and participant discussion postings were retrieved from the automatic computer-generated records of the Moodle discussion board. Two coders analyzed the transcripts to assess the teaching presence and critical thinking. Once the pre-test teaching presence and students level of critical thinking was analyzed, the course instructor discussed ways to improve and increase her presence in discussion forums by following the teaching presence coding template as a guide. During week 6 teaching presence was increased through more, encouragement, pedagogical comments and provided reinforcement and expert advice. After this intervention, discussion postings for instructor and participants during week 6 was retrieved and analyzed for teaching presence and level of critical thinking.

The secondary question of "learners' perception of the asynchronous discussion forum" was explored through an open ended questionnaire created in a Moodle course page. The results and sample responses are discussed below.

### **Data Analysis**

Teaching presence and critical thinking was analyzed using content analysis. Both the teaching presence and critical thinking variables were analyzed using 3 essential steps as outlined below.

1. The instructors and 30 participant's postings was compiled, into text files. For example, one text file for instructor and one text file each for the 30 participants.
2. Two coders were trained to use the coding schemes (See table 1 and table 2) that have been adapted for identifying and categorizing the teaching presence and critical thinking variables. Message unit analysis was used in this research since it is most practical, less time consuming, and facilitates unit reliability (Anderson et al., 2001). In this research, the message was coded as either illustrating or not illustrating one or more indicators of the categories of teaching presence and critical thinking. For example, rather than simply assigning each message unit that demonstrated some sort of teaching presence to only one and only one of the categories of teaching presence, I allowed for the possibility that a single message might exhibit characteristics of more than one category.
3. The inter-rater reliability was determined using Cohen's *kappa*.

### **Ethical consideration**

Participation was entirely voluntary. Information about the study was given to every participant to assure the protection of human rights. The students had the opportunity to determine their willingness to participate in the study. A signed, informed consent form was obtained from each student after the intervention was applied. This was done to ensure students' neutral responses to the intervention. The students were free to refuse to participate or withdraw from the study at any time without punishment. Confidentiality was ensured through the use of code numbers. The list of code numbers and associated names were kept separate from the actual data. The data obtained from the participants were used only for the study. The students were apprised that results would be submitted for publication.

## Findings

### ***Participant's characteristics***

A total of 30 subjects, 15 males (50%) and 15 females (50%), participated in this study. A 5 item questionnaire was created within the Moodle course page to collect descriptive data on participants. Results of the questionnaire revealed multiple age groups with a spread from 18 to 55-plus years. Participants were asked to indicate their marital status as well. 11(37%) were married and 19 (63%) were single. In terms of registration status, 10 (33.3%) indicated that they were enrolled full time, and the remainder were enrolled as part-time 20 (66.7%). Of the 30 participants, 29 (96.7%) had online learning experience while 1 (3.3%) had no previous experience with online learning. The variable academic level consisted of five categories: High school, Certificate, Diploma, Graduate, and Postgraduate. The distribution by academic level was: 64% High school, 13% Certificate, 3 % Diploma, 13% Graduate, and 7% Postgraduate.

### ***Pre-test–post-test teaching presence***

The instructor posted a total of 89 messages during pre-test and 154 message during the intervention period (post-test). Table 3 shows the frequency and percentage of teaching presence categories that were observed in the pre-test–post-test messages posted by the instructor. Percentages were calculated by dividing the total number of postings showing a given category of teaching presence by the total number of messages posted by the instructor. Direct instruction was the predominant category, with between 57.3% and 78.3% of all teacher messages including some form of direct instruction. Instructional design was the least frequently observed category of teaching presence, with between 33.7% and 40.3% of messages addressing instructional design. The total instances of teaching presence were calculated by adding the frequency of teaching presence categories. Total teaching presence during the pre-test was 123 and 328 during the intervention period. Total post-test teaching presence was 2.7 times more than the pre-test teaching presence.

**Table 3**  
**Pre-test and Post-test; Frequencies**  
**and percentage of teaching presence classifications**

	Pre-test		Post-test	
	f	%	f	%
Instructional Design	30	33.7	62	40.3
Facilitating Discourse	42	47.2	118	62.4
Direct Instruction	51	57.3	148	78.3
Total teaching presence	123		328	
Total instructor messages	89		154	

The inter-rater reliability for pre-test transcript was  $k = .79$ ; for post-test transcript, inter-rater reliability was  $k = .82$ . Capozzoli et al. (1999), that values greater than 0.75 or so may be taken to represent excellent agreement beyond chance.

### ***Pre-test–post-test critical thinking***

During the pre-test a total of 76 messages with a mean of 2.53 messages were posted by 30 participants. The highest number of messages post by an individual participant was 4 while the

lowest number of message posted by an individual participant was 1. Further analysis revealed that; 6 participants posted 1 message each, 8 participants posted 2 messages each, 10 participants posted 3 messages each, and 6 participants posted 4 messages each.

A total of 132 messages were posted during the post-test with a mean of 4.4 messages. Analysis showed that participants had posted multiple numbers of messages with a range of 1 to 6 messages per participant. At an individual level; 1 participant posted 1 message each, 3 participants posted 2 messages each, 5 participants posted 3 messages each, 2 participants posted 4 messages each, 12 participants posted 5 messages each, and 7 participants posted 6 messages each.

Table 4 shows the frequency and percentage of critical thinking classifications that were observed in the pre-test–post-test messages posted by the 30 participants. Percentages were calculated by dividing the total number of postings showing a given classification of critical thinking by the total number of messages posted by the participants. Triggering events was the predominant category, with between 36% and 56% of all participant messages. Resolution was the least frequently observed category of critical thinking, with between 6.6% and 25.6% of messages addressing resolution phase. Overall observation was that there was a significant increase in the post-test levels of critical thinking.

**Table 4**  
**Pre-test and Post-test; Frequency and percentage of critical thinking classifications**

	Pre-test		Post-test	
	f	%	f	%
Triggering Events	28	36.8	74	56.1
Exploration	23	30.1	73	55.3
Integration	9	11.8	41	31.1
Resolution	5	6.6	34	25.6
Total student messages	76		132	

The inter-rater reliability for pre-test transcript was  $k = .81$ ; for post-test transcript, inter-rater reliability was  $k = .80$ . Capozzoli et al. (1999), that values greater than 0.75 or so may be taken to represent excellent agreement beyond chance.

#### ***Pre-test–post-test teaching presence and critical thinking***

Table 5 illustrates the comparison of pre-test–post-test instructor’s total teaching presence with percentage of critical thinking classifications and mean of the percentage critical thinking classifications. The mean of percentage critical thinking classifications was calculated by dividing the total sum of percentage critical thinking classifications by 4 (total number of critical thinking categories). The analysis demonstrates that as the teaching presence increased there were significant increases in all the levels of critical thinking. By comparing the pre-test–post-test total teaching presence with the pre-test–post-test mean of critical thinking classification it was revealed that as the post-test total teaching presence increased by a factor of 2.7. Consequently, the mean of critical thinking classification increased by a factor of 2.

**Table 5**  
**Pre-test and Post-test; Total teaching presence**  
**and percentage of critical thinking classifications**

	Total Teaching Presence	Triggering Events	Exploration	Integration	Resolution	$\bar{x}$
Pre-test	123	36.8%	30.1%	11.8%	6.6%	21.3
Post-test	328	56.1%	55.3%	31.1%	25.6%	42.0

### ***Perception of asynchronous discussion forum***

All 30 participants responded to the 5 item open ended questionnaire. A variety of interesting comments were given by the participants. It was observed that it took approximately 3 weeks for all the participants to complete the questionnaire. Perhaps these questions required long answers. Three sample responses are included for each question to demonstrate students' perception towards online discussion forum.

#### **What is your motivation for participating in the forums?**

The majority of participants indicated that their motivation to participate in the discussion forum was that they wanted to score good marks. This agrees with Rovai's (2007) findings about using grading strategies to increase students' extrinsic motivation. Another prominent comment was that participants enjoyed positive arguments with other participants in the course.

##### *Sample 1*

I am assessed so it is important that I participate in every topic's discussion. The questions also help me to think critically, thereby improving my ability to think and analyze questions and situations.

##### *Sample 2*

Participation, articulating my thoughts and then evaluating them for precision and relevancy against other forum user's thoughts of particular topics. And the grading of course

##### *Sample 3*

Dialogue with others in the course and colleagues regarding questions from coordinator, assignments and study tasks. Forums are useful, especially when there is a heated debate between students.

#### **What can be done to improve your motivation?**

The common responses to this question was that participants wanted their discussion forum messages to be graded as soon as the forum closed rather than getting their marks at the end of the semester. Moreover, there was a huge demand for greater participation from the instructor. This indicates that instructors can by far and large motivate students to participate in discussion forums through active participation.

##### *Sample 1*

We should be marked weekly and told of our marks so that we know how we have performed. By seeing that other people are scoring better than us, it would motivate us to work harder and contribute more towards the discussion. If we are doing well, it will encourage us to do better each time.

##### *Sample 2*

With more participation from the Online Tutor or Coordinator, to guide my answers if they are correct or incorrect. There are many views shared on the discussion forum but we really need guidance as to what is the right answer.

*Sample 3*

More feedbacks from course coordinators when it is clear that my discussions are not in accordance or in line with the topics so that I can learn from my mistakes

**How do you feel about been accessed for your participation in the discussion forum?**

All the participants were satisfied that their discussion messages were graded. This contradicts, Warren (2008) report that some students rebel against graded discussion as they believe that graded discussion impinges on free and open participation in the discussion. In fact in this study majority participants indicated that since the discussion forum messages are graded they make sure that they provide valid and logical arguments and in doing so they get to read and understand their notes. They indicated that most of the time they only open their books in order to complete their assignments or to prepare for examinations.

*Sample 1*

I am happy because it is not so hard and we would get marks. It is like doing a mini assignment every week, which is better than doing lengthy and hard assignments or tests.

*Sample 2*

I feel that I may not get good mark if I do not put logical argument on the topic discuss.

*Sample 3*

I think it more appropriate for accessing my participation in the discussion forum for me to know, for other students to comment on my views and for me to see from their perspective on the discussion forum.

**What do you think about the instructor's participation in the discussion forum?**

Bulk of the participants commented that instructor's participation in the discussion forum was at an acceptable level, but a minority felt that more active participation was required. Most participants suggested that instructor presence is important as it clears misunderstanding and gives them confidence that they are on the right track. This confirms Kay's (2006) argument that instructor presence is required to correct misconceptions that spring up early on in the learning process.

*Sample 1*

Well done. My tutor contributes and encourages other students to discuss. She starts healthy discussions for us to continue.

*Sample 2*

Excellent. I look forward to those comments, because I then know that either I am on track or way off the mark.

*Sample 3*

I think the tutor's participation is very important for students. Through their guidance, we get to know if we are on the right track or not. The higher the number of contributions by the tutor, the better for the students.

**How do you feel when the instructor comments on your forum post?**

All the 30 participants gave positive comments for this question. For example they commented that they felt; happy, motivated, great, special, and proud.

*Sample 1*

I feel motivated and see that there is more to contribute. Helps me to improve in my discussions.

*Sample 2*

Personally I am happy because in doing so, the tutor help put me back on track. I learn more this way.

*Sample 3*

I feel great that I get feedback and know whether I am wrong or right.

## Discussion

The results revealed that as the teaching presence increased there were significant increases in all the levels of critical thinking (see Table 5). This is consistent with, McLoughlin and Luca's (1999) findings that when an instructor interfered in the discussion, he was able to guide students into higher level of critical thinking. The coders understood the concept of Community of Inquiry and the Practical Inquiry models in a very short time (within a week). They found both the Anderson et al. (2001) teaching presence template and the Garrison et al. (2001) cognitive presence coding template enabled them to easily categorize the indicators. The Practical Inquiry model was used successfully to categorize indicators for critical thinking in this study.

It was also observed that, most of the time, participants posted their messages at night. This indicates that discussion occurs regardless of time and place in online asynchronous discussion forums. Furthermore, evidence from messages posted in post-test, showed that student participation increased dramatically. In the post-test the total student messages was 132 compared to 76 pre-test messages. This contradicts Grandon's (2006) report that active student participation only occurs when the discussion task is graded.

In this study, both the pre-test–post-test discussion tasks were graded and results showed high student participation can be achieved through sufficient teaching presence.

Another issue is whether the type of discussion question is related to higher levels of critical thinking. In this study, pre-test and post-test discussion questions were carefully framed so that both questions were of equal appetency to stimulate critical thinking. For example:

***Pre-test question:*** Assent of the head of state has no real significance in the legislative process and the enactment process of parliament should be sufficient.  
Do you agree? Why/why not?

***Post- test question:*** Parliament should not have the power to delegate its functions to other persons/bodies (subsidiary legislation) as it only encourage corruption and takes the power away from those who are elected to represent the people.  
Do you agree? Why/why not?

Consensus from prominent researchers in the field of critical thinking was gathered to ensure that both these questions could stimulate critical thinking. Professor Terry Anderson, Dr. Martha Cleveland-Innes, Dr. Elizabeth Murphy, and Professor Curtis Bonk confirmed that both questions were of higher order that has the potential to stimulate critical thinking. For example, T. Anderson (personal communication, June 10, 2009) said that

“I think your questions are great and likely to stimulate critical thinking. They have elements of interest and conflict - triggering potential. Certainly offer lots of opportunity for exploration in multiple media and contexts. They also stimulate integration as many diverse threads may need to be brought together in the form that allows resolution and application. So I think these are theoretically sound means to develop critical thinking as per Garrisons, Candy's and other models of critical thinking.”

Since both question had the ability to stimulate critical thinking, low frequency in all categories of critical thinking was observed during the pre-test and high frequency in all 4 categories of critical thinking was observed during the post-test. The only difference between pre-test and post-test was that the teaching presence was increased. Judging from this it is clear that teaching presence in a major determinate in moving students to achieve higher levels of critical thinking in asynchronous discussion forms.

To summarize, it was found that during both pre-test–post-test levels of critical thinking, triggering events and exploration had high frequency. The first phase of Practical Inquiry model, triggering events, had the highest frequency 36.8% in the pre-test and 56.1% in the post-test. This would seem to be reasonable, considering the discussion question was well framed and had elements of interest and conflict. The second phase, exploration, had the second highest frequency 30.1% in the pre-test and 55.3% in the post-test. This is also not surprising as the discussion question offered lots of opportunity for exploration in multiple media and contexts and it is consistent with previous research. However, the frequency of the responses dropped rapidly in the integration and resolution phases. Frequency in integration phase was 11.8% in the pre-test and 31.1% in the post-test and frequency in resolution phase was 6.6% in the pre-test and 25.6% in the post-test. Though, the questions had the capability to stimulate these phases, however lower frequency was observed. Perhaps because there was a need to bring many diverse threads together in the form that would allow resolution and application (T. Anderson, personal communication, June 10, 2009).

## Conclusion

The central hypothesis of this study was that if critical thinking is related to teaching presence, then exposing learners participating in the asynchronous discussion forums to high teaching presence will result in high level of critical thinking. In this study it was evident that when teaching presence was increased there was a significant increase in learners' level of critical thinking. Therefore, it is concluded that through increasing teaching presence students participating in asynchronous discussion forums can reach higher level of critical thinking.

It was also evident that learners were able to reflect their thoughts better with the guidance from the instructor. Therefore, instructors should send prompt replies to learners' to guide them to post high quality messages. This can be a motivating factor for students as it will give them the impression that the instructor checks each of their messages in detail. Moreover, discussion should include other features such as images, videos, animation rather than plain text. This will help students communicate their ideas easily and creatively. This is supported by Walker (2006) who found that integrating various learning styles in online discussion board encourage critical thinking.

