ADOLESCENTS' COMPUTER MEDIATED LEARNING AND INFLUENCES ON INTER-PERSONAL RELATIONSHIPS

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ABSTRACT

This study reports the findings of the several projects initiated at the Faculty of Education, Goce Delcev University, Stip, to investigate the motivation skills, but is uniquely specific to as inter, personal relationships and resources that influence the learner's participation in the teaching/learning process in the context of online-learning and face to face learning (FtF). Uniquely it also explores e-mail romantic relationships with regard to the levels of relationship satisfaction, intimacy, "inclusion" and interpersonal attraction. Empirical research of this kind is arguably rare and will lead to a better understanding of the possibilities and limitations of a medium that could have large effects on the relationships we have in the lives of participants of computer mediated learning.

Keywords: Computer-Mediated Learning, Inter-personal Relationships.

INTRODUCTION

This study is one of several projects initiated at University of Stip, Faculty of Education, to investigate the motivations, skills, inter-personal relationships and resources that influence a learner's participation in the teaching learning process in the context of both online-learning and face to face learning. While it is generally acknowledged that current developments associated with the information and communication technologies have restructured the world predicating the advent of the information society, little has been studied or reported empirically as to the rather 'earthy' and quite natural humanistic side as to the influence of such mediums on personal relationships of participants as how this might influence the virtues in virtuosity.

Those that have investigated the influences of computer mediated communications and relationships as to their potential capacity to transcend the space and time delimiters have suggested that information and communication technologies are facilitating the emergence of unprecedented configurations of human sociality in the information society (Nickerson and Zodhiates, 1988; Quarterman, 1990; Bandura 1997).

This 'techno-sociality' appears in either new (inter) active social relationships or in new forms of collective/ distributed subjectivity composing so called "virtual communities." Rheingold (1993) refers to the world created by telecommunications as a "virtual community" or "global village" (McLuhan). The description of a virtual community refers to the use of words and images and different meditating multimedia over computer networks to mediate feelings, thoughts, talk, stay in touch, in co creating scientific ideas and reports, publish a novel, or in conducting a meeting. Therefore, while findings about the role of the individual learner in the process of learning have been generated by decades of research in psychology, that has not been the case for the broader world which involved the relationships as we propose.

The work of Bandura (1986) crystallized a theoretical foundation for the study of learners in what he termed a social-cognitive theory. The educational application of Bandura's social cognitive theory manifested itself in a

concept known as self-regulated learning. Understanding the concept of self-regulation is important in the development of the achievement capabilities for both teachers and students. Self-regulated learning is a self-initiated action that involves goal setting and regulating one's efforts to reach the goal, self-monitoring (meta-cognition), time management, and physical and social environment regulation (Zimmerman and Risemberg 1997). It is widely recognized and accepted that computer mediated communication (CMC) is increasingly influencing our organizational and personal communication, however there is less awareness, and perhaps less interest in the private inter-personal relationships that are influenced as a consequence of computer mediated communication. Internet based distant learning programs and computer networks have affected the social and private lives of millions of users worldwide (Quarterman, 1990).

In discussing what can replace the proximity based and traditional learning community, Cutler (1994) argues that the "traditional community based upon location, a history of interlocked relationships, has fallen away. What can replace it?"(p. 11). In his critical analysis of CMC, Cutler notes that in the new social situation there are new relationships and new roles emerging what place pressure on personal identities. While accepting the premise of changing role seems almost obvious the question of the pressures being placed on personal identities of such role is less certain and leads to the question: is he right or not?

Methodology

First of all we must make a distinction between "Computer Mediated Communication" (CMC) and "Face to Face Communication" (FtF). The term CMC refers to a type of inter-personal communication which is facilitated through the use of computer network or conferencing system (Jettmar et al., 1996). In contrast, FtF describes an inter-personal communication setting in which all participants share a common space and time context, and can engage in communication where all five senses are used by the participants.

The researchers based this research on the social - emotion - oriented research model in CMC environments. It relies primarily on Walther's (1992). Social Information Processing Model, which follows on principles in social cognition and inter-personal relationship development from social psychology. According to Walther, the Social Information Processing Model refers to the way in which communicators process relational and social identity cues using various media.

This is a quantitative study of 140 students, in period of late adolescence, in their second year of study, answering the question we derived from Cutler (1994) which has two primarily goals through five hypothesis.

