

Potential of using Computer-Mediated-Communication tools for After-School Learning

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Abstract: The paper explored the potential for after-school learning using compute-mediated-communication (CMC) tools. A survey involving 284 high school students were conducted to study the usage of CMC tools, the motives of using CMC tools and the relationship between self-esteem. The findings showed that students had the ability and motivation to exploit CMC tools for after-school learning. Beside, the motives of using CMC are closely related to self-esteem of students. Teachers are recommended to provide more guidance and encouragement to these students for learning via CMC tools.

Keywords: Computer-Mediated-Communication, after-school learning, motives of CMC

Introduction

The rapid growth of Web technology brings much convenience in the communication between people. In particular, the emergence of computer mediated communication (CMC) tools such as online discussion forums, emails, and social network sites (SNS) including blogs, microblogs accelerate the social interaction between people. CMC tools allow two or more people to interact and share opinions, photos or videos through the Internet at different points of time. Recently, different forms of CMC tools have been applied to teaching and learning. For example, different pedagogies exploiting blogs and microblogs have been developed to improve the learning performance of students [1,2]. Brady et al. shows that education-based SNSs can be used effectively in distance education courses as a technological tool for improved online communications among students in higher distance education courses [3]. Dunlap and Lowenthal describe the use of Twitter to encourage free-flowing just-in-time interactions, enhancing the social presence in online courses [4]. CMC tools become increasingly common among students, especially after normal school hours. However, studies were conducted to illustrate that CMC tools might pose negative effect on students' learning. For example, children lose the ability to pick up on nonverbal cues when they rely only on written text [5]. Studies also showed that Facebook users tended to spend relatively less time on study and achieve GPAs in the range of 3.0 to 3.5, while nonusers obtain GPA in the range of 3.5 to 4.0 [6,7]. On the other hand, after-school programs are found to be effective to improve students' academic achievement and communication skill. For example, Durlak & Weissberg showed that after-school programs could improve students' self-perceptions and bonding to school, their positive social behaviors, and their school grades and level of academic achievement [8]. In light of this, it raises the potential for adopting CMC tools as an after-school learning.

Researches were also conducted to study the relationship between personal characteristics and the usage of CMC [9,10]. Prior studies show that personality is one of the potential predictors for the use of CMC [11,12]. Elliso revealed that there was a strong association between Facebook usage and three types of social capital, namely, bridging social capital, bonding social capital, and maintained social capital [13]. Some studies reported that some students believed that their generation is not as good at learning as the pre-ICT generation, although they use the Internet and other ICT for school purposes [14]. With this regard, one of our objectives is to study the students' motives of using CMC tools to see w
In this paper, we aim at investigating the potential for adopting CMC tools for after-school learning. In particular, our research questions are as follows:

- What are the motives of using CMC tools of students?
- Is there any potential for adopting CMC tools for after-school learning?
- Is there any relationship between CMC usage and self-esteem?

1. Method

This study conducted a survey investigating the CMC usage and self-esteem. It involved 284 students in Hong Kong. Among these students, 127 students are male and 157 students are female; 177 students are junior high school students and 107 are senior high school students. Each participated student was asked to complete a questionnaire consisting of three sets of questions, which were adapted from related instruments. The first set of questions of the questionnaire was related to CMC genres, which asked students to indicate how frequency they used CMC genres in a 4-point scale ranging from 1 = "never" to 4 = "often".