This study in one way also tested the Community of Inquiry model for its robustness. The Community of Inquiry model can be used as a framework for future research in a quest to better understand the relationship between teaching presence and learners' level of critical thinking when using message as the unit of measurement for the computer mediated communication transcripts. In addition, in this study the Practical Inquiry model has proven successful at categorizing indicators for critical thinking, researchers should consider integrating this content analysis models with existing Learning Management Systems such as Moodle, and Blackboard because these applications already have rating systems.

The critical thinking achievement levels indicated that learners generally scored lower on integration and resolution category. According to T. Anderson (personal communication, June 10, 2009) there is a need to bring many diverse threads together in the form that would allow resolution and application. Probably one would ask how would this transfer to the practicality of

moving critical thinking to higher level in online asynchronous discussion forums, since online learning typically lasts between 7-14 days each, hardly enough time to bring diverse threads together. Richardson and Ice (2009, p. 21) suggested that “instructors should be looking to online discussions as a gauge, evidence of where students’ critical thinking levels are at a particular point in time, and then help them achieve the next level through additional scaffolding”.

While this paper provides promising evidence that through high teaching presence high levels of critical thinking can be achieved, there are limitations to this research. The major limitation of this research was that all data were gathered from undergraduate students at a single institution. Lulee (2008) explained that “every online discussion has its own unique context; the researchers often had to assess a wider range of subjects to infer meanings that presented the actual status”. Therefore, more experimental studies are needed to code multiple courses simultaneously to test the real effect of teaching presence on learners’ level of critical thinking.

Future studies may also examine the effects of teaching presence taking into consideration learners’ prior knowledge and understanding of the critical thinking concept, so that the question whether increased teaching presence does indeed directly increase learners’ level of critical thinking in asynchronous discussion forums can be answered.

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**Editor's Note:** This study examines context, process, and outcomes from meshing two contrasting cultures with a different primary language via the Internet. It broadens both curiosity and knowledge of students about other cultures, and initiates communication and building of relationships, and important step in living in the information age and a global society.

## Exploring Student Experiences of a Global Link: Recommendations for Future Programs

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### Abstract

In many universities within and outside of the USA, globalization has become a pervasive idea that has developed into an integral part of the educational agenda in the 21<sup>st</sup> century. Pressure on higher education to prepare students for global readiness and citizenship has promoted a shift of internationalization strategies, policies, and activities from a marginal to the “mainstreaming of internationalization” (Hahn, 2004, p. 123) in higher education. Purposes of this study were: a) present the essential steps used to develop “global link” and b) present the experiences of the students who participated in the global link. The global link was incorporated into one graduate distance education course through four stages: a) establishing partnership, b) pre-planning steps for global link, and c) activating global link, and d) assessing student experiences. Student responses were collected through questionnaires and interviews. Students characterized their experiences related to the benefits as themes of *Newness of Virtual Mobility*, and *Beginning of International Awareness*. The challenges of the experiences emerged as the themes *Innate Factors* and “*Technology is great when it works*”. This study also provides strategies and suggestions for developing effective global links in higher education.

**Key words:** Globalization, Internationalization, Global link, Higher education

### Introduction

Development of information technology and virtual mobility have contributed to the emergence of a global era that has required changes in multiple dimensions such as economy, education, politics, diplomacy, and even life-style (Mok, 2007; Scott, 2000). In many universities within and outside of the USA, globalization has become a pervasive idea that has developed into an integral part of the educational agenda in the 21<sup>st</sup> century. Numerous scholars have stressed that the effects of globalization on higher education have become major topics of discussion (Mok, 2007; Mok & James, 2005; Rouhani & Kishun, 2004), especially topics related to the pressures on universities to increase the global competence of their students. As described by Mok (2007) globalization has influenced “not only the way university curriculum is designed but also the way university research and management are organized” (p. 434). The term – *globalization* - can be interpreted several different ways, depending upon an individual country’s history, tradition, culture, and priorities (Knight, 2004). Even though there is no universal definition of globalization, most scholars agree that the term has a worldwide nature which reaches beyond the concept of a nation. For the purposes of the current study, globalization refers to the following general definition:

“the flow of technology, economy, knowledge, people, values, [and] ideas... across borders” (Knight & de Wit, 1997, p. 6).

“Globalization forces have accelerated the pace of internationalization of higher education...” (Mok, 2007, p. 435). As emphasized by Mok (2007), globalization challenges have influenced

universities throughout the world to expand and intensify “internationalization activities” (p. 435). Although increasingly used to discuss the international initiatives in higher education, internationalization is a term that has been used in a variety of ways over the past three decades (Knight, 2004). In the late 1980s, internationalization commonly referred to a set of activities at the institutional level. A well-known scholar in the field, Knight (2004), traced changes in interpretations of the term from a set of activities in higher education to a broader focus that encompasses education as a whole and its role in the 21st century. The following definition of internationalization serves as the foundation of the current study,

“the process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery of post-secondary education” (Knight, 2004, p. 11).

The inclusion of “international, intercultural, and global” in the definition reflect the increasing breadth of the term. Knight (2004) stressed that inclusion of the word “global” in the definition provided a sense of a worldwide perspective that is essential to denote the current expansion of the term, internationalization.

In the USA, universities have increasing demands from both national and state levels to promote global awareness. Pressure to prepare students for global readiness and citizenship has become a part of the central governmental agendas (Kienle, 2005). At the university system level, these pressures have promoted a “shift of internationalization strategies, policies, and activities from a marginal to a central issue in higher education institutions”, a shift described as the “mainstreaming of internationalization” (Hahn, 2004, p. 123). The University of North Carolina (UNC) system has been guided by the UNC Tomorrow Commission’s recommendations regarding “global readiness”. A major recommendation of the Commission was, “UNC (the system) should promote partnerships between its own campuses and international universities and enhance the global awareness of its faculty and students” (<http://www.nctomorrow.org/> accessed May 20, 2009)

To address the need to enhance global awareness, East Carolina University launched the Global Initiative Program (GIP) in 2003. The purpose of the GIP was to provide a relatively inexpensive way for students and faculty members to link with international partners (Fisher, 2009). Initially, ECU’s GIP faculty created two freshmen courses that provided opportunities to interact with students in three other countries. Within five years these courses developed into an integral part of ECU’s general-education curriculum. ECU’s model utilizes an array of on-line technology to communicate with students in over 18 countries. In 2008, ECU’s GIP was awarded Honorable Mention by the Institute of International Education (IIE) and will be one of the eight programs honored for Innovation in International Education at the United Nations in spring 2010.

Other ECU formats for internationalization of its curriculum include offering the same range of virtual technology in discipline specific courses. ECU faculty and partners in other countries in related areas can collaborate through video linking either part or an entire course. During 2008, ECU’s Department of Exercise and Sport Science (EXSS) faculty in teacher preparation, in conjunction with the ECU Global Initiative Program, began exploring ways to develop a “global classroom link” to be integrated into a graduate level distance education course. One EXSS faculty member spearheaded the development of a global link to be integrated into a graduate course that focused on “Professional Issues”. The process of developing this global link and the experiences of the students who participated in the link, are the focus of this paper. Specifically, the study’s purposes were: a) present the essential steps used to develop this “global link” and b) share the experiences of the students who participated in the global link.

The ECU faculty member was guided by her passion for providing international activities for her students. She implemented a four stage plan for the development of the global link. As presented in Figure 1, she implemented the following stages: a) establishing partnership, b) pre-planning

steps for global link, and c) activating global link, and d) assessing student experiences. Since the instructor was born in South Korea, she began establishing the partnership by contacting several faculty members of universities in South Korea. Contacting Korean faculty began by sending information packets which included inquiries about the level of interest in: a) teaching a graduate course with similar course topics and b) collaborating in development of a global link. The packet also included web-materials of ECU GIP and a description of the targeted course. One Korean faculty member agreed to collaborate in development of the global link and to integrate the link into one of his graduate courses, thus, establishing a partnership.

The pre-planning step for the global link required considerable communication between the instructors to discuss, test, and agree on the critical aspects of the link. For example, it was necessary for the instructors to address: a) appropriate course topics, b) feasible technology tools, and c) workable calendar. The following two course topics were selected: USA's Title IX and Teaching in Physical Education. Technology tools tested by the instructors included MSN, Skype and Centra to find the most convenient technology for both the US and Korean students. Centra: (<https://de207.centra.com/main/Customers/ecu/index.jhtml?default=true>) was chosen after several tests between the instructors and their students. Confirmation of a time schedule and organization of the global link were significant challenges for the instructors, but frequent discussions enabled them to develop a flexible and feasible plan.

Activating the global link was the heart of the experience. Korean and USA students met twice in small groups and in whole group formats. During these sessions, students presented and discussed course topics as well as student selected topics. Each presentation was followed by an open time to ask and answer questions. Primarily, all global link sessions were led by the students. Both instructors served as facilitators and addressed issues associated with technology, timing, and language differences. Text and video communication were available to all sessions.

Assessment of the global link was designed to gain understanding of the students' experiences in the global link. The assessment stage offered an opportunity to use a case study approach to explore the following research questions:

What were the benefits of the global link sessions for students who participated?

What were the challenges faced by students during the global link sessions?

## Method

A case study design was selected to collect "particularistic, descriptive, and heuristic" (Merriam, 1998, p. 29) information about the insights of students who participated in the global link. Students were invited to voluntarily participate in the assessment stage. A total of 20 students including 10 USA students and 10 Korean students participated. Permission to conduct the study from the university institutional review board (IRB) was obtained and participants consented in writing to participate.

Assessment of the students' experiences utilized: a) questionnaires prepared in English and translated into Korean and b) group interviews to collect in-depth of data. After participating in the global link component, participants were asked to complete questionnaires containing open-ended questions designed to elicit their experiences, both the challenges and benefits. The questionnaires were disseminated and collected via e-mail from all participants. A semi-structured face-to-face group interview was conducted in the Korean language to clarify questionnaire responses of Korean students and gain a deeper understanding of the data. The interview was audio-taped and transcribed verbatim. In addition, all data collected from Korean students (written and spoken in Korean) were translated into English. The interview transcripts were shared and corroborated with participants for member check via e-mail. Korean students

reviewed the translations and responded with limited and minor requests for corrections which were completed immediately and then returned to the Korean students for final agreement.

The questionnaire and interview data were analyzed using the content analysis in which words, phrases, expressions, or statements that are mentioned most often and that reflect the interest of research question were coded and categorized (Bazeley, 2003; Stemler, 2001). Worthiness of the data was established through peer review and debriefing, negative case analysis, and member checking. The authors of this study repeated reading the questionnaire data and interview transcripts independently to search for emerging themes and to complete peer review and debrief. Disconfirming evidence with the data was searched to find negative cases.

## Findings

This study assessed the experiences of students with emphasis on the benefits and challenges. Overall, the analysis of the data indicated that the Korean and USA students described similar experiences which emerged as four themes, two major themes corresponding to each research question. Students characterized their experiences related to the benefits as *Newness of Virtual Mobility*, and *Beginning of International Awareness*. The major themes associated with challenges were *Innate Factors* and “*Technology is great when it works*”.

The first major theme associated with the benefits, *Newness of Virtual Mobility*, included two subthemes: *Impact of Live Information* and *Amazingness*. Despite differences between the students, they repeatedly spoke of the newness of speaking *live* with international partners and portrayed their experiences as new, amazing, and infused with a feeling of openness. Combining their descriptions of amazement and openness resulted in the subtheme of “*Amazingness*”.

The experience of *live* interactions appeared to impress the students, especially when they compared this experience to reading or texting about the information with others. Using Centra software and web cams, the students were able to watch each other as they presented their ideas and questions to each other. Korean student responses which exemplified the impact of *live* exchange included the following: “I was able to build intimacy by having class with students who are far away. Also it was lively because there was a lot of sharing of information and I could feel the atmosphere of the class.” Another Korean student stated, “(The) benefit of this link is we can know each country’s live information.”

US students’ reflection on the impact of live interactions were exemplified by the following responses:

“When you think of online communication most people think email, but actually being able to see and talk to people in Korea was a big advantage in helping me learn new things.”

“The main benefit would be just the actual experience itself, being able to experience the lives of other people in the other countries across the world, and “I think this experience was beneficial because many students don’t have the opportunity to interact with students from another country and present information to each other. It was a wonderful way to gain firsthand knowledge from a student at the same level.”

The second subtheme of the *Newness of Virtual Mobility*, was “*Amazingness*”, an overall expression of a state of amazement and openness made available through technology. In fact, the technological experience itself was described by many students as a surprising opening of communication, “with students half way around the world”. Expressions of “*amazingness*” included the following responses from US students: “...it was cool to say I interacted with Korean students through computer technology at such a far distance.” and “This whole process was a wonderful experience and considering the distance between the US and Korea, and we

were able to communicate and see each other was really neat.” Korean student responses included the following: “It was surprising that I can communicate with new people on the web and can have conversations and discussions with students from other countries at the same time about the same topic” and “It was very interesting to be able to meet students in America through the lecture using video-chat...”. Frequently, openness was expressed as an exchange of ideas, as described by the following Korean student, “...interesting...good that we were doing it together with people who are on the other side of the Earth and the benefit was being able to interchange our thoughts.”

The second major theme associated with benefits, *Beginning of International Awareness*, included differences as well as commonalities. The students’ reflections on the course content often extended to areas of culture. Differences that related to common content and culture were noted by primarily Korean students, “Through this class I felt that the equality between genders is in urgent need in Korea, and I hope to keep introducing each other’s strong and weak points and through it recognize the importance of Physical Education and accomplish development.” “It’s experience, more than learning the culture. They’re free, different in appearance and body type, and new features or postures and etcetera.” US students noted awareness of differences exemplified by the following response: “I think this link broadened my knowledge of gender equity beyond the US. It was interesting to hear about gender equity in Korea. It would be interesting to compare what I know now to other countries’ gender equity views.

Commonalities between the countries were expressed primarily by the US students as expressed by the following responses.

It was also beneficial to know that they have some of the same problems we have here. The biggest problem they have is the same that we have in America and that is childhood obesity. I hear about how students in other countries are smarter than in America but I had not heard before that Korean students have a high level of obesity.

The purpose of the global link was to communicate with others outside of your country to broaden your experience and develop dialogue with people of a different culture and belief system. I thought this assignment allowed for the merging of two different cultures of people who share some similarities. The benefits of the global classroom are many. They include being able to participate in cross cultural communication, it allows universities to offer more educational opportunities.

Challenges faced by students during the global link sessions were addressed by the second research question. Two major themes emerged related to challenges, *Innate Factors* and “*Technology is great when it works*”. The first, *Innate Factors*, included two subthemes: *language differences and time differences*. In general, student responses associated with *Innate Factors* reflected the struggles which are inherent when communicating with other students who live, literally, across the world. Responses concerning the subtheme, language differences, were expressed frequently by students as frustrating as in the following comment from a Korean student, “...ECU students used shortened words of English that we could not understand” and “...challenging because we are not used to English”. And, as described by another Korean student, communication differences can be not only frustrating, but also boring. “People who are not very good at English could not understand right away and were not able to ask questions or give answers so it was frustrating and dull.” Responses of US students included, “I had to slow down my talking so the Korean students could understand what I was saying. I am sure my accent is also difficult... so this made it hard for the Korean students to understand.” Although perceived as a barrier, several US students were impressed by the language skills demonstrated by the Korean students as voiced in the following response:

...differences in languages served as a major barrier in completing this project. During the second link, I finally figured out the best way to attempt to communicate slowly and through the use of small words. I was very impressed with the ability of Korean students to understand and use the English language.