Goals

The first and primary goal was to identify any changes in learning strategies on a sample of student in their second year of pedagogical education with specific attention to the variables of motivation and learning strategy in the distinct context for comparison for online and face to face learning.

The second main aim of this study was to compare more earthy and humanistic side of the romantic CMC versus FtF. Specifically, it explores e-mail relationships with regards to the levels of relationship satisfaction, intimacy, "inclusion" and interpersonal attraction of participants.

Hypothesis

H_1: There is a difference in the usage of the motivated and learning strategy that occurred during the second year of pedagogical education between students, adolescents, who prefer online and those who prefer face to face learning.

H_2: In romantic, long-term, cross-gender relationships the level of relational satisfaction is lower in CMC relationships than in FtF relationships.

H_3: In romantic, long-term, cross-gender relationships the level of intimacy is lower in CMC relationships than in FtF relationships.

H_4: In romantic, long-term, cross-gender relationships the level of inclusion of the other's personality in the self is lower in CMC relationships than in FtF relationships.

H_5: In romantic, long-term, cross-gender relationships the level of interpersonal attraction is lower in CMC relationships than in FtF relationships.

Sample

The participants (140 students, adolescents, at the Faculty of Education, Stip) were divided into two subgroups in relation to the criterion experience with online learning by means of a separate questionnaire and a scale of attitudes related to the online-learning. The first subgroup is made up of 85 students with a positive preference attitude and one year of online-learning experience. The second subgroup is made up of 55 students, adolescents, with little or no online-learning experience who prefer face to face learning.

Self-regulation is a fairly new construct of motivation and it refers to "learning that occurs from students' behaviours that are systematically oriented toward attainment of learning goals" (Schunk 1990, 3). In accordance with the main aim of the first part of the project and the theoretical-empirical framework the researchers have established the first hypothesis.

H_1: There is a difference in the usage of the motivated and learning strategy that occurred during the second year of pedagogical education between students who prefer online and those who prefer face to face learning.

Students from two subgroups first filled in a questionnaire which measured the scale of attitudes related to the online and face to face learning. The MSLQ (Pintrich et al. 1991) was selected as the instrument to measure the component of self- regulated learning explored in this study. Students from both subgroups filled in the MSLQ at the beginning and at the end of the first and second academic year. This pre-test and post-test design was implemented to identify any changes in learning strategies that occurred during the second year of pedagogical education. Data from the students' permanent records were obtained to identify the students' performance in first and second year subjects.

The second part of the study tried to explore romantic CMC versus FtF relationships. The same students took part in the second part of the project. In more modern times romantic love has been the theme of art entertainment in all its forms. Some of the greatest poetry (e.g. Shakespeare's sonnets), opera (e.g. La Boheme), and literature (e.g. Pride and Prejudice) have romantic love as the main theme. Similarly much of more popular culture from theatre to film to popular music has romantic love at its heart. Can "love" be found and fostered via CMC? If one believes that love is essentially in the mind of the person "in love," then it seems that it can be found. Psychologist generally agree that "romantic love is inexorably tied up with fantasy" . As Waller and Hill (1951) put it: "Idealization is an essential element in romantic love" (120). How better to idealize than through CMC, where one is left to paint his or her own mental picture of someone?.

The researchers tried to compare romantic CMC versus FtF relationships. They explored e-mail relationships with regards to the levels of relationship satisfaction, intimacy, "inclusion" and interpersonal attraction. Only 85 students who reported both FtF and CMC friendship (with a minimum length of one month for CMC) qualified for participation. About half of the students had never seen their dyadic CMC partner. Those who had seen him / her had not seen the other person for at least three months in order to qualify for participation.

It focuses on the question whether, due to the nature of computer mediated communication, lower levels of relational satisfaction, or even intimacy, "as the inclusion of other in the self" and inter-personal attraction, are obtained in this medium rather than in face to face communication settings. This is an attempt to systematically compare variables measuring the quality of romantic relationships in FtF versus CMC. For the purpose of this study, relational satisfaction is defined as a favourable affective response to the reinforcement of positive expectations in a relationship. The absence of non-verbal cues is expected to cause a decrease in relational satisfaction.

H_2: In romantic, long-term, cross-gender relationships the level of relational satisfaction is lower in CMC relationships than in FtF relationships.