The second set of questions was related to students' motives of using CMC tools. The students were asked to indicate their level of agreement with each item in a 4-point Likert scale from 1 = "strongly disagree" to 4 = "strongly agree". These questions related to students' motives of using CMC tools were adapted from [15]. These questions focused on two factors of students' motives of using CMC tools, namely the Socio-Affective Regulation (SAR) factor about a social or affinitive orientation toward Internet use; and the Goods-and-Information Acquisition (GIA) factor about a utilitarian or practical orientation toward Internet use [10,15]. In particular, the questionnaire items were as follows:

- Q2.1. keep in touch with parents or teachers
- Q2.2. keep in touch with classmates or friends
- Q2.3. just look around
- Q2.4. make new friends online
- Q2.5. talk to others, share feelings
- Q2.6. exchange information
- Q2.7. seek others' recognition
- Q2.8. escape from reality
- Q2.9. research on academic issues
- Q2.10. research on living issues

The next set of questions of the questionnaire was related to students' level of self-esteem. The students were asked to indicate their level of agreement with each item in a 5-point Likert scale from 1 = "strongly disagree" to 5 = "strongly agree". The question was adapted from the Rosenberg Self-Esteem Scale [16] with reliability coefficient α of 0.73.

TABLE I. STUDENTS' USE OF CMC GENRES

| CMC Genre | Never | Rarely | Sometimes | Often |
|-------------|--------|--------|-----------|--------|
| SNS | 3.52% | 6.34% | 21.13% | 69.01% |
| IMS | 3.87% | 11.27% | 30.63% | 54.23% |
| Email | 3.87% | 25.00% | 50.70% | 20.42% |
| BBS Forum | 19.01% | 31.34% | 31.34% | 18.31% |
| Online Game | 39.44% | 28.17% | 17.25% | 15.14% |
| Micro Blog | 52.82% | 23.94% | 13.03% | 10.21% |
| Blog | 48.94% | 33.10% | 12.32% | 5.63% |
| Chatroom | 52.46% | 30.28% | 13.03% | 4.23% |

2. Results and Discussion

Table I shows students' use of CMC genres. There was no student who had never used any one of the CMC tools before. As shown in the table, about 90%, 85%, and 70% of student frequently used SNS, Instant messenger (IMS), and Email for communication respectively. The majority of students were familiar with synchronized/asynchronized and private/public CMC tools to communicate. This indicated that students had the ability to acquire information and communicate with others online, leading to the potential for after-school learning using CMC tools.

TABLE II. STATISTICS OF STUDENTS' MOTIVES OF USING CMC TOOLS

| Motives | Whole sample | | Junior high school | | Senior high school | |
|---------|--------------|------|--------------------|------|--------------------|------|
| | Mean | S.D. | Mean | S.D. | Mean | S.D. |
| Q2.1 | 2.55 | 0.81 | 2.49 | 0.82 | 2.66 | 0.80 |
| Q2.2 | 3.57 | 0.56 | 3.59 | 0.59 | 3.54 | 0.52 |
| Q2.3 | 3.27 | 0.68 | 3.33 | 0.65 | 3.18 | 0.74 |
| Q2.4 | 2.17 | 0.87 | 2.24 | 0.86 | 2.06 | 0.87 |
| Q2.5 | 2.68 | 0.81 | 2.71 | 0.81 | 2.62 | 0.81 |
| Q2.6 | 3.14 | 0.64 | 3.13 | 0.67 | 3.17 | 0.60 |
| Q2.7 | 2.38 | 0.79 | 2.43 | 0.79 | 2.29 | 0.80 |
| Q2.8 | 2.01 | 0.84 | 2.09 | 0.85 | 1.87 | 0.81 |
| Q2.9 | 2.77 | 0.80 | 2.72 | 0.83 | 2.89 | 0.74 |
| Q2.10 | 2.79 | 0.75 | 2.73 | 0.74 | 2.89 | 0.74 |

Remark 1. 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree.