The second subtheme of *Innate Factors* was time differences. The significant time difference between the countries imposed difficulties on both Korean and US students in terms of work and family responsibilities. As described by one of the Korean students, “there were some restrictions in time because it was night-to-day and day-to-night, but the time difference could not be overcome.” As explained by one of the US students, “I had to either get up early or get on the computer (... I have to get ready for school in the morning) or stay up later (getting kids to bed and finishing off my other course work)...it was a challenge for me.”

The last major theme concerning challenges can be summarized in the phrase, “*Technology is great when it works.*” Although the instructors required practice times in which the technology was tested, technical difficulties were experienced by many of the students. The following student responses represent the heart of the challenges related to technical difficulties. This challenge was expressed by the US students in the following responses:

I personally didn't have any issues using Centra and I feel like I understood how to use Centra pretty well, but I did notice several problems that made it hard to communicate with others....Centra never sent me an invite to the class chat session one time, so I was unable to attend that chat because of that reason.

Many people's microphones and cameras would not work during the link. I think this made it difficult and unfair for people to have the opportunity to interact and ask verbal questions... Trying to get these features to work took a lot more time than it should have.

## Summary and Discussion

The purposes of this study were to present steps for development of a global link and to explore students' experiences during the global link. Four themes emerged from the students' responses. The first major theme, Newness of Virtual Mobility, indicated an excitement or state of “amazingness” in the process of meeting and speaking with international partners live. The students also expressed the theme of Beginning of International Awareness which included acknowledgement of commonalities and differences in the other country's academic system, culture, and professional issues. However, several challenges were identified. These included Innate Factors specifically, language and time differences. Though English is a second language for Korean students, all students in the global link were requested to communicate in English. At various times, it was difficult for both Korean and USA students to communicate because of language difference. It is important to note that many students quickly adapted the schedules to cope with the time differences and their speech by using text-chat tools to provide both spoken and written messages to their international partners. Another on-going challenge faced by students during the global link involved difficulties presented by technology. Although offering the avenue to experience a state of “amazingness” of interacting with students in another country, technology was also a powerful source of frustration. Hence, the theme, “Technology is great when it works”, may be more accurately stated as, “Technology is great... only when it works”. These findings indicated that technology was a key mechanism for virtual mobility, but also a potentially problematic and frustrating component of the global link.

To highlight the findings of this study, we review several approaches and rationales that drive internationalization in higher education in relation to the global link. Dewey and Duff (2009) introduced four categories of international activities in higher education; faculty research and teaching, curriculum, study abroad programs, and other areas of activity. The global link with an

international partner in a graduate distance education course is an example of teaching strategy that promotes international dimension in higher education. This link aimed to help students understand professional issues not only in USA and also in another country to promote global awareness. The instructor of the course designed and planned the global link based on establishing a partnership with one Korean instructor but implementation lacked institutional level of support. Nevertheless, the global link was implemented through the instructor's initiative, and this attempt contributed to the institution's internationalization effort. For example, Knight (2004) recognized general approaches to internationalization at the institutional level including activity, outcomes, rationales, process, at home, and abroad (cross-border). Integrating international dimension into teaching is one aspect of the process approaches to internationalization in higher education, which is defined as "a process where an international dimension is integrated into teaching, learning, and service functions of the institution" (Knight, 2004, p. 20). In addition, one of features of the global link was to provide virtual mobility for students to connect with other countries in distance education. This aspect of the global link is aligned with the delivery of cross-border approach to internationalization effort that "accentuates the linkage with other countries and focuses on the mobility of education across borders" (Knight, 2004, p. 21) through a variety of delivery modes including distance and e-learning. Thus, development of this global link demonstrates the power of one faculty member's effort to extend the range and volume of approaches to internationalization at institutional level.

Knight (2004) presented institutional-level of rationales that generally guide internationalization in higher education; international branding and profile, income generation, student and staff development, strategic alliances, and knowledge production. The global link occurred in a course of distance education program with limited relation to institutional-level of support. This fact directly highlights student development rationale with greater consequence as this study found because other rationales are more related to institutional level of activities and efforts. The student development rationale emphasizes the need of internationalization for enhancement of "international and intercultural understanding and skills for students" (Knight, 2004, p. 26). It is necessary for students to understand global issues, international/intercultural relationships, and technologies to live in a culturally diverse environment and respond to wisely the changing world. As a part of findings of this study, students were aware of commonalities and differences in academic system, culture, and issues faced in their professional area through the global link. In addition, utilizing technology to connect with international partners may provide students with opportunities to better understand and improve skills in communication technologies based on their expression associated with awareness of feasibility and inconvenience of technologies in this study. Though the global link results in a limited influence on internationalization, it is clear that students' learning and experiences through the link are consequence that devotes to the rationale for internationalization.

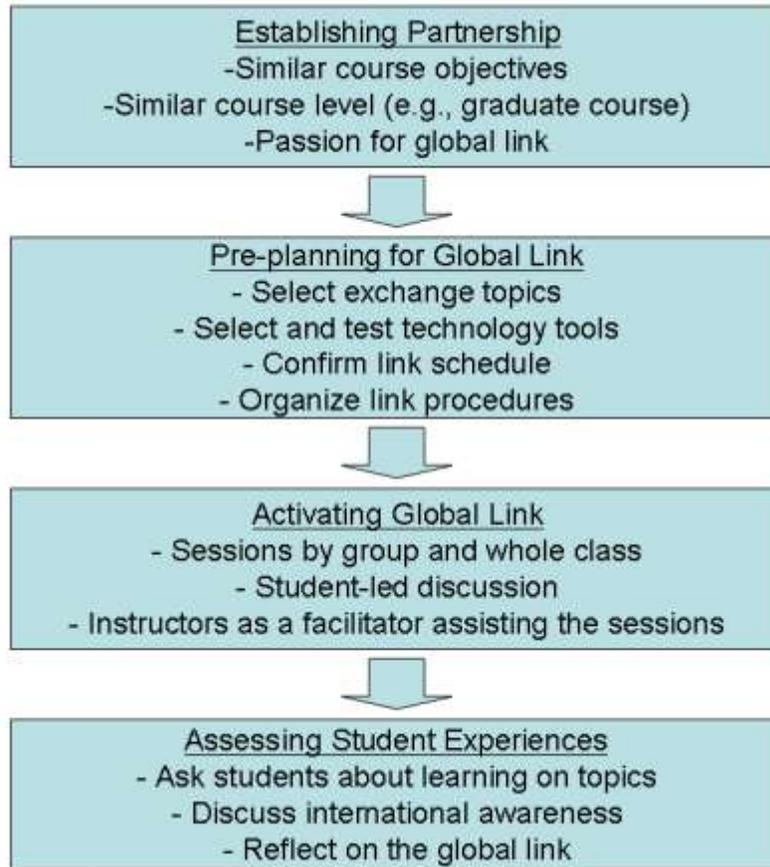
## **Implications for Future Programs**

Faculty interested in future global projects, may wish to examine the following strategies and suggestions for developing and incorporating a global link into a course in higher education. These suggestions are organized under the headings of the four stages presented in Figure 1: a) establishing partnership, b) pre-planning for global link, c) activating global link, and d) assessing student experiences.

### **Stage 1: Establishing Partnership** ***Passion for global link***

It is critical for both instructors to have a strong passion for developing the global link project. How much the instructor emphasizes the global link project impacts (but not limited to) the

weight of the evaluation in the course. The instructors' level of passion for engaging in the global link can inspire students to value the experience of connecting with students in another country.



**Figure 1. Procedure of preparation and implementation of global link.**

## **Stage 2: Pre-Planning Step for Global Link**

### ***Communication between instructors is critical for success of global link***

Sufficient communication between instructors is required to adequately plan and organize the link. Students can prepare for the global link only when the instructors announce the schedule in advance. If limited communication exists between instructors, students can waste their time by waiting on-line but failing to connect with their international partners. Accessibility for communication between the both instructors is essential for adequate planning.

### ***Development of a common calendar***

Agreement about scheduling is crucial for success. Countries use different academic calendars and holidays which can present major challenges. When students involved in the global link experienced significant time differences in this study. They were required to alter their daily plans dramatically.

### ***Adequate level of student information***

Instructors need to reach agreement about the amount of information that they are willing to share with their own students before the link regard to procedures and schedules. If the students have

different information and/or understanding about the link, this results in confusion and lack of interest in participation in the link.

### ***Evaluation***

The proportion of the global link in the course evaluation should be same or similar in both countries. Discrepancy in the proportion of the global link results in differences in the level of students' efforts and participation in the global link.

### ***Confirmation of Technology***

Technology training or pre-sessions for the technology tool are necessary to minimize technology problems during the global link. Technology tools should be selected that are convenient and feasible for students in both counties. Regardless of familiarity or newness of the tools, technology sessions are required to check individual items (e.g., mic, web-cam) and use of software programs.

### **Stage 3: Activating Global Link**

#### ***Increase of quality and quantity of the global link***

This is a critical issue that needs to be addressed more fully in future global links. Many of the students in this study reported the need for increased individual interactions with international partners and more of class-based global links. One of students in this study commented that "I feel that if we could have had a chat about their personal life in Korea, we would have been more comfortable asking questions about what our paper was about." Instructors can arrange partnering or small grouping for personal connections with international partners before formal class-based global links. Individualized interactions and more of global links will allow students to not only gain in-depth of understanding of another country (e.g., education system and culture) and global issues but also build individual relationships with their international partners.

### **Stage 4: Assessing Student Experiences**

#### ***Plan for pre-post assessment***

Instructors need to clearly articulate the goals of the link and plan for pre-post assessment of students learning and experiences in advance. In general, assessment in the current study focuses on students' learning outcomes related to the global links (e.g., global awareness and issues related to the course content, etc) and their reflections on their experiences. Utilizing the assessment results for refining the global link is essential for incorporating meaningful improvements.

### **Conclusion**

The results of this study indicated that individual faculty members who have a passion to increase global awareness can successfully expand international opportunities for students. Therefore, this study demonstrated the impact of down-up strategy on meeting the internationalization in higher education. The present study also emphasized that significant amounts of time for planning and implementation are required for developing meaningful international connections. As the pressures increase for higher education to intensify and expand international activities, there is a need to increase system-wide strategies and policies to support individual faculty initiatives.

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**Editor's Note:** This study shows how email communication was used to integrate multi-lingual part-time and full-time faculty from different cultures and backgrounds into a cohesive social learning organization.

## **Developing Collegiality and Collaboration among Teachers via Email Exchanges: A case Study from a Teacher Training College in Algeria**

**Hayat Messekher  
Algeria**

### **Abstract:**

This article presents a study of the effects of using email exchanges to develop collegiality and collaboration among teachers of English in a Teacher Training College in Algeria. A content analysis of the email exchanges the author, being head of the English department, had with her colleagues showed that Allport's Contact Hypothesis leads to promoting teachers' collegiality and professional development. When teachers were encouraged to use email exchanges with each other, they ended up bringing new ideas and propositions to the English Department where they were working. Fostering contact among English teachers via email exchanges served (1) breaking the ice between teachers, (2) generating reflective thinking, and (3) generating deeper analysis of the problems encountered.

### **Introduction**

In recent years, increasing attention has been given to the different applications and uses of Information and Communication Technology in language teaching in general and Internet and email technology in particular. For instance, currently the use of Internet and email technology by the language teacher is unquestionable (Fischer, 1999). Yet, although we are living in a digital era, many teachers do not have access to Internet and email in some academic institutions around the world and Algeria is no exception. Many studies looked at the attitudes teachers have vis-à-vis implementing Information and Communication Technology in the classroom (Chen, 2008) or the factors student teachers perceived were promoting or hindering the use of Information and Communication Technology in the classroom (Sime and Priestley, 2005). However, no study has looked at why teachers do not use even the basic Internet technology and which is email and how the use of email can help them build teacher collegiality via communication and collaboration between experienced and novice teachers so as to build a healthy atmosphere because teachers frequently work in isolation (Farrell, 2007) and far from each other.

Teaching is in essence a social activity at the heart of which is contact. The latter is often conceived of being mainly between the teacher and the students that we tend to forget the impact that the contact teachers have with each other and even with the administration can have on their pedagogical practices. One way to initiate and hopefully maintain contact is by using communication activities such as email exchanges. In this vein, email exchanges are seen as a mediating tool that teachers use to scaffold each other as novice and expert teachers. However, envisioning such an endeavor presupposes that teachers have access to the Internet. In reality, many teachers and teacher educators in the Algerian context do not have access to the Internet for many reasons. One primary reason is that Algerian higher education teachers are unfamiliar with the potential benefits of using email exchanges. Additionally, Algerian teachers' confidence in using technology, lack of accessibility of this technology in educational institutions, and lack of training and time, are considered to be the main barriers for implementing Information and Communication Technology in the Algerian context.

This paper, based on Allport's Contact Hypothesis, will investigate Algerian English teachers' use of email exchanges from the perspective of promoting teachers' collegiality and professional development. In other words, it will explore how teachers, when encouraged to use email exchanges with each other, ended up bringing new ideas and propositions to the English Department even though previously they had very little contact with each other.

From a professional development perspective, it is assumed that when teachers communicate with each other, share ideas related to the teaching methodologies they use in their classrooms, they co-construct knowledge. Thus, in this paper I will first provide the background and significance of this study in relation to the Algerian context. Next, I will provide the theoretical framework on which I based the study followed by the analysis of the recurrent patterns and consistencies that show the development of collegiality and collaboration between teachers. Finally, I will draw some pedagogical implications on the use of email exchanges to foster reflection as an alternative means for professional development followed by some concluding remarks.

## Background of the Study

### *An Overview of Teacher Education in Algeria*

In higher education in Algeria, there are two main types of institutions which are the University and the Ecole Normale Supérieure that is in charge of teacher training. The largest Ecole Normale Supérieure des Lettres et Sciences Humaines (henceforth, Teacher Training College for Letters and Humanities) is located in Algiers and consists of five departments, namely the Arabic, French, English, History and Philosophy Department. The English Department stands out because of the lack of English teacher educators. In order to compensate the shortage of English teacher educators, experienced high school English teachers are allowed to teach at a higher level such as the English Department in addition to teaching at high schools, often for financial purposes to join both ends of the month. The faculty members of the English Department for the 2007-2008 academic year were eight full-time English teacher educators all holding a MA degree in English with a specialization either in *Linguistics and English Language Teaching*, *Applied Linguistics*, *Philology*, *British Civilization*, or *African Literature* and two full-time holding a BA in English only. Four Arabic teacher educators also teach full-time in the English Department. They teach a number of psychology and pedagogy courses in Arabic because of the lack of English teachers in these specializations. In other words, instead of taking these courses in English, students take them in Arabic. Furthermore, having an annual students' population of around two hundred students for each of the first, second, third, fourth and fifth year, the English Department cannot function without those experienced English high school teachers. There are fifteen part-time high school teachers and eight part-time university teachers. Table 1. summarizes categories of the English Department's teachers for the 2007-2008 academic year.

**Table 1**

**Categories of the English Department's teachers for the 2007-2008 academic year**

	Full-time (14)	Part-time (23)
Holding an MA in English	8	8
Holding an BA in English	2	15
Holding an MA in Arabic	4	-----

The dynamics and power relations between all the teachers are worth considering. The first distinction that is usually made is between full-time and part-time teachers. The English teachers holding a M.A. degree as well as the Arabic teachers are full-time and have a particular and

higher status at the college compared to the experienced English high school teachers or other university teachers having a M.A. degree in English but who serve as part-time teachers. Interaction between them is minimal, especially the high school teachers who lack the theoretical knowledge of the full-time English teachers. The second interesting power relationship is between the full-time English teachers and Arabic teachers who despite the fact that they all hold a M.A. degree and are full-time do not have equal weight in the decision making process of the department. The English teachers feel in control of power because they teach English in an English Department while the Arabic teachers feel marginalized because they teach in Arabic in an English Department and do not speak the language of specialization. However, because of the language planning policy in Algeria that values Arabicization policy (i.e., the exclusive use of Arabic as the official language of administration and instruction), the Arabic teachers have more power on a political level (for a thorough discussion of the language situation in Algeria, c.f. Benrabah, 2007). This said, it is clear that teacher collegiality at the Teacher Training College has not been developed and barely exists.