Relational intimacy describes feelings and perceptions of union, closeness, interdependence, warmth and affection (Andersen, 1989).

Almost all theorists agree that inter-personal attraction is a "positive or negative attitude toward another person". (Berscheid & Hatfield, 1978, 2)."Attitude" means a person's readiness to respond toward an object, or a class of objects, in a favorable or unfavorable manner. Inter-personal attraction (or interpersonal hostility) is defined as "an individual's tendency or predisposition to evaluate another person or symbol of that person in a positive (or negative) way" (Berscheid & Hatfield, 1978, 2).

Non-verbal communication has been proven to be a crucial part of intimate relationships. Therefore, it is hypothesized that the lack of non-verbal communication in romantic CMC leads to a lower level of relational intimacy.

H_3: In romantic, long-term, cross-gender relationships the level of intimacy is lower in CMC relationships than in FtF relationships.

Findings which describe intimacy as a process of escalating reciprocity of self-disclosure in which each individual feels his or her innermost self validated, understood and cared for by the other, lead to the concept of a connection of self's in a close relationship, or "inclusion of other in the self". Non-verbal communication is believed to play an important role in this process, too (Patterson 1988).Therefore, it is hypothesized that the lack of nonverbal communication in romantic CMC leads to a lower level of relational inclusion of the other's personality in the self.

H_4: In romantic, long-term, cross-gender relationships the level of inclusion of the other's personality in the self is lower in CMC relationships than in FtF relationships.

Inter-personal attraction has been found to be a facilitator of inter-personal communication, and much inter-personal communication has been found to exist for the primary purpose of enhancing interpersonal attraction (McCroskey and McCain 1974). Physical appearance has been found to have great communication potential, and in experiments, subjects have attributed more positive qualities to physically attractive people (Burgon, Buller and Woodall 1989).Therefore, it can be hypothesized that the level of attraction is lower when no nonverbal cues are available, as is the case in romantic CMC.

H_5: In romantic, long-term, cross-gender relationships the level of interpersonal attraction is lower in CMC relationships than in FtF relationships.

In order to measure relational satisfaction, interpersonal intimacy, inclusion and attraction, several different scales were employed. The first section of the questionnaire measured intimacy, using a slightly simplified version of Andersen and Jensen's Generalized Immediacy Scale (1979).The second section of the questionnaire measured relational satisfaction, using a shortened version of Hendrick's Relational Assessment Scale (1988). The third part of the questionnaire measured attraction, using modified versions of McCroskey and McCain's Interpersonal Attraction Scale (1974). The fourth part of the questionnaire measured the level of inclusion of the other in the self, using Aron and Aron's Inclusion of Other in the Self Scale (1992). The last section of the questionnaire asked students for demographic information (age, gender, e-mail experience, duration of described relationships)-Demographic questionnaire. The researchers wanted to point it out that before they started to implement this scales and questionnaire they prepared pilot survey in order to modify and adapt them .

One tailed 't' test for paired samples were performed to detect differences in the means for relational satisfaction, intimacy, inclusion, and attraction between CMC and FtF relationships. One tailed 't' test were used because the hypotheses predicted that the means for the variables would be lower for CMC than for FtF.

Results and Discussion

Results of the first part of the study

Evaluations of the changes between the first and second administrations of the MSLQ descriptive statistics and paired t-test were run on each of the fifteen scales. An exploratory evaluation of the impact of the fifteen scales of the MSLQ on the total first and second year grades was

done using three multiple regression analyses with groups of independent variables (pre-test MSLQ scores, post test MSLQ scores and change scores calculated by subtracting pre test scores from post-test scores), predicting the second year grade. Using the R^2 as the statistic of interest, an important shift in the relationships of the variables with the first and second year grade was identified. For the 85 students of first subgroup with pre- and post-test scores, pre test MSLQ scores explained 36% of the variability in the second year grade. At post-test, the MSLQ scores explained 24% of the second year grade. But most dramatically, the change scores on the fifteen scales explained 40% of the variability in the second year grade.

The researchers confirmed the first hypothesis H_1. There is a difference in the usage of motivated and learning strategy that occurred during the second year of pedagogical education between students who prefer online and those who prefer face to face learning. For the first subgroup all of the significant changes were in a positive direction, indicating an increase in scores at the end of the second year from the students' initial scores. The change in intrinsic goal orientation is one of two variables significantly related to the second year grade ($r = .27$, $p = .043$).The direction of the relationship for this variable indicates that as a whole, intrinsic goal orientation increased, however , they also realized a higher second year grade.