Table II shows the statistics of the students' motives of using CMC from the whole sample, junior high school students and senior high school students. Regarding the priority of the motives of using CMC tools, the top five motives in descending order were Q2.2 (keep in touch with classmates or friends), Q2.2 (just look around), Q2.6 (exchange information), Q2.10 (research on living issues), and Q2.9 (research on academic issues). As indicated, students mainly exploited CMC tools to communicate with peers and acquire information. The self-esteem of the students from the whole sample, junior high school, and senior high schools were 3.33 (S.D.: 0.59), 3.25 (S.D. 0.58), and 3.48 (S.D.: 0.59) respectively. The self-esteem of junior high school students was significantly lower than that of senior high school students (with $p < .01$). This observation was consistent with the ones reported in [17,18]. Self-esteem declines at the early adolescence stage and then increases at the late

adolescence stage. To study the relationship between different motives of using CMC tools and self-esteem, we calculated the Pearson correlation between different motives of using CMC and self-esteem. Table III shows the Pearson correlation coefficient between different motives of using CMC tools and self-esteem. As shown in the table, self-esteem is closely related to some of the motives of using CMC tools. This also is in line with findings that good use of CMC tools could probably lead to higher self-esteem as suggested in [19]. Self-esteem was positively related to Q1, Q2, Q9, and Q10, and negatively related to Q8. Students with lower self-esteem students were less likely to communicate with others and research on academic or living issues using CMC tools. They mainly treated CMC tools as a way to escape from reality. Self-esteem had no significant relation with any motives of using CMC tools for junior high school students. The difference between junior high school students and senior high school students is probably due to the fact that junior high school students, who are at the early adolescent transition stage, are influenced by many other factors such as personality, curiosity, enjoyment, parents and peer attachment [20,21]. On the other hand, senior high school students, who are at the late adolescent stage, have less guidance from parents and more social participation. Self esteem becomes a major factor for developing social skills [22].

TABLE III. THE PEARSON CORRELATION BETWEEN EACH INDIVIDUAL MOTIVE OF USING CMC TOOLS OF STUDENTS AND SELF-ESTEEM

| Motives | Whole sample | Junior high school | Senior high school |
|---------|--------------|--------------------|--------------------|
| Q2.1 | 0.23** | 0.15 | 0.34** |
| Q2.2 | 0.16** | 0.09 | 0.32** |
| Q2.3 | -0.07 | -0.06 | -0.04 |
| Q2.4 | 0.05 | 0.10 | 0.03 |
| Q2.5 | 0.00 | 0.06 | -0.08 |
| Q2.6 | 0.09 | 0.14 | -0.02 |
| Q2.7 | 0.00 | -0.02 | 0.09 |
| Q2.8 | -0.20** | -0.14 | -0.25** |
| Q2.9 | 0.16** | 0.07 | 0.27** |
| Q2.10 | 0.12* | -0.02 | 0.31** |

* $p < .05$, ** $p < .01$

Our study implies the need of after-school learning activities which aim at information acquisition through CMC between students. In this regard, teachers who incorporate CMC in after-school learning are recommended to design collaborative learning activities which ask students to exchange information on target topics through CMC tools with classmates or other people who can be helpful to their learning. Second, students with lower self-esteem are less likely to employ CMC tools to obtain useful information. Therefore, teachers are recommended to provide more guidance and encouragement to these students. Third, when considering incorporating CMC tool in students' after-school learning, teachers should consider which types of CMC can be more appropriate. From our study, social network sites (SNS) and instant message (IM) are suitable for after-school learning because students are familiar with these tools.

3. Conclusion

This study conducted a survey with 284 high school students to explore the potential of using CMC tools for after-school learning. The results indicated that the students had sufficient ability and motivation for after-school learning. Our study also showed that self-esteem was closely related to the motives of using CMC tools. This suggested that teachers are

recommended to provide more guidance and pay more attention to students with low self-esteem when designing after-school learning activities.