Being conscious of all the dynamics of the teachers' relationship in the department and being myself a teacher with them and Head of the English Department, I set as an objective to promote teacher collegiality among all the teachers of the English Department by fostering communication between them via email. I basically based all my communication with them on email exchanges, and urged them to respond by email. However, I did consider *a priori* the place of technology in this particular context.

### ***The Place of Technology in Algiers' Teacher Training College***

In Algeria, technology is not part of the society's culture at large, let alone the school culture. However, as a developing country, the Algerian Ministry of Higher Education and Scientific Research has installed labs equipped with computers and connected to the internet in all the institutions of higher education. In the Teacher Training College, for instance, one lab is reserved for graduate and undergraduate students; and another one for teachers and teacher educators with daily free access. However, using Internet technology by many teachers and teacher educators has not been a common practice because of many barriers to which I will come back later in this paper. Besides, although the first use of Internet technology we may think of is email, many Algerian English teachers and teacher educators even by 2007 did not have an email account or, if they had one, did not use it regularly for many reasons. The first reason teachers and teacher educators, not only English ones, put forward is lack of access to the Internet. Many of them either did not possess a computer or, if they did, were not connected to the Internet. The connection fees were far beyond their reach and even the quality of the Internet connection was not that good. It is worth noting however that during 2008-2009, the Ministry of Telecommunications has launched a program whereby each family was supposed to acquire a laptop and an Internet connection via financing. This ambitious program was not very successful for a multitude of reasons which are beyond the scope of this paper. As such then, English teachers and teacher educators in the English Department, except a few, did not have much access to Internet and hence were not accustomed to use email.

### ***Significance of the study***

In this study I shall analyze the content of the email exchanges I had as Head of the English Department with my colleagues, i.e. all the teacher educators who have responded to my emails in order to investigate how emails are used and what functions they fulfill. I selected this college because of my affiliation to it on the one hand, and because of my five years varied experience there in teaching, and in pedagogical and administrative responsibilities. I have noticed that English teacher educators like many other teachers have usually been socialized in isolation. Ferrell (2007) states that:

Since the day they started to teach, teachers have been socialized to work in isolation from their colleagues and this has led to feelings of insecurity because teachers may be afraid to share their experiences with other teachers for fear of being 'exposed'. (p. 120)

On the one hand, no institutional professional development is offered to them, and on the other hand they did not for one reason or another develop professional spaces for themselves even virtually to collaborate in as a community of practice (Wenger, 1998). I strongly believed that we needed "to break out of the shells of isolation separating teachers from their colleagues as well as from teacher educators" (Oprandy, Golden and Shiomi, 1999, p. 152). I am referring to both teachers and teacher educators because the latter are full-time and the former are part-time and are either experienced English secondary school teachers or University teachers serving in other institutions. They occasionally meet at the college given that they teach only six hours a week there. Although they have to report to the Head of the Department, they can terminate their contract without previous notice because there is no clause in their part-time contract that makes them liable to the college's administration. They do not feel as responsible to the college as they do to their primary institutions and frequently stay at the periphery of everything that is happening at the department even if it has a direct incidence on their pedagogical practices. Communication between the faculty members was not always fluid. There were many power relation issues involved that made collaboration hard to achieve. Without communication, or with poor communication, access to information is delayed or denied. Email exchanges were one means to keep communication ongoing, imparting the seeds for a prospective collaboration especially if teacher educators are welcomed to use emails exchanges as a channel for receiving information, asking for feedback, or proposing any ideas that could enhance the pedagogical practices of the English Department.

Baylor and Ritchie (2002, p. 398) argue that "regardless of the amount of technology and its sophistication, technology will not be used unless faculty members have the skills, knowledge and attitudes necessary to infuse it into the curriculum". When I was appointed Head of the English Department, I planned to break this isolation by driving all the teachers to use email exchanges as a means of communication to be informed of what is going on administratively, and more important, pedagogically. Performing the role of administrator made me feel the urgency of having a well-functioning department that ensures good teaching and training. However, having been myself a teacher and continuing to teach while I was holding this administrative position made me reflect on what process can lead to this end-product. Surely, email is the most used Internet application but its purpose goes well beyond communicating. The study of Bowman, Boyle, Greenstone, Herndon, and Valente (2000) showed that networking using email between teachers was not only conducive to collaboration but it gave teachers an opportunity for professional development. They found that teachers in the group, i.e. "ingroup" members, gained "a rich treasury of teaching ideas through the responses of group members to [their] own and others' questions" which helped them solve many of the problems they were facing in their teaching. A participant teacher in their study reported on the use of email stating that:

Through sharing our challenges with understanding colleagues and receiving advice and support, we find ourselves no longer merely struggling with teaching problems, but facing exciting professional challenges with renewed energy and optimism. (Bowman et al., 2000, p. 18)

Many studies showed the advantages of using email exchanges in teaching both for distance education and for traditional classroom-based instruction (Huang, 2001). Other studies looked at the use of email between students and instructors (Hassini, 2006), while no study dealt with the use of email between colleague teachers, particularly in the Algerian context. As a matter of fact, in this study I will be looking at how email exchanges are used between colleague teachers and what purposes they fulfill. Do email exchanges lead to more collegiality and collaboration

between novice and experienced teachers? In other words, the underlying belief of this study is that getting teachers to communicate with each other using email exchanges will help them develop collegiality, collaborate and co-construct knowledge together in order to promote a healthy environment for teaching and learning.

## **Theoretical framework**

### ***The ‘contact hypothesis’: The original model***

In the field of social psychology, Allport (1954) was the first one to propose the ‘contact hypothesis’ which has later been taken over and elaborated by other scholars. The “contact hypothesis” is also known as Intergroup Contact Theory. It states that under appropriate conditions interpersonal contact reduces interracial prejudice between majority and minority group members and enhances tolerance. In other words, the ‘contact hypothesis’ accounts for the nature and impact of contact between intergroup members, i.e. members of a particular group may have with each other and with outgroup members that do not belong to their group. Allport (1954) argued that contact between members of opposing groups can have a positive impact on their feelings and behavior if optimal conditions for successful contact are provided. These optimal conditions are program support by authority, although it is important that group members volunteer; equal status of participants such as role assignments; cooperation between members across groups; and individualized contact between group members that may lead to and develop friendships. Furthermore, Stephan and Stephan (1984) were more explicit in detailing the benefits of intergroup interaction which can only take place when contact happens between the group members. Stephen and Stephen (1984) argue that, thanks to the information exchange that happens between the group members, intergroup anxiety is lowered and a better understanding of outgroup members is gained.

### ***Adaptation of the ‘contact hypothesis’ model:***

I adjusted the original ‘contact hypothesis’ so to satisfy the goal of my study. First, I considered groups not as a large social group representing a particular race or ethnicity, but as a group of professionals working together in the same institution, assigned the same role, but having unequal official status that replaces the racial or ethnic difference in Allport’s original. Second, I narrowed the concept of contact since I conceive of it as contact between teachers within two subgroups which are the group of full-time English teachers and part-time English secondary school teachers and not as contact between different ethnic groups. The optimal conditions for the modified version of the ‘contact hypothesis’ are institutional support represented by me as Head of the English Department inviting teachers to use email for their daily professional communication and communicating with them by email. Equal status was ensured by involving all the teachers whether they are full-time or part-time, English teachers or Arabic teachers, holding a M.A. degree or a B.A. degree, as long as they are assigned the same role which is teaching in the English Department. Cooperation between teachers was the focus of using email for communication. Some individual friendships already existed because many teachers taught together for many years in the same institution or studied together at the university. I believed this was an element that has to be exploited in assigning teachers to help other novice teachers.

Crisp and Turner (2009) elaborated the Contact Hypothesis original model and proposed a framework for imagined interactions in a simulated social contact. They reported results of empirical research that support their claim that imagining interactions between group members can yield to more positive perceptions. This is another venue to investigate for future studies in the Algerian context but instead of relying exclusively on purely imagined contact, we can opt for more virtual contact using different kinds of electronic communications such as social networks, blogs and wikis. Having discussed those hypotheses, it should be noted that there are some

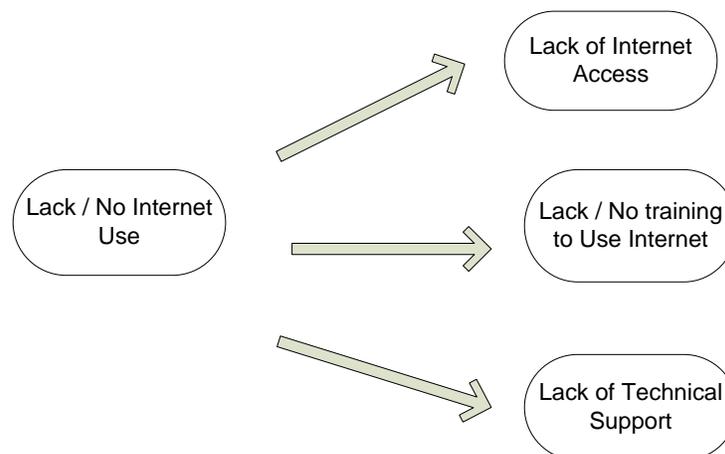
barriers to the use of email technology in the Algerian context to which I will turn in the next section.

***Barriers to using Internet and Communication Technology and email exchange:***

In a review of the research literature on barriers to the uptake of Information and Communication Technology by teachers in England, the British Educational Communications and Technology Agency (BECTA, 2004) summed up the actual and perceived barriers by teachers as follows. First, teachers' "level of confidence in using the technology"; second, "there is a close relationship between levels of confidence and many other issues which themselves can be considered as barriers to Information and Communication Technology. For example, levels of confidence and therefore levels of Information and Communication Technology use are directly affected by the amount of personal access to Information and Communication Technology that a teacher has". Third, level of use of Information and Communication Technology is related to level of access to it although appropriate organization, even of limited access, is important to secure access to all users. Fourth, teachers' use of Information and Communication Technology is also related to inappropriate training, lack of time, or technical IT support. In addition to teachers' resistance to change, Becta (2004) reports teachers not realizing the advantages of using technology, age and gender which I personally think are not of much significant. We should keep in mind that there is no clear distinction how barriers influence each other and overlap.

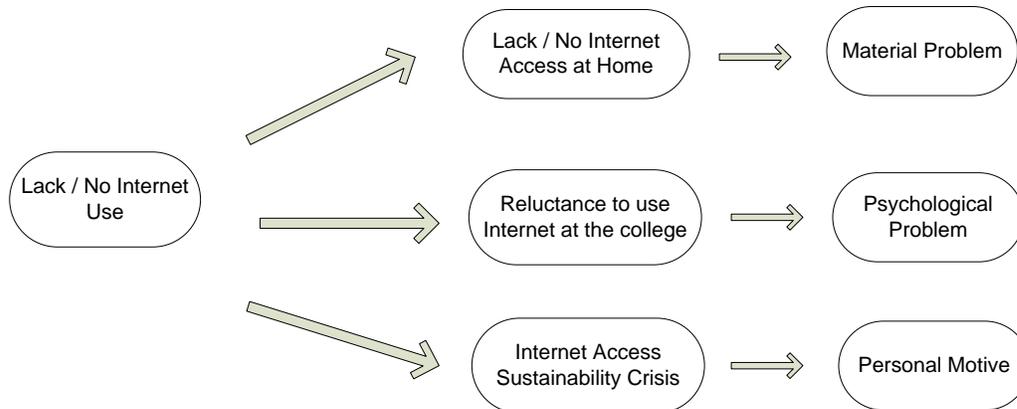
Cuban (1993) identifies first- and second-order barriers to change that are faced by teachers. The first-order barriers are internal and intrinsic to the teacher and the second-order barriers are external and extrinsic to the teacher. Other studies focused on the success of using Information and Communication Technology tools in academic settings (Ilomaki and Lakkala, 2004). However, in Algeria we are lagging behind for two main reasons. I refer primarily to the Algiers' Teacher Training College in the Humanities and Social Sciences, but this situation applies to other academic institutional contexts where these barriers are first, access to and availability of Information and Communication Technology, and second, judicious and optimal use of it because of lack of knowledge or training to use it.

In the context of this study, the barriers teachers face in using Information and Communication Technology and more specifically email are first-order barriers that are external. These are mainly lack of access to technology, lack of training to master or to use technology, and / or lack of technical support. These barriers can be considered mostly institutionally related in case the teacher relies exclusively on the college to have access to the Internet. Figure 1 summarizes these first-order barriers to use the Internet.



**Figure 1. First-order barriers to use the Internet.**

Second-order barriers to using the Internet are related to the teacher (herself/himself). First, the teacher may not have access to the Internet at home either because the subscription fee is expensive or does not have a landline at home. These are material problems. Second, the teacher might be reluctant to use the Internet at the college because the teacher is not comfortable asking IT technicians or colleagues in the computer lab for help. Third, the teacher may not be motivated to keep using the Internet. In other words, there is a kind of internet use sustainability crisis whereby the teacher uses the Internet occasionally and fail to keep using it as a tool and resource for teaching because they fail to realize how useful email technology can be in second language teaching (Huang, 2001). Figure 2 summarizes the second-order barriers to use the Internet.



**Figure 2. Second-order barriers to use the Internet.**

Despite the above mentioned barriers, one has to keep in mind that email technology is principally a communication technology and that when face-to-face communication fails for one reason or another, communicating by email can be a remedy for such inhibition or uneasiness in communicating face-to-face. In other words, email exchanges can create the contact that we fail to have in face-to-face encounters.

Hence, this study seeks to make a content analysis of the email exchanges, mainly the topics discussed and the purposes they fulfill for both teachers and teacher educators across a period of six months. Two basic research questions guide this study:

1. Do email exchanges between teacher educators lead to more contact and promote teacher collegiality?
2. What purposes do email exchanges fulfill?

## The Study

### Participants

The participants of the current study were all Algerian English teacher educators working in the English Department of the Teacher Training College of Algiers as full-time or part-time teachers or experienced high school English teachers who work there as part-time teachers under a contract. It is worth mentioning here that all the email exchanges I had with the faculty members of the English Department were used as data that make the basis of this study. I used email exchanges with most teachers to varying degrees, depending on how much access they had to the Internet, except one teacher who did not use email and Internet. She was somehow “technophobic”. Thus, the total number of participants in this study is thirty-six unless otherwise mentioned.

It is also worth noting that these teachers were not accustomed to use email for their professional and even personal communication. When this study was conducted, I was serving as an English teacher educator and Head of the English Department. I encouraged and pushed my colleague teachers to use email to communicate. The content of these email exchanges are analyzed in the scope of this study except those dealing with personal issues. For instance, I can count how many emails were sent to report on an illness, but not what type of illness it was.

***Instrument: Email exchanges***

The first step in this study was making an inventory of teachers' access to Information and Communication Technology. Table 2 summarizes the baseline data of this inventory.

**Table 2**  
**Teachers' access to Information and Communication Technology**

	Full-time English teachers (13)	Part-time English teachers (23)
Own a computer	13	10
Have internet at home	5	8
Possess an email account	10	8
Use email	5	4

All the full-time English teachers possess a computer at home and have an email account except one. However, less than half of the total teachers have Internet connection at home and use email to communicate occasionally except 2 who use it on a daily basis. Further, of the 23 part-time English teachers, 10 possessed a computer at home and only 8 had internet access at home. However, while 8 possess an email account, only 4 occasionally use it. The second step was asking and assisting all teachers to create an email account, and to urge them to use it for professional communication with the department so as to save time. Teachers were also encouraged to use the computer lab that was next door to the English department. During the first month, 10 full-time English teachers were using their already existing or newly created email account. For the part-time teachers, we moved from occasional use by 4 teachers to 13.