Most substantial, the correlation between change in self-efficacy and the second year grade was statistically significant ($r = .43$, $p = .000$), suggesting that students who felt confident that they would do well had higher grades than students who felt less confident in their ability to do well. Of the second sub area of date from the MSLQ, that of the learning strategies, no statistically significant relationships were detected with the second year grade.

In the third sub-area, learning resources management, none of the MSLQ resource variables was significantly related to the second year grade. If for a moment we compare the decreasing and the increasing trends of the statistically significant chosen motivated and learning strategies the study can be concluded, as it was expected, that in online learning cohort, with the increasing trend are the strategies that are among the most important for self regulated learning. Their absence and even the decreasing trend are noticed in the orientation during the choice of the motivated and learning strategies with the students who prefer face to face learning.

The results for the second subgroup showed the existence of statistically significant differences. Using the R^2 as the statistic of interest, an important shift in the relationships of the variables with the second year grade was identified. For the 55 students of second subgroup with pre-and post test scores, pre test MSLQ scores explained 23% of the variability in the second year grade.

At post test, the MSLQ scores explained 28% of the second year grade. But most dramatically, the change scores on the fifteen scales explained 39% of the variability in the second year grade. Statistically significant differences were found on : intrinsic goal orientation ($r = .36$, $p = .016$); control of learning beliefs ($r = .23$, $p = .042$); metacognitive self regulation ($r = .26$, $p = .049$); time and study environment ($r = .39$, $p = .021$); self- efficacy ($r = .19$, $p = .038$).

All of the significant changes were in a negative direction, indicating a decrease in scores at the end of the second year from the students' initial scores. Differences were not statistically significant ($p > .05$) for the changes in : extrinsic goal orientation; task value; test anxiety; rehearsal; elaboration; organization; critical thinking; effort regulation; peer learning or help seeking. The changes in learning strategies suggest that students who prefer face to face learning as a group were less likely to use some of the strategies that would help them to realize a higher second year grade.

Results for the second part of the study

The results for all four t-test in the second part of the study were significant ($p < .05$) indicating that there was a significant difference in means for all four variables and that the effects were in the direction stated in the hypotheses. Therefore, all four hypotheses were

confirmed. Hypothesis H_2 concerning relational satisfaction was confirmed (t = -3.22; p = .001).The computed mean for relational satisfaction in FtF was 3.82, while the mean for relational satisfaction in CMC was 3.43.

The means of 1.65 for FtF and 1.81 for CMC proved to be significantly different in the hypothesized direction, confirming hypothesis H_3, although the significance between the level of intimacy was comparatively low (t = -1.92; p=.04).

Hypothesis H_4 regarding inclusion was confirmed with means of 3.05 for FtF and 2.43 for CMC (t = -3.68; p = .0005). This hypothesis was confirmed at a very high significance level. Hypothesis H_5 concerning the level of attraction was lower in CMC than in FtF. The mean for attraction in FtF was 3.98, compared to 3.51 for CMC (t = -3.42; p= .0005). Therefore, hypothesis H_5, too, was confirmed.

Recommendations

Results and findings from the study provided empirical support for the preference of romantic face to face settings as opposed to CMC for the fulfilment of positive human relationships. Nonverbal communication is an essential part of human communication.

Systematic research of this kind might lead to a better understanding of the possibilities and limitations of a medium that could have large effects on the relationships we have in our lives.

Conclusion

Although the initial goal of the first part of this study was comparing online with face to face learning through comparison of learning strategies, the issue of intrinsic motivation and beliefs about one's own abilities to succeed were the significant relationships identified in this study. Increasing or decreasing scores in intrinsic motivation may indicate that pre-service teachers in the end of the second year may be still struggling to find the relevancy of what they are doing in the second year to their plans to be practicing teachers.

This study indicates that academic administrators and higher education decision makers may want to further look at ways to improve students' intrinsic motivation and self-efficacy. However, as this study suggests, students who do find affinity for the teacher school experience and enjoy the learning opportunity for its own sake, rather than for some extrinsic reward, actually reap the reward of better grades.