References

- [1] Ebner, M., Lienhardt, C., Rohs, M. & Meyer, I. (2010). Microblogs in Higher Education - A chance to facilitate informal and process-oriented learning? *Computers & Education*, 55(1), pp. 92-100.
- [2] Kim, H.N. (2008). The phenomenon of blogs and theoretical model of blog use in educational contexts, *Computers & Education*, 51(3), pp. 1342-1352.
- [3] Brady, K.P., Holcomb, L.B. & Smith, B.V. (2010). The Use of Alternative Social Networking Sites in Higher Educational Settings: A Case Study of the E-Learning Benefits of Ning in Education. *Journal of Interactive Online Learning*, 9(2).
- [4] Dunlap, J.C. & Lowenthal, P.R. (2009) Tweeting the Night Away: Using Twitter to Enhance Social Presence. *Journal of Information Systems Education*, 20(2), pp. 129-135.
- [5] Conrath, K. & Zeccola, J. (2009). Does social networking hurt student grades? *American Teacher*, 94(2), pp. 3.
- [6] Young, J.R. (2009). Facebook, Grades, and Media Hype. *Chronicle of Higher Education*. 55(33), A13.
- [7] Kirschner, P.A & Karpinski, A.C. (2010). Facebook and academic performance. *Computers in Human Behavior*, 26, pp. 1237-1245.
- [8] Durlak, J.A., & Weissberg, R.P. (2007). The impact of after-school programs that promote personal and social skills. *Collaborative for Academic, Social, and Emotional Learning*.
- [9] Spitzberg, B.H. (2006). Preliminary Development of a Model and Measure of Computer-Mediated Communication (CMC) Competence *Journal of Computer-Mediated Communication*, 11, pp. 629-666.
- [10] Pornsakulvanich, V., Haridakis, P. (2008). The influence of dispositions and Internet motivation on online communication satisfaction and relationship closeness. *Computers in Human Behavior*, 24 pp. 2292-2310.
- [11] Ross, C., Orr E.S., Jaime, M.S., Arseneault, M., Simmering, M.G. & Orr, R.R (2009). Personality and motivations associated with Facebook use. *Computers in Human Behavior*, 25(2), pp.578-586.
- [12] Zywicki, J. & Danowski, J. (2008). The Faces of Facebookers: Investigating Social Enhancement and Social Compensation Hypotheses: Predicting Facebook and Offline Popularity from Sociability and Self-Esteem, and Mapping the Meanings of Popularity with Semantic Networks. *Journal of Computer-Mediated Communication*, 14(1), pp.1-34.
- [13] Ellison, N.B., Steinfield, C. & Lampe C. (2007). The Benefits of Facebook "Friends:" Social Capital and College Students' Use of Online Social Network Sites. *Journal of Computer-Mediated Communication*, 12, pp.1143-1168.
- [14] Kolikant, Y.B.D. (2010). Digital natives, better learners? Students' beliefs about how the Internet influenced their ability to learn. *Computers in Human Behavior*, 26, pp. 1384-1391.
- [15] Weiser, E. (2001). The functions of Internet use and their social and psychological consequences, *CyberPsychology and Behavior*, 4, pp. 723-742.
- [16] Rosenberg, M. (1965), *Society and the Adolescent Self-image*. Princeton University Press, Princeton, NJ.
- [17] McCarthy, J. D., & Hoge, D. R. (1982). Analysis of age effects in longitudinal studies of adolescent self-esteem, *Developmental Psychology*, 18, pp. 372-379.
- [18] Armsden, G.C., & Greenberg, M.T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*, 16, pp. 427-454.
- [19] Zhao, L., Lu, Y., Wang, B., & Huang, W. (2011). What makes them happy and curious online? An empirical study on high school students' Internet use from a self-determination theory perspective, *Computers & Education*, 56(2), pp. 346-356.
- [20] Wigfield, A., Eccles, J.S., Mac Iver, D., Reuman, D.A., & Midgley, C. (1991), Transitions during early adolescence: Changes in children's domain-specific self-perceptions and general self-esteem across the transition to junior high school. *Developmental Psychology*, 27(4), pp. 552-565.
- [21] Shaw, L.H., & Gant, L.M., (2002). In Defense of the Internet: The Relationship between Internet Communication and Depression, Loneliness, Self-Esteem, and Perceived Social Support., *CyberPsychology & Behavior*, 5(2), pp. 157-171.
- [22] Riggio, R.E., Throckmorton, B., & DePaola, S. (1990). Social skills and self-esteem, *Personality and Individual Differences*, 11(8), pp 799-804.