The email exchanges I had as Head of the English Department with my full-time and part-time colleague teachers were used as data for this study. Other emails they exchanged between each other and where they copied me over a six months period were also analyzed. Most email exchanges were informative or descriptive of the actions I took on an administrative level such as program changes, scheduling exams, conferences, guest speaker talks, visits of officials from British Council Algeria or the U.S. Embassy Education and Cultural Officer, assigning one full-time experienced English teacher to make sure the part-time secondary teachers who taught the same course as s/he does stick to the department's overall program, or any other actions I intended to take or simply proposed to my colleague teachers for feedback and / or prospective amendments because I wanted to cultivate an interactional management of the English Department.

Table 3 summarizes the total number of email exchanges and the purposes of the communication.

***Data analysis***

The email exchanges I had with my colleague English teachers were further analyzed. In other words, I looked closely at the emails I received as a reply to the emails I sent in each category and analyzed how many were a mere answer to my topic and how many contained subject matters that were not part of the original email I sent. Often, teachers replied to my emails making new propositions I was not expecting. For instance, in a reply to an invitation for a guest-speaker's

talk, they would invite colleagues to another talk offered in another institution that tackles another topic that is completely different from the one I invited them to but which is still relevant to our specialization. As such then, other teachers frequently had to attend events in other institutions of higher education that I believe was an alternative for the professional development they could not have at the college. Table 4 shows the total number of emails teachers sent me and which was either a reply to the content of my email or proposing something completely new.

**Table 3**  
**Total amount and categories of emails exchanged**

Purpose of the Email	Number of emails I sent out (1398)	Number sent by teachers (896)
Program change	200	60
Exam schedule	180	55
Conference announcement	54	60
Guest-speaker talk	253	160
Official visit	20	7
Coordinating courses	69	70
Graduate program proposal	50	45
National educational program reform	45	60
Greetings on special occasions	138	189
External projects	69	30
Invitations to propose changes in in the Department	320	160

**Table 4**  
**Total amount of emails teachers sent as a mere reply or containing new items**

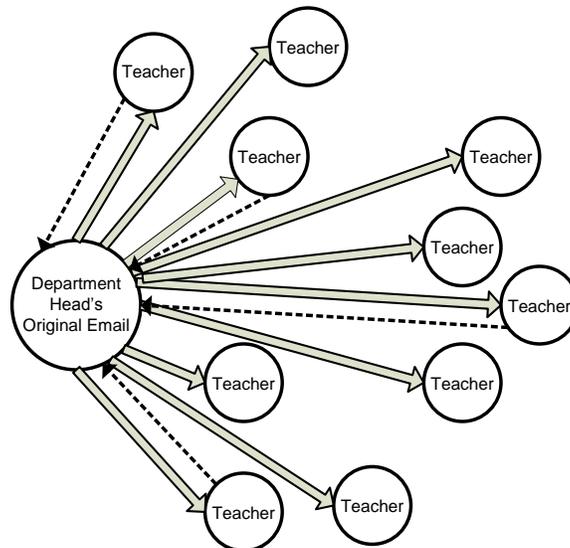
	Emails teachers sent as a mere reply (455)	Emails teachers sent with new items (386)
Program change	20	40
Exam schedule	40	15
Conference announcement	25	35
Guest-speaker talk	85	75
Official visit	6	1
Coordinating courses	20	50
Graduate program proposal	10	35
National educational program reforms	5	55
Greetings on special occasions	179	10
External projects	10	20
Proposing changes in the Department	55	105

During the six months period, a total of 55 emails teachers sent were disregarded because they were personal emails whereby teachers either sent some jokes or wrote about personal issues that

had no direct incidence on their teaching and were mostly related to their private life. For ethical reasons, I disregarded them given the fact that they requested me prior to the study not to disclose any of their emails of a private nature. 15 emails were explaining personal problems related to their health conditions or private life which caused them either to be late for their classes or be absent.

## Results and Discussion

The content analysis of the email exchanged revealed that the majority of the emails have been initiated by the Head of the Department. This is an expected finding given the fact that I intended to encourage my colleague teachers to use email and as such then had to use it extensively. Nearly half of the emails (45.89%) my colleague teachers sent to me and other colleagues were because they usually copy all the teachers on their emails. This clearly shows that they were using emails in a generative way. As such I personally think that a traditional and generative model of email exchanges can best illustrate this change of behavior in using emails. Figure 3 and 4 show clearly the results of this study in two proposed models.

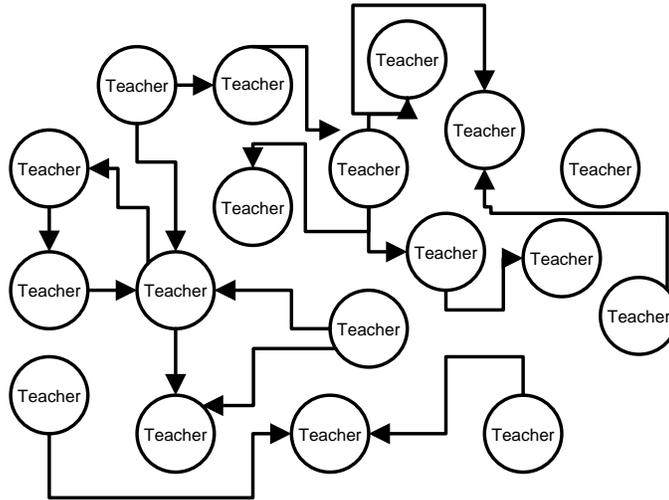


**Figure 3. A traditional model of email exchanges.**

In figure 3, the arrows originating from the teachers represent the replies they send and which were, for instance, either a consent that they agree to adhere to the program changes in terms of changing a course's content or reorienting it to fit the needs of students. For exam schedules they had to acknowledge receipt of their respective schedules to invigilate the exams and, by the same token, commit themselves to invigilate. For conference announcements and guest-speaker talks, they usually reply by confirming attendance or apologizing. As far as coordinating courses, proposing reforms of the programs and external projects, they generally request further clarifications. However, for religious and national celebrations only a few would respond because they generally do not access the Internet during such occasions because of their social commitments especially for religious feasts.

Figure 4, on the other hand shows clearly how teachers took the initiative to email each other and how the original sent email had an activating effect on them. For instance, for almost all the categories of emails exchanged (i.e. program change, exam schedule, conference announcement, guest-speaker talk, official visit, coordinating courses, graduate program proposal, national educational programs reforms, external projects, and proposing changes in the Department), they

replied with more emails that made further propositions, more thoughtful reflections, deep analyses that reflect their expertise in the field, relating their personal lived experiences as former language learners and present language teachers, and sharing the teaching materials they used or created and which were successful with their students. In what follows, I will report on three rubrics that were recurrent and consistent in their email exchanges and use some emails that I randomly selected from the pool of emails in each category. I used pseudonyms for the sake of confidentiality.



**Figure 4. A generative model of email exchanges.**

***Breaking the ice:***

These were emails exchanged in a friendly tone. They were meant to introduce oneself to each other. Below is a sample.

Dear Lydia,

I'm Sara from Elbiar High School. I'm teaching two groups a writing course. I'd like to meet with you so that we can know each other and maybe work the syllabus together.

Take care and see you very soon. (Raja, email dated 01/6/2008)

In fact, such friendly emails were very common, especially at the beginning of the semester, and at religious feasts and during holidays.

***Reflective thinking:***

This email was sent as a reply to a previously sent email where I raised the problem we had at the English department with respect to the low performance of freshman students in the writing course. A colleague wrote:

Dear All,

You know what; I was thinking why don't we arrange something like having fourth and fifth year students helping the first and second year students in the writing classes. (Lamia, email dated 02/28/2008)

In fact, this email from a full-time teacher suggests that she thought over the idea I raised and responded in a very creative way. In the Algerian context, we do not have the idea of peer-

tutoring. Her email is valuable in the sense that she is proposing a new, innovative way to deal with the poor performance of the students.

In another email, I found a high school teacher proposing to share a new in a course taught by a full-time teacher. She used project based learning (PBL) successfully in her high school and thinks using PBL will be useful in the methodology class.

Hi,

Thanks, glad to hear that. In fact, I've been working on a project with my colleagues in the lycee. I'll bring the project to class next week and I think you can just do the same thing with your students in the Methodology class.

(Salim, 03/14/2008)

### ***Deep analysis***

In this excerpt of an email sent by a full-time teacher, she analyses the real reasons for a student's poor performance in writing.

Dear All,

I think we are turning in a vicious circle. I believe that our students' writing skills will never improve if we continue to teach this way. You should know that the fact that they take 3 to 4 classes in Arabic and that the grades they got in these courses count in the average means, they can still have very poor grades in grammar and writing and pass. I think we should not include the grades of the Arabic classes but just consider them as a pre-requisite. (Lynda, 05/20/2008)

Indeed, the proposition this teacher made was considered further in a national seminar to revise the courses we taught as part of English initial teacher education.

Hence, experienced high school teachers had a wealth of knowledge to share and to add to the theoretical component that teacher educators possessed. This is a very important contribution because most full-time English teachers holding a M.A. degree never taught in a high school or junior high teacher and thus lack a practical aspect that was brought to them thanks to the contact created and generated by email exchanges with the English high school teachers. The prejudice, animosity, and apprehension the different teachers had vis-à-vis with each other were overcome thanks to the emails they exchanged with each other.

### **Limitations and Implications of the Study**

The present study investigated the change in behavior of teachers' purposes in using email exchanges. It more specifically looked at whether or not email exchanges will create more contact between teachers and help them promote more collaboration and knowledge co-construction. The method of content analysis used has proved to elicit meaningful data that helped in answering the questions I set forth to answer. However, although the results of the present study are important as a first exploratory attempt in investigating the use of Information and Communication Technology by Algerian English teacher trainers, namely email technology, it would have been more judicious to use triangulation of data by using a follow up questionnaire or interviews to gain further and deeper insights into the teachers reflections about the use of email exchanges. Hence, I think that follow-up studies are necessary. First, further studies can look at the use of other Information and Communication Technology such as blogs. Second, future studies should investigate teachers' initiatives in using these technologies for their own professional development and then with their student teachers given that the context of the study is a teacher training college. Finally, it can even be useful and sound to replicate the same studies with the

student teachers as English teachers to be and investigate what uses they can do with technology because they tend to be more accustomed to Information and Communication Technology.

Additionally, another important aspect that was revealed from this study is the need to offer a technology seminar for teachers in order to get them to use technology. Teachers, frequently argue that they do not use technology because they have not mastered it. Hence, seminars in the use of technology in teaching will be designed depending on the number and needs of teachers. Furthermore, it is also recommended to incorporate a technology course in the curriculum for teacher training. This way, even the student teachers will be better equipped to use technology in their future practice.

## Conclusion

This study revealed that the email exchanges between a cohort of English teachers and teacher educators in a Teacher Training College in Algeria have created a functioning teaching and monitoring network. The most important outcome of such exchanges is the creation of a virtual community that created more contact between them and facilitated communication and exchange. The generative dynamic character of the emails they sent each other helped in creating a healthy atmosphere that was conducive to more collaboration between experienced and novice teachers and revealed that teachers, whether they deal with theory or practice, have a lot to share with each other and to contribute to build knowledge. In other words, no matter where the teacher stands, no matter what his credentials are, all teachers can come together and co-construct knowledge with each other. In this line of thought then, it is legitimate to consider such email exchanges as a virtual ongoing training component in which teachers were constantly encouraged to share their practical experiences and professional challenges inside and outside the classroom and to help their colleagues to benefit from them.

Finally, it is worth noting that the research questions I posed in this study were: do email exchanges between teacher educators lead to more contact that promotes teacher collegiality? And what purposes do email exchanges fulfill? And that by attempting to answer these questions, I wanted to contribute to the discussion revolving around the use of Information and Communication Technology in language teaching. The answer I reached is that using email technology creates a venue for teachers to communicate with each other, to develop professionally, and to mentor each other. Further research may be needed to check whether the collegiality and collaboration these teachers developed was sustained or not.

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## About the Author

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**Editor's Note:** In her October 2009 article, Ms Kok showed how Wikis relate to and expand upon Piaget's theories and their application in knowledge acquisition. In this article she explores the value of Wikis for knowledge development and sharing in collaborative partnerships for local and distant communities.

## Use of the Wiki Technology in Academic Partnerships

Ayşe Kok  
Turkey/UK

### Abstract

The development of new technologies is giving rise to new models of collaboration. One of these models is "Mass Collaboration" that is based on Web 2.0 technologies and services. Within this context, wikis offer new possibilities to exploit in a more effective way the entire potential of the collaborative work coming from the active participation of all the individuals that are present in dispersed locations. This research study wants to contribute to the current debate on the cultural shift that the introduction of this tool in academic partnerships with even the less developed countries is able to produce.

### Background

Due to the rapid proliferation of information and communication technologies (ICTs), complexity - which is the nature of things today - has been greatly increased. In order to manage interdependence, we have to work cooperatively with others to share same interests, skills and knowledge. Thoughtful changes in the nature of technology and global economy are giving rise to new powerful models of collaboration. These new collaboration models are based on community and self-organizing, derived from the technological and internet revolution and the Web 2.0 technologies and services that create a new sense of innovation, creativity and ingenuity.

Mass collaboration is a collaboration model based on collective actions that occur when large numbers of contributors work independently but collaboratively in a single project (Tapscott & Williams, 2006). Such projects typically take place in the internet via means of web-based collaboration tools. This model of collaboration unleashes the creativity, innovation and knowledge of individuals worldwide by fostering knowledge-sharing. What distinguishes "Mass Collaboration" from other forms of collaboration is that the content that is being created in "Mass Collaboration", rather than the social interaction, mediates the collaborative process (Tapscott & Williams, 2006). Furthermore, individuals willing to participate in creative acts require the joint development of shared understandings.

The International Education Consultancy Office within the University of the Arts in London is one of such institution. It tries to use mass collaboration (based on partnerships established in various developing countries such as Syria, Bangladesh and Turkey) to promote development of the textile industry in these countries by providing voluntary education through projects funded by UNIDO (United Nations Industrial Development Organisation) and the EU (European Union). The researcher's interest in this case study is due mainly to being from one of these countries, Turkey, in which the newly established institute, Textile Academy, in partnership with International Education Consultancy Office, is seen as central to reviving the textile sector hit by economic crises.

The researcher tries to investigate whether the use of these collaborative technologies can further contribute to the knowledge transfer between such academic partnerships.

## Definition

Wiki is the most representative tool that enables the new Web 2.0 philosophy that is defined by user participation, openness and network effects. Derived from the Hawaiian word of “wiki wiki” which means *quick*, this social software is an enabler of social interaction, collaboration and information sharing, promoting the growth of communities as user groups. In order to clarify what wiki publishing is a synoptic table of comparison has been provided (Klobas, J., 2006)

Table 1 – As Quick as a Wiki: Comparison of steps needed for the creation of wiki page and web pages. (Klobas, J. 2006)

Wiki Page	Web Page
1 Go to the page on web browser	Search your Web editor preferred (Dreamweaver, Frontpage...)
2 Click on Edit	Open locally the web page (off-line)
3 Make changes in page	Open the source file
4 Save the page	Make modifications
5	Save the file
6	Transfer the file on the web-server (FTP)
7	Open the browser
8	Check the edited page on the browser

The application of the wiki in the academic partnership projects can be the object of a taxonomy following these dimensions:

- **Support to effectiveness:** This refers to the access of information such as phone numbers or suppliers address. Wiki can be useful to collect and self-update the users’ index or other descriptive section.
- **Knowledge and collaborative support:** This refers to collaboration inside and among teams and the related knowledge management issues. Wikis are used in this sense for many applications, from the creation and the implementation of the common knowledge base to the several applications that requires the matching of many experience (e.g.: co-creation of procedures, handbooks, plans, activities, schedules, sharing presentation materials...etc.)
- **Communication and socialization:** This refers to development of networked internal communication as well as institutional and intrapersonal. Users are connected using Wiki in order to join the owner of a particular competence or knowledge or real time collaboration with other related parties.