Additional study is necessary to make sense of the impact of self-efficacy on student achievement. Although the importance of self- efficacy is highlighted in the work of Bandura (1986) and others, it is impossible here to disentangle the issue of cause and effect from the relationship of self-efficacy and the second year grade.

Specifically, the difficulty comes from not knowing if the students whose performance had been good in the past were influenced to respond positively to the self-efficacy items or whether positive self-efficacy influenced future performance at the end of the year. What this study suggests is that through data collection activities and use of information from student records, it may be possible to identify students who might be at-risk of negative outcomes at pedagogical faculties.

Furthermore, during studying, the implementing of success factors in building the self-efficacy is stated to be a very important moment, both by teachers and students. Finally, this study reinforces the notion that research on student learning, especially using of motivated and learning strategy and their comparing through online and face to face learning, has the potential to provide classroom instructors, curriculum designers, and institutional planners with important information for decision making.

Self-regulated learners not only need to possess cognition (knowledge to build upon), and metacognition (the knowledge and monitoring of learning strategies), but they must also be motivated to use their metacognitive strategies to build upon their understandings of instructional material (Pintrich and De Groot 1990). The term self-regulated learning became more popular recently as it emphasizes the emerging autonomy and responsibility of students to take charge of their own learning.

What is important for teacher educators is that self-regulated learning can help to describe the ways that people approach problems, apply strategies, monitor their performance, and interpret the outcomes of their efforts. Using psychometrically sound instruments, involving students and faculty, and using the results seems an appropriate process for guiding the improvement of learning.

Efficacious self-regulators gain knowledge, skills, and intrinsic interests in intellectual matters. Given the influential role of psychological factors in whether and how educational technologies are used, one must guard against placing excessive hope in the technology itself. Learners need live mentors to help build their self-regulatory efficacy, cultivate their aspirations, and to find meaning and direction in their intellectual pursuits. Self-regulatory capabilities endure as personal resources for continued self- development. Results of the second part of this study provided support for all hypotheses. Findings from the study provided empirical support for the preference for face to face settings as opposed to CMC for the fulfilment of positive human relationships.

Relationships maintained in face to face settings are regarded to be more satisfying than relationships maintained through e-mail. This can be explained by the lower level of communication effectiveness in CMC due to a lack of redundancy of information elements usually provided by non-verbal cues. Even though the significance level for the intimacy variable was slightly lower than those of the other variables in this study, e-mail relationships were found to be less intimate than relationships in face to face settings. This can easily be explained by the fact that nonverbal cues such as touch have been equated with intimacy itself, demonstrating the importance of nonverbal communication for intimate relationships.

The same is true for perceptions of "inclusion of the other in the self". Less inclusion is felt in CMC relationships, at a very high significance level, indicating that the single channelled nature of CMC is inadequately suited to capture the multifacetedness of cues required for the establishment of empathic understanding and feelings of closeness. The participants in this study agreed that people also feel more attracted to relational partners with whom they interact in real world settings rather than in virtual environments. The lack of nonverbal cues seems indeed to be the reason for the lower quality of relationships maintained through e-mail.

The authors want to point it out that because only two types of relationships were compared, a sample size of 85 students was sufficient to obtain significant results. The study focused on dyadic, romantic, long-term, cross-gender relationships. Because subjects' self- reports were used as a measure for relational satisfaction, intimacy, inclusion and attraction, only perceived levels could be analyzed, and the views of only one dyadic partner were available. The findings are generalizable only to the population from which the sample was drawn.

Emotion is present in computer-mediated communication (CMC). People meet via CMC every day, exchange information, debate, argue, woo, commiserate, and support. They may meet via a mailing list or newsgroup, and continue the interaction via e-mail. Their relationships can range from the cold, professional encounter, to the hot, intimate rendezvous. Rheingold (1993) describes people in virtual communities as using the words they type on screens to : exchange pleasantries and argue, engage in intellectual discourse, conduct commerce, exchange knowledge, share emotional support, make plans, brainstorm, gossip, feud, fall in love, find friends and lose them, play games, flirt, create a little high art and a lot of idle talk (3).

In summary, it can be said that at its current developmental stage, CMC lacks both the breadth and depth required for the maintenance of satisfactory, intimate, close inter-personal relationships. This study found close human inter-personal relationships to be too vivid, ambiguous, and multi-channelled to be adequately captured by a single- channelled medium.

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