As McMullin (2005) and other social constructivist theorists assert; because of their flexible functionality, wikis afford the opportunity to offer collaborative, constructive learning more extensively by shaping knowledge through discussion with peers and through reflection. Due to the collaborative nature of wikis knowledge is enacted with a focus on the community rather than on the individual learner (McMullin, B., 2005).

Similarly, according to the theory of the community of practice, learning is an inherently social activity, situated in a social and cultural context (Lave, J. & Wenger, E., 1991). So, in order for learning to occur, there must be a negotiation between an individual's unique experience and the knowledge of the group. The community provides a ground for interaction and so that learners can collaboratively construct shared knowledge (Palloff, R.M. & Pratt, K., 2005).

Wikis are web sites that allow users not only to have access to its content but also to change the content online. As Scardamalia & Bereiter (2003) emphasized wikis are tools for knowledge-building which is important for knowledge-creating competencies in a knowledge society. Wikis don't require software, are easily accessible, and are simple to use for everybody. Their special feature is that hyperlinks can be created and texts can be added, deleted or changed so that groups of like-minded people can work collaboratively on one and the same text about certain topic. Wikis' potential for collaborative learning lies in their ability to facilitate shaping of knowledge (Chong & Yamamoto, 2006). Wikis can be regarded as media that support learning due to their ability to facilitate collaboration, to allow for design-based learning, to enhance inventiveness, to support inquiry learning and the co-construction of learning (Chong & Yamamoto, 2006). In general, wikis can be considered to support social constructivist learning.

## **Purpose of Research**

Institutions looking forward to adopting mass collaboration are mainly seeking implicit change in their organizational structure that leads to more effective use of individual talents, the stimulation of creativity, the transfer of knowledge and skills and the supplementary of intellectual companionship (Loan-Clarke & Preston, 2002). Despite the fact that management is extremely essential for the success of the mass collaboration's adoption (Libert & Spector, 2008) most of the studies and researchers are tackling the effects of collaboration (Tapscott & Williams, 2006).

The purpose of this research study is to answer the question of; "How can projects based on mass collaboration be organized in higher education institutions?" The research will be of particular interest to higher education institutions looking to adopt mass collaboration and the related stakeholders such as students, academic personnel, as well as consultants involved in similar projects. Due to the fact that mass collaboration is a new concept and the related literature is limited there are no clear methodologies that focus on the realization of mass collaboration. As the research topic has not reached its full potential, the researcher's aim is to illustrate a case study where the driving force behind the stakeholders' collaboration practices is the development of better knowledge-sharing practices.

## **Research Strategy**

The methodology employed in this research is distinctly qualitative. Denzin and Lincoln (2003) highlight the debate that exists over the robustness, validity and reliability of qualitative studies. They underscore that the word qualitative:

“implies an emphasis on the qualities of entities and on process and meanings that are not experimentally examined or measured in terms of quantity, amount, intensity or frequency. Qualitative researchers stress the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry. Such researchers emphasise the value laden nature of inquiry. They seek answers to questions that stress how social experience is created and given meaning.”

In terms of validity, the emphasis is not on a single standard of truth using the terminology of Ellis and Bochner (2000) but rather a verisimilitude that evokes in readers a feeling that the experience described is lifelike, believable and possible. Ellis and Bochner (2000) claimed that

the introduction of naturalistic and qualitative methods into education has caused the traditional notion of validity to be redefined as trustworthiness or accuracy.

In terms of reliability, Ellis and Bochner (2000) stated that since personal narratives are created from a situated location, trying to make past and present cohere, there is no such thing as orthodox reliability in auto ethnographic research.

The case study is a strategy that particularly suits the descriptive nature of research (Yin, 2003). As the researcher does not have any control on the events; case studies are preferable than other strategies; besides the main theme question of the research is “How or/and “Why” (Yin, 2003). This research strategy also facilitates the use of a descriptive approach as the aim is to describe and analyze a phenomenon non-intrusively. The approach relies on existing knowledge, practices and theories for the formation of the process framework as a way of dealing with the research aim. The descriptive approach aims to gather and illustrate data without any manipulation of the research context (Henrichsen et al., 1997). Conducting a descriptive study makes the research more deductive and requires the use of different data gathering methods and techniques (Miles & Huberman, 1994).

*Units of Analysis:* The research study is concerned with a single mass collaboration project related to the provision of voluntary education in the less developed world through the partnership with the University of the Arts in London and UNIDO (United Nations Industrial Development Organisation) to promote the development of the textile sector.

*Within-case Sampling:* Data was collected from stratified informants within the project unit. Informants were selected based on their roles within the project. This within-case sampling is an important strategy to achieve content validity in qualitative research (Goodwin & Goodwin, 1984).

### **Data Collection**

Interviews, observations and documentation (Miles & Huberman, 1994) were used to improve the construct validity of the research and provide opportunities for triangulation during the analysis of the study as a whole (Creswell, 2007). The documentations helped to understand the project more in-depth. Four interviews were undertaken with the related two Project Managers from the unit of International Education Consultancy, the Head of E-learning and the Web Coordinator in the University of the Arts in London.

### **Data Analysis**

Data reduction is one of the qualitative analysis phases of Miles & Huberman (1994). It consists of various processes: selecting, simplifying, abstracting and transforming the data in field notes and/or transcriptions (Miles and Huberman, 1994). Data reduction took place when choosing the research question, collecting data and dealing with interview transcriptions. Besides, surveys were also given to the interviewees.

### **Findings**

In order to investigate the attitude towards Wiki use, we can show how the new tool influenced the communication with the related parties.

The interviewed personnel confirmed that the relationship with Wiki inside the academic community is very complex and not all the related parties use it.

“When I arrived at our other sites’ in Syria or Bangladesh I realized that most of the academic staff did not know what Wiki was, but then, the tool became a known tool inside our community (UNIDO project group) and other groups started to use it.”  
(Head of E-learning)

Others interviewed confirmed their intensive introduction of Wiki into the workflow process:

“I use Wiki almost every day, for instance, to put together the reading materials and related case studies with regard to textile sector, to give links to free brainstorming and visualization tools that the other party (partnerships outside of UK) might otherwise not be aware of.” (Project Director).

The tool seems to satisfy mostly the needs with regard to documentation. Its perceived value is in the easiness of the publishing system and in the simplification of the traditional documentation repository.

“It is quicker and simpler than html if you want to publish something on the web.”  
(Web Coordinator).

And more:

”It is a sure place where to find your draft documents. Indeed, this way to work reduced the e-mail traffic with the other parties.”  
(Head of E-learning).

These words also prove that wiki influences in a very positive way the quality and effectiveness of people work: they share ideas and collaborate on teaching materials that can be seen and checked practically in real time in order to release daily up-to-date documentations.

This is further confirmed by statements such as

“the fact that we can’t be always present in these distant locations is compensated by the related parties’ autonomy in finding information without the need to ask others”  
(Head of E-learning);

“Effectively, the use of Wiki slims the workflow; it is great when you are able to share knowledge” (Project Director),

“I am sure, now I can see whether the students in other countries are collaborating; yes the horizontal communication is improved!” (Project Director).

The definition of the wiki and the importance of the eight cultural key drivers, found with a deductive method from starting theory- quickness, flexibility, sharing, collaboration, social networking, peering, openness and trust are supported by an empirical experience at the UNIDO project held in partnership with the University of the Arts in London. According to the interviews, the main three key drivers for the use of wiki across the international academic partnerships are: collaboration, sharing and quickness.

This case shows extremely positive evidences that the deductive insights here presented can be considered as a starting point towards further studies that can research how to support a Wiki impact on academic institutions with regard to voluntary education.

## Conclusion

This research intends to propose just a personal and not yet validated manner to assure the right adoption of Wiki inside an educational partnership context. A scientific validation here proposed may be supported by additional studies and structured empirical research to promote systematic surveys in similar contexts of academic partnerships.

One of the main points agreed upon in this study is that the use of Wiki permits not only a knowledge stocking or the sum of prior information, but a true creation and circulation of new knowledge. The results from the interviews and surveys can be useful to the related stakeholders (project managers, teachers, e-learning staff) who want to verify whether Wiki can be

successfully used for academic partnerships in different cultural contexts. Wiki is not just a technology, but a true philosophical way of intending work. Although in this study, wiki has been mainly used for documenting activities and sharing internal resources in an autonomous way it can also be used for other collaborative activities such as meeting arrangements.

## Appendix 1

### Interview Questions

#### Cultural Key driver

1. Quickness	Do you find up-to-dated data useful for your daily work?
	Regarding the booking common resources, Is it possible to make it by yourself?
	Do you find it an easy and quick way to-update information – or knowledge-owner – useful for your work?
	Do you find up-to-dated information about organizational activities?
2. Flexibility	Are you free to dedicate a percentage of your time to your own projects?
	Is it possible to get information about the whole project work progress and direction?
	Is it possible to re-configure and handle contributions from others?
	Are you active in different teams?
3. Sharing	Are the common resources accessible to all and can these be booked in an autonomous way?
	Is it possible to access or find results and insights inside and outside the community?
	Is it usual to implement others' work or co-create documents?
	Is the real time circulation of ideas among the community supported?
4. Collaboration	Do you know which people are involved in your same projects?
	In your team, are individual plans often compatible with the group activity?
	Is it usual to participate to other group projects?
	Is it usual to discuss with others about their work, solving problems together?

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**Editor's Note:** As the web develops new interactive capabilities, and students come armed with social media with audio, graphic and video capabilities, there is renewed opportunity for educational experiences using these familiar media devices. This extension of learning opportunities is challenging teachers to involve themselves with communication cultures well established among students.

## Using Asynchronous and Synchronous Audio Communication Platforms to Enhance Online Learning and Student Connectedness

M. Wallen, S. Burke, and J. Oomen-Early  
USA

### Abstract

In the asynchronous online learning environment, integrating innovative teaching strategies that connect, engage, and motivate learners is imperative to create a quality learning experience for both instructors and learners. Asynchronous and synchronous audio feedback and dialogue are emerging tools that can help increase social interaction, foster a sense of community, and create a positive social climate for learners. The introduction of audio and video may enhance communication between instructor and student and lead to better teaching and learning outcomes. The ability to provide more emotive messages within an online course-room may also enliven and enhance student and instructor engagement with the content, increase student participation, and reduce student attrition. YackPack, Centra, and the use of MP3 audio feedback files allow for social networking within the online classroom, and appeal to both visual and auditory learners. This article will provide a general description and overview of YackPack Voice Groups, Centra, and explain how MP3 audio files can be utilized for feedback and communication. Examples of how these learning tools and platforms can be effectively applied and integrated into online courses and pilot data with limitations and challenges of this new technology are also provided.

**Keywords:** YackPack, Centra, MP3 files, technology, online instruction, social connectedness

### Overview

In the asynchronous fast-paced, online environment, it is imperative for educators to integrate dynamic, innovative, and motivating teaching strategies to foster a sense of community and connectedness and a positive social climate among both instructors and students (Lackie & Terrio, 2007). Using a variety of delivery methods appeals to Web 2.0 learners more fast-paced learning style and allows for greater retention of material (Educause, 2005; Ice & Phillips, 2006). Further, utilization of cutting-edge technology provides learners with a comfort level with this medium making the learner more marketable for future employment. Learners are also challenged with increasing their communication skills which is a necessary skill in today's market. The introduction of audio media in online learning, versus traditional typed responses that are read as text, may enhance communication between the instructor and student and lead to better teaching and learning outcomes. The ability to provide more of the emotive, personal messages within an online course-room may also enliven and enhance student and instructor engagement with the content, increase student participation, and reduce student attrition (Ice & Phillips, 2006). In addition, instructor feedback that may be more time intensive to type can be easily accomplished by providing learners with an audio message. These audio messaging options are easy to use and intuitive for the user, permitting educators to focus on content rather than addressing complex technological issues (Wallen, Burke, Oomen, 2008). The introduction of audio media in online learning, versus traditional typed responses read as text, may enhance communication between the instructor and student, lead to better teaching and learning outcomes, and offer a method of

assessing and responding to students' communication skills. The ability to provide more of the emotive, personal messages within an online course-room may also enliven and enhance student and instructor engagement with the content, increase student participation, and reduce student attrition (Rovai, 2002; Rovai & Lucking, 2000).

Asynchronous and Synchronous Audio Communication social networking tools such as YackPack Voice Groups, Centra, and MP3 file sharing provide students with an opportunity to discuss course-related content, debate a topic, discuss research or final course projects, listen to guest speakers (from as far away as another country), ask questions regarding the course or content, collaborate with other classrooms (near or far) or share current issues. In addition, instructor feedback that may be more time intensive to type can be easily accomplished by providing learners with an audio feedback message. Through the use of YackPack Voice Groups, the instructor can provide online students who have differing schedules with the ability to interact with their classmates, instructor, and guests at different times of the day (asynchronously). By implementing Centra, an engaging learning environment can be established despite limitations of location. Instructors can also utilize free or inexpensive software to create MP3 audio files to help provide meaningful context and rich detail for students when offering assessment feedback. Learners seem to perceive audio feedback in a more relevant and meaningful way and value the more personal feedback provided (Merry & Orsmond, 2007; Oomen-Early, Wiginton, Bold, Gallien & Anderson, 2008).

### ***What are Centra, YackPack, and MP3 Audio Files? and How Can They Be Used in the Online Classroom?***

Centra is a user-friendly, interactive, online learning program that combines a highly interactive virtual classroom learning, e-meeting, and web seminar platform with a learning content management system (Centra, 2008). Centra allows faculty and students to participate in a "live" class from anywhere as long as the user has an Internet connection. All classes using Centra are recorded and archived for easy playback by students unable to attend the live sessions or for students who would like to review the session at a pace more suitable to their learning style. The students can see and hear the instructor as well as respond to the instructor and each other in real time. Multiple presenters can participate in a Centra session and use a whiteboard for interactive markup if needed. Surveys can be created and conducted through the use of Centra sessions. Through an application sharing tool, the session presenter can share any Windows application with class participants for demonstration or presentation purposes. The instructor can also provide guidance while using the Web and allow for all students to see a website, or focus on a particular feature of a website, because all students will see what is on the instructor's screen as he/she navigates through the Web while giving audio and/or video feedback. The instructor can offer auto-graded quizzes or personalized evaluations online. Breakout rooms and labs are also available so the instructor can break larger groups into smaller discussion or work groups and monitor their progress.

There is a cost for the host of Centra sessions, which varies based on the type of institution offering the platform and the number of participants; however, there is no cost to the users. Centra Client will automatically download to participants' computers the first time they log onto the Centra Server. The following web address offers an overview of Centra capabilities and a demonstration of student and instructor interactions:

[http://www.saba.com/products/centra/centra\\_demo/index.html](http://www.saba.com/products/centra/centra_demo/index.html).

### ***YackPack***

YackPack is a web-based asynchronous audio communication tool. YackPack provides the instructor with the ability to develop audio-based asynchronous communications activities for the course through the use of audio messages and instant text messages; however, it can also be used

to relay real time information to participants online and logged in. An email message is sent to each student in the course whenever an audio message is posted in the section of the YackPack AAC system that has been set up for the course. YackPack creates a comfortable learning space for language learners and for those appreciate time to think and create personal responses to questions, comments or opinions offered by others. Creative supplements such as adding a photo also provides the user with a greater sense of connectedness. See Figure 1 for a quick guide on how to use YackPack in the online course room (YackPack, 2007).

1. From your web browser go to [www.yackpack.com](http://www.yackpack.com)
2. On the log in screen, type your email address and password. Note that educators should use their university email address to manage the course and to ensure the students recognize the email address provided.
3. Click, “Log In.”
4. As the facilitator, your name (and possibly picture if uploaded) will be displayed in the center of the “pack.”
5. Each user has three function options that can be navigated by clicking on various areas of the member’s name/picture
  - a. To send a message, click on the members name or picture (you can click on multiple names/pictures for messages to a group of members). The talk box on the side right side of the screen provides functions for recording and sending messages to others in your group. Click on the record button to begin recording your message. Once finished, click on the “send” button.
  - b. To listen to a message sent to you, click on the grey bar under the member’s name/picture.
  - c. To retrieve information about the user, click on the “I” button located to the right of the member’s name or picture.
6. Once you are a member of YackPack, you can then create new “packs” based on your needs. An instructor may want to have various packs for their course sections or based on content or material related to the curriculum. Educators can also set up separate user groups for “study groups” or final group projects.
  - a. Click on the “start a new pack” button
  - b. Assign a name to your new pack
  - c. List the names and email addresses you would like to add to your pack (limit 75)
  - d. Click on “Go to Step 2”
  - e. Write a text message inviting your users to your YackPack site
  - f. When your message is complete, click send invitations and go to step 3
  - g. You have successfully created a new “pack.”

**Figure 1: YackPack How To Guide for Instructors (YackPack, 2006)**

YackPack access has been free in the past; however, small fees may now apply. It can be accessed anywhere with an Internet connection and does not require any software or server installation.



**Figure 2: Screen Shot of YackPack (YackPack, 2006)**

Several free or low-cost software packages are available, which allow instructors to use an internal or external computer microphone to record or convert previously recorded files into MP3 audio files for students. These files may be emailed to students or posted on a student's assignment site within online course platforms such as WebCT or Blackboard. The tone and inflection used when providing audio feedback removes the barriers associated with understanding the intent of the instructor's written notes and clarifies suggestions for improvement vs. explicit feedback for required change. More detail is often provided when speaking than writing and examples are more easily relayed to students verbally as opposed to written text notes. In addition, further emphasis can be made to highlight important content and introduce brief supplemental material.

### **Limitations**

At time of press, YackPack was free of charge for users. However, a small charge of \$5 per user per month may be implemented in the near future. The researchers contacted the owner of YackPack, Dr. B.J. Fogg, at Stanford University, who has created an in-kind user rate for educators. Cost can be an issue and varies with the type of client and number of users of Centra.

### **Centra**

Because Centra is synchronous, schedule conflicts may occur. However, Centra is equipped with a playback feature for later viewing. Students may have to purchase a headset with a microphone for both platforms if their PC system is not equipped with a microphone. The charge for a headset is quite reasonable and should be considered with the cost of course materials. Some believe innovative audio social networking tools are just a "fad" and have no real value in the academic learning environment (Lackie & Terrio, 2007). As an educator, you may be in the role of advocating for the benefits of using a supplemental teaching strategy such as YackPack or Centra. Intellectual property and FERPA are areas of concern for higher education, so it is important for instructors and staff to consider any ethical and legal issues that may hinder the use of these

platforms at their institution (Educause, 2006). There are fewer limitations associated with using MP3 audio files. Depending on the length of the recording, the files may be quite large and require lengthy downloading depending on the user's browser and Internet connection. Some students prefer visual and auditory feedback, so finding a solution to incorporate both is worth investigating in the future.

## Markup Tools

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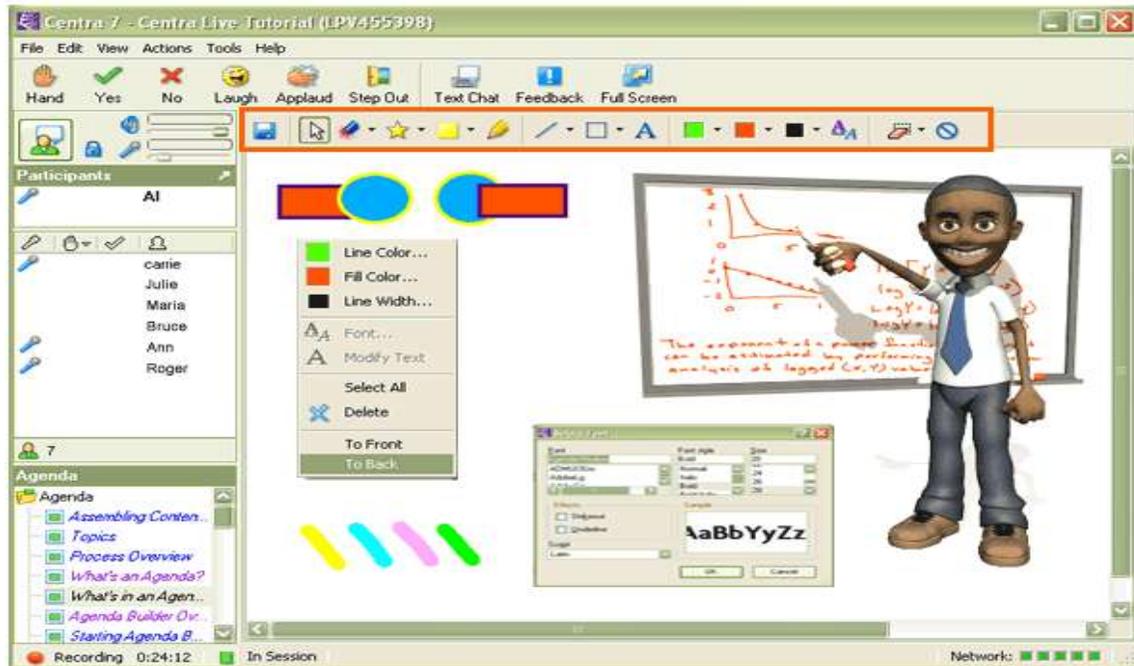


Figure 3. Screenshot of Centra.

### Pilot Study

A pilot study was conducted to explore the perceptions and use of YackPack, Centra, and MP3 audio feedback files among students enrolled in online health education courses. An online survey was utilized by the researchers during Fall of 2007 and Spring of 2008 using a non-randomized convenience sample of students at a large university in the southeastern U.S. A 14-item survey instrument was developed to collect the study data, based on other instrumentation reported in the relevant literature that has been used to assess online technology usage. In addition to items on YackPack, Centra, and MP3 audio feedback file usage and perceptions, demographic items on gender and class standing were included. Face and content validity for the instrument were established by two researchers with expertise in health education and online instructional technology.

In the Fall of 2007 and Spring of 2008, the survey instrument was posted on a survey data collection website (SurveyMonkey), and an email was sent to 54 learners enrolled in three online graduate health education courses. Anonymity and confidentiality of survey participants were maintained on the survey website through the use of Secure Socket Layer (SSL) encryption of the data and by not collecting any unique personal identifiers in the survey. Students received minimal extra credit as an incentive for completing the questionnaires.

- ◆ Divide courses with large numbers of students into smaller, 6-7 people "YackPacks" to make the class more personable and connected.
- ◆ Go from lecture to small discussion by extending the conversation from in class lectures into small virtual YackPacks with an online course supplement.
- ◆ Alleviate some of the stressors of group work by allowing students with differing schedules to interact with their groups at different times of the day (asynchronously)
- ◆ Host a guest speaker YackPack session on related content where students can leave messages for the guest speaker to reply to.
- ◆ Host an asynchronous group debate session on a course-related topic
- ◆ Host a current issue session for learners to share current issues related to the course content
- ◆ Conduct audio case studies, where students analyze and discuss scenarios provided by the instructor in small YackPacks
- ◆ YackPacks can provide a forum for small "study groups" where peer learning takes place
- ◆ YackPack also has text-based capabilities that could accompany audio messages for those who may be hearing impaired.
- ◆ Use YackPacks for course evaluations (both mid-point and post course) to let students informally dialogue about elements of the course content that appealed most and least to them
- ◆ Conduct audio "Q&A" sessions during online office hours, where students can join the Q&A YackPack and ask questions regarding that week's content.

**Figure 4. Teaching Ideas for Using YackPack (Via an Online Course).**

## Results

### *YackPack Pilot*

A total of 14 out of the 20 students who received the study invitation emails completed the survey, for a 70% response rate. Of the total respondents, 7 were male and 7 were female. One student was a sophomore, two were juniors, four were seniors and seven were graduate students. Seventy percent ( $n = 10$ ) moderately agreed that they enjoyed using YackPack as a discussion tool. Two felt that they strongly agreed they enjoyed using YackPack and only two moderately disagreed they enjoyed using YackPack. Ten respondents strongly or moderately felt it was easy to use (69.6%). Close to 80% ( $n = 11$ ) of learners listened to their audio messages from their fellow learners and half ( $n = 7$ ) felt comfortable creating audio messages.

All learners agreed that YackPack could be a very helpful communication tool for students and the instructor in online courses. Interestingly, only 36% of students agreed that they would prefer using audio discussion boards rather than written discussion boards with their peers. The findings were similar with respect to audio messages saving time. Eighty percent of respondents felt that using YackPack could help them understand course content better than without having it as part of the class. And lastly, 100% of learners felt that YackPack helped improve student peer and instructor interaction in the virtual classroom.

- ◆ Host a guest speaker from another location or country, which can be used live or saved and used for future classes with the playback feature.
- ◆ Have a debate between two groups within an online class.
- ◆ Hold question and answer sessions to review a new concept.
- ◆ Have students present projects, presentations, or papers to the entire class or in small groups using the breakout rooms.
- ◆ Have students work in small groups to critique an article, text excerpt, or analyze a case study.
- ◆ Use the white board to teach new statistical formulas or use the applications share tool to have students apply new methods for solving problems with real time feedback.
- ◆ Conduct portfolio and peer review sessions.
- ◆ Use the web cam video panel feature to have students teach a class or practice a new pedagogy method with real time participation and feedback (the playback feature will also allow the guest teacher to analyze his/her performance as well).
- ◆ Present new material through the use of PowerPoint, Word, Excel, or video and/or the Internet.
- ◆ Use the web cam feature to demonstrate kinesthetic movement, first aid techniques, conduct experiments in real time, and to provide any other instruction which requires viewing an active demonstration. The web cam feature can also be used by the students for the instructor to watch their application of the skills taught. The instructor can offer real time feedback during the assessment/practice session.
- ◆ Conduct an online focus group to explore a research question.
- ◆ Conduct online tutorials or provided guided instruction using a new technology tool, website, or program.
- ◆ Link learners from two different courses to interact or explore a learning issue.
- ◆ Use Centra as a voice over recording tool for your PowerPoint presentations to be saved and viewed at another time.
- ◆ Host your online virtual office hours in a weekly scheduled session for your distance education learners

**Figure 5: Ideas for hosting Centra Sessions via an Online Course**

### ***Centra Pilot***

Twelve out of eighteen students enrolled in a graduate health education course completed an initial questionnaire regarding their perceptions of Centra as an additional tool in their online course, for a 66% response rate. Seventy three percent of the students (n = 8) were female with 33% (n=4) male. Fifty percent of students always used the playback recording feature when not able to attend a Centra session, while 42% used it occasionally. Ninety-two percent of respondents (n = 11) moderately to strongly agreed Centra was user friendly and easy to use. The majority of students (n = 11) felt that users at least needed a small level to a moderate level of technical experience to use Centra. Most students (n = 11) felt that they enjoyed the Centra sessions hosted by the instructor and 100% (n = 12) agreed that the session enhances their understanding of the course content.

All moderately or strongly agreed that Centra could be a very helpful communication tool for instructors in online courses and can improve connectedness in the virtual classroom. Seventy-four percent of the respondents would prefer Centra sessions rather than written discussion questions with peers, if given the choice. All agreed Centra should be used the next time the course is taught. Some of the qualitative comments shared were,

I enjoyed the personal contact, the ability to ask questions and hear other students ask questions and receive immediate feedback. The use of documents and presentations were very helpful. The one session I missed was due to my own failure of not reading an email. I will go back and review the recording.

I was very impressed the first time I used Centra. I thought it was a great way to connect with the professor and classmates. I think it is a great tool for distance learning because it allows interaction that is typically unavailable.

At first, I was a little nervous of Centra...but after the initial class, I can't imagine the class without it. I appreciate the ability to playback the session, it was quite helpful. I believe that without the Centra sessions, I would not have been as successful as I have been. I hope my classes in the future will access this capability.

### ***MP3 Audio Feedback File Pilot***

Sixteen out of the 16 students enrolled in a graduate health education course completed the survey resulting in a 100 % response rate. Of the total respondents, two were male (12.5%) and 14 were female (87.5%). All survey respondents believed the audio messages were easy to access and play and enjoyed the audio feedback posted by the instructor. A majority of the students (n=15) agreed that the audio messages used in the course enhanced their understanding of the course content and all students recommended using audio messaging the next time the course was offered. All students also believed that audio messages help to improve the connectedness felt by the student to the instructor in a virtual classroom. When asked to share personal thoughts about audio messaging as a teaching and learning tool for the online classroom, students' responses included the following:

The audio messages are very informative and creative. It creates a feeling of person to person contact with the instructor on a weekly basis. I enjoyed having the resource of the audio messages. I think they (the audio messages) are helpful to connect with the instructor but they should not be the only method of communication for information... they should be another option to learn what's necessary. They (the audio messages) helped me understand the material. The audio messages made this course feel just like a traditional classroom course. I would recommend audio messages for all online courses.

It should be noted that these instruments were created by the researchers and reliability was not established. The purpose of the surveys was to gain insight into students' perceptions of these integrated online platforms. Because of the small sample size, inferential statistics were not applied. The results are not generalizable beyond the current population sampled.

### ***Need and Impact***

The research literature related to developing and evaluating the effectiveness of communities, particularly online communities consistently support the need for classroom components such as support, cooperation, commitment, and interaction. Researchers report evidence of a significant relationship between classroom community and perceived cognitive learning (Rovai, 2002; Rovai & Lucking, 2000). Full time distance education students report that the interaction links between students in an online course help to overcome feelings of isolation and provide affective support (Anderson, 2004). Through the use small group discussions and other teaching activities that promote collaboration, Weigel (2001) shares, "social presence, cognitive presence, and teaching

presence coalesce and deep learning takes place” (p.5-6). Asynchronous and synchronous messaging in online instruction is an important and growing medium which instructors can build social presence and foster a sense of online community. This pilot data, though small, provides initial insight into the effectiveness of these platforms.

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**Editor's Note:** When you have a diversity of cultures and different primary languages, levels of experience, and learning styles, you need additional options for learners and teachers to enhance the teaching - learning process. Tutoring, coupled with audiovisuals and/or interactive multimedia are possible options. This study uses videos to enhance student attitudes and improve learning in the experimental group.

## **Enhancing Mathematical Attitude through Video Programmes Among 10<sup>th</sup> Grade Standard NIOS Students – An Experiment**

**S. Rastogi and R. K. Arya**

**Africa and India**

### **Introduction**

The National Institute of Open Schooling (NIOS), New Delhi has opened admissions and course selection without any genuine restriction. Any person who desires to join a Secondary level programme may select any course (including Mathematics) of his /her choice. Later on, they may face problems of low achievement, particularly in Mathematics. A negative attitude or a low positive attitude towards Mathematics may be a reason for low achievement. It is essential to improve attitude towards this subject if we want a higher level of achievement. An individual, who has associated himself with positive affect or feeling with some psychological object, is said to like that object, or in other words, has a favourable attitude towards that object. Similarly, an individual who has associated negative affect or feeling with that object is said to dislike that object or in other words, he has an unfavorable attitude towards that object. Thus, attitude can be expressed as a continuum from highly positive attitude to highly negative attitude, with various shades of positive negative attitudes in between including a neutral zone which indicate neither favourable nor unfavourable attitude. Thinking In terms of a continuum, it is possible to find out the degree or extent of 'positiveness' or 'negativeness' of an attitude. Thus, the attitudes of different individual can be compared. This definition appears to be more scientific and useful for operational and measurement purposes. The investigator has adopted this definition in the present study. Traditional assumption of most research on attitudes (Newcomb et. al. 1963) is that the introduction of new information, both positive and negative, will change the attitudes of people, especially those in the process of school education. A concept of attitude change, which equally integrates belief and behaviour and includes the value of conflict as a means of institutional reform (designed to realise human values), has profound educational implications.

### **Objectives**

Following objectives were framed in order to examine the effect of Video Programmes on Attitude towards Mathematics among 10th grade NIOS students.

1. To assess present Attitude level towards Mathematics among target group students.
2. To examine change in Attitude level through Video Programmes in the target group.
3. To compare changes in Experimental group and Control group regarding Mathematical Attitude.
4. To analyse the significance of difference (if any), between 'Rural & Urban' area learners as well as between 'Male & Female' learners regarding change in Mathematical Attitude.
5. To recommend the use of proposed Video Programmes, if found effective for a significant change in Mathematical Attitude among Target Group learners.
6. To suggest some other strategy, if the proposed Video Programmes have no potential for a significant change in Mathematical Attitude among target group learners.

## Methodology

While selecting a suitable Mathematical attitude scale, the investigator had given thought to the condition of NIOS learners and their previous background in the field of Mathematics. These NIOS learners belong to a heterogeneous group, having different levels of previous academic experiences. These learners have less experience in learning Mathematics compared to traditional students having a continuous 10 year study experience. NIOS learners do not attend regular classes like their counterparts in a conventional system. They rarely meet their teacher / tutor for interaction on various issues. Under these circumstances, the investigator examined various available tests in the NCERT library but no test was found to be satisfactory because these tests were developed for traditional students. The investigator also examined a Mathematical attitude scale developed and standardized by Dr. S. Rastogi. The test had item related to attitude towards Mathematics for the beginners. This test has 24 items, having 12 positive and 12 negative items distributed over a five point scale. The learners were supposed to put a tick mark in one of the five columns of their choice. There was no time limit for completing this test and learners had full freedom to take their own time. However, it was observed that between 20 to 40 minutes, all learners completed the test. \

Numerical weights were assigned as below.

<b>Response</b>	<b>For + Statement</b>	<b>For – Statement</b>
Strongly Agree	5	1
Agree	4	2
Neither Agree nor Disagree	3	3
Disagree	2	4
Strongly Disagree	1	5

Sum of the weights on all the 24 statements was the learners' total score for that form. The scores obtained in + statement and – statements were added to derive a final score by a learner. These scores became raw data for calculation in both pretest and post test. The criteria for respondent classification was as below:

<b>S. No.</b>	<b>Points</b>	<b>Remarks</b>
1	24 – 55	Low Attitude
2	56 – 87	Average Attitude
3	88 - 120	High Attitude

The selected Attitude Scale was given twice as 'Pre-test' (March 04) and 'Post-test' (June 04). The Experimental Group studied some difficult concepts through Video Programmes and Tutor Support, while the Control Group had tutor support only. There were Six Videos on Profit and Loss, Area, Volume and Surface Area, Triangle, Pythagoras Theorem, and Circle.

**Table 1**  
**Sampling Structure for the Experiment**

S. No.	Region	Total	Region wise Gender Representation			All	Remarks
				M	F		
1	South	200	R	50	50	200	An effort was made to have equal representation in each target group from all four areas.
			U	50	50		
2	West	200	R	50	50	200	
			U	50	50		
3	North	200	R	50	50	200	
			U	50	50		
4	East	200	R	50	50	200	
			U	50	50		
	<b>Total</b>	<b>800</b>		<b>400</b>	<b>400</b>	<b>800</b>	

The investigator made a wide survey of different AIs in all four areas of both zones of Delhi. He met the coordinators of different AIs and discussed this experiment. On the basis of suitability, availability and cooperation from learners and staff from various AIs, the investigator chose 50 learners from each of the following 16 AIs as the sample for this research. Table 2 indicates the number and name of AIs taken in the sample.

### ***Limitations of this Study***

The study was limited to 10th grade NIOS learners in the Delhi Region.

1. Various variables like intelligence, interest in Mathematics, motivational level, socio economic status of the family, previous knowledge level of the Learners, were not considered due to lack of time and the complexity of these variables.
2. No age limit was considered because no age restriction is imposed for NIOS learners.
3. Both genders were taken in approximately equal numbers to calculate gender differences.
4. The effect of Rural and Urban background on learners' achievement in Mathematics was part of this study.

### ***Results of Inferential Analysis***

The Mathematical Attitude Scale (adopted) was administered two times to examine the significance of change in attitude in the target group. Therefore, this analysis covered only two situations as Pre Test and Post Test, for all sub groups like Rural and Urban, Male and Female, and All learners. The detailed inferential analysis is shown in the Tables given below:

**Table 2**  
**Sample Distribution in Various Regions**

Region	AIs	Name of School	Type	No. of Learners
South	4701	Delhi Jain Public Sr. Sec. School, Palam, N.D.-110045	Rural	50
	4750	Hira Public School, Samalika, N.D.-110037	Rural	50
	7717	Sarvodaya Bal Vidyalaya, Lajpat Nagar, N.D.-110024	Urban	50
	7788	Sarvodaya Bal Vidyalaya, Delhi Cant., N.D.-110010	Urban	50
West	4706	Govt. Sarvodaya Bal Vidyalaya, Matiala, N.D.-110059	Rural	50
	47B3	Rajdhani Public School, Hastal, N.D.-110059	Rural	50
	47B4	Mamta Modern Sr. Sec. School, Vikas Puri, N.D.-110018	Urban	50
	7793	New Delhi Public School, A-Block, Vikas Puri, N.D.-110018	Urban	50
North	2797	St. Jivan Public Secondary School, Mundaka, Delhi-110041	Rural	50
	7769	Govt. Boys Sr. Sec. School, Sultanpuri, N.D.-110041	Rural	50
	4711	Jain Bharti Model School, Sector-16, Rohini, Delhi-85	Urban	50
	7790	Sarvodaya Bal Vidyalaya, Shalimar Bagh, Delhi-52	Urban	50
East	4708	Sarvodaya Bal Vidyalaya, Khajoori Khas, Delhi-94	Rural	50
	4718	Govt. Boys Sr. Sec. School, Khichripur, Delhi-91	Rural	50
	2793	Sanatan Dharam Sr. Sec. School, Shahdara, Delhi-32	Urban	50
	7736	Govt Boys Sr. Sec. School (1), Yamuna Vihar, Delhi-53	Urban	50

**Table 3**  
**Mean, SD and t Values between Control Group and Experimental Group for ATTITUDE TEST of rural area learners (Pre Test). N = 200**

S. No.	Group	Mean	SD	Std. Error (Mean)	t value	Remark
1.	Control	63.04	6.83	1.44	1.42	NS(.05)
2.	Experimental	64.00	6.53	1.15		

M1-M2 = 0.96      not significant

**Table 4**  
**Mean, SD and t Values between Control Group and Experimental Group**  
**for ATTITUDE TEST of Urban area learners (Pre Test). N = 200**

S. No.	Group	Mean	SD	Std. Error (Mean)	t value	Remark
1.	Control	64.80	6.46	1.46	1.23	NS(.05)
2.	Experimental	66.86	6.06	1.12		

M1-M2 = 2.08      not significant

**Table 5**  
**Mean, SD and t Values between Control Group and Experimental Group**  
**for ATTITUDE TEST of Male learners (Pre Test). N = 200**

S. No.	Group	Mean	SD	Std. Error (Mean)	t value	Remark
1.	Control	63.68	6.69	1.47	1.05	NS(.05)
2.	Experimental	64.48	6.61	1.77		

M1-M2 = 0.8      not significant

**Table 6**  
**Mean, SD and t Values between Control Group and Experimental Group**  
**for ATTITUDE TEST of Female learners (Pre Test). N = 200**

S. No.	Group	Mean	SD	Std. Error (Mean)	t value	Remark
1.	Control	65.28	6.30	1.42	1.56	NS(.05)
2.	Experimental	66.56	6.07	1.73		

M1-M2 = 1.28      not significant

**Table No – 7**  
**Mean, SD and t Values between Control Group and Experimental Group**  
**for ATTITUDE TEST of All learners (Pre Test). N = 400**

S. No.	Group	Mean	SD	Std. Error (Mean)	t value	Remark
1.	Control	64.48	4.58	1.02	1.68	NS(.05)
2.	Experimental	65.52	4.46	1.24		

M1-M2 = 1.04      not significant

**Table 8**  
**Mean, SD and t Values between Control Group and Experimental Group**  
**for ATTITUDE TEST of rural area learners (Post Test). N = 200**

S. No.	Group	Mean	SD	Std. Error (Mean)	t value	Remark
1.	Control	64.00	6.59	1.43	1.667	NS(.05)
2.	Experimental	83.20	8.26	1.43		

M1-M2 = 19.20                      not significant

**Table 9**  
**Mean, SD and t Values between Control Group and Experimental Group**  
**for ATTITUDE TEST of Urban area learners (Post Test). N = 200**

S. No.	Group	Mean	SD	Std. Error (Mean)	t value	Remark
1.	Control	66.24	6.19	1.48	6.06	S(.01)
2.	Experimental	84.32	9.18	1.23		

M1-M2 = 18.08                      SIGNIFICANT

**Table 10**  
**Mean, SD and t Values between Control Group and Experimental Group**  
**for ATTITUDE TEST of Male learners (Post Test). N = 200**

S. No.	Group	Mean	SD	Std. Error (Mean)	t value	Remark
1.	Control	64.96	6.38	1.45	11.42	S(.01)
2.	Experimental	82.88	7.95	1.76		

M1-M2 = 17.92                      SIGNIFICANT

**Table 11**  
**Mean, SD and t Values between Control Group and Experimental Group**  
**for ATTITUDE TEST of Female learners (Post Test). N = 200**

S. No.	Group	Mean	SD	Std. Error (Mean)	t value	Remark
1.	Control	65.92	6.21	1.46	9.58	S(.01)
2.	Experimental	84.40	8.14	1.73		

M1-M2 = 18.48                      SIGNIFICANT

**Table 12**

**Mean, SD and t Values between Control Group and Experimental Group for ATTITUDE TEST of All learners (Post Test). N = 400**

S. No.	Group	Mean	SD	Std. Error (Mean)	t value	Remark
1.	Control	65.44	4.45	1.03	13.03	S(.01)
2.	Experimental	82.64	5.78	1.23		

M1-M2 = 17.20

SIGNIFICANT

**Table 13**

**Mean, SD and t Values between Pre Test and Post Test for Control Group of rural area learners - ATTITUDE TEST. N = 200**

Test	Mean	SD	r	t value	Remark
Pre Test	63.04	6.83	.79	.220	NS(.05)
Post Test	64.00	6.59			

M1-M2 = 0.96

not significant

**Table 14**

**Mean, SD and t Values between Pre Test and Post Test for Experimental Group of rural area learners - ATTITUDE TEST. N = 200**

Test	Mean	SD	r	t value	Remark
Pre Test	64.00	6.53	.86	4.51	S(.01)
Post Test	83.20	8.26			

M1-M2 = 19.20

SIGNIFICANT

**Table 15**

**Mean, SD and t Values between Pre Test and Post Test for Control Group of Urban area learners - ATTITUDE TEST. N = 200**

Test	Mean	SD	r	t value	Remark
Pre Test	64.80	6.46	.81	.369	NS(.05)
Post Test	66.24	6.19			

M1-M2 = 1.44

not significant

**Table 16**  
**Mean, SD and t Values between Pre Test and Post Test for Experimental Group of Urban area learners – ATTITUDE TEST. N = 200**

Test	Mean	SD	r	t value	Remark
Pre Test	66.88	6.06	.82	3.20	S(.01)
Post Test	84.32	9.18			

M1-M2 = 17.44

SIGNIFICANT

**Table 17**  
**Mean, SD and t Values between Pre Test and Post Test for Control Group of Male learners - ATTITUDE TEST. N = 200**

Test	Mean	SD	r	t value	Remark
Pre Test	63.68	6.69	.79	.301	NS(.05)
Post Test	64.96	6.38			

M1-M2 = 1.28

not significant

**Table 18**  
**Mean, SD and t Values between Pre Test and Post Test for Experimental Group of Male learners - ATTITUDE TEST. N = 200**

Test	Mean	SD	r	t value	Remark
Pre Test	64.48	6.61	.87	4.68	S(.01)
Post Test	82.88	7.95			

M1-M2 = 18.40

SIGNIFICANT

**Table 19**  
**Mean, SD and t Values between Pre Test and Post Test for Control Group of Female learners - ATTITUDE TEST. N = 200**

Test	Mean	SD	r	t value	Remark
Pre Test	65.28	6.30	.76	.147	NS(.05)
Post Test	65.92	6.21			

M1-M2 = .64

not significant

**Table 20**  
**Mean, SD and t Values between Pre Test and Post Test for Experimental Group of Female learners - ATTITUDE TEST. N = 200**

Test	Mean	SD	r	t value	Remark
Pre Test	66.56	6.07	.86	3.72	S(.01)
Post Test	82.40	8.14			

M1-M2 = 15.84

SIGNIFICANT

**Table 21**  
**Mean, SD and t Values between Pre Test and Post Test for Control Group of ALL learners - ATTITUDE TEST. N = 400**

Test	Mean	SD	r	t value	Remark
Pre Test	64.48	4.58	.77	.30	NS(.05)
Post Test	65.44	4.45			

M1-M2 = .96

not significant

**Table No 22**  
**Mean, SD and t Values between Pre Test and Post Test for Experimental Group of ALL learners - ATTITUDE TEST. N = 400**

Test	Mean	SD	r	t value	Remark
Pre Test	65.52	4.46	0.89	6.29	S(.01)
Post Test	82.64	5.78			

M1-M2 = 17.12

SIGNIFICANT

It was found from inferential analysis of Pre Test results for the Attitude Test, that Rural and Urban, Male and Female, as well as ALL learners were almost similar for Control Groups and Experimental Groups. This indicated that Control Group and Experimental Group, everywhere for attitude scale were similar. This was verified from Tables 3 to 7. After experimentation, it was observed that in rural areas, the Experimental Group and Control Group had no significant difference. But, in Urban Areas, this difference was significant in favour of Experimental Group. Similarly, Male and Female groups had significant differences in favour of Experimental Group. Similar results were obtained for whole group also. It can be seen from tables 8 to 12. In the case of Attitude change towards Mathematics, the results indicated that Control Group (for Rural, Urban, Male, Female and All learners) had no significant difference (Tables 13, 15, 17, 19, 21). On the other hand, all sub groups of the Experimental Group had a significant change in their Attitude towards Mathematics (Tables 14, 16, 18, 20, 22). The video programme and tutor support combination was effective in changing the Attitude of Experimental Group learners. Tutor support had no effect upon the learners of Control Group. Thus, it was found that Video Programmes along with tutor support have a potential for changing Mathematical attitude among Tenth Grade NIOS learners so it was recommended for use among the target group. There was no need to recommend any other strategy based on the findings of this study this study.

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