Computer Mediated Communication: Social Support for Students with and without Learning Disabilities

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ABSTRACT

The study examined the relationships between the usage mode of four kinds of computerized mediated communication (CMC) by students with and without learning disabilities (LD) and perceived social and emotional support. Little is known about how undergraduate students with LD interpret and perceive CMC. We investigated the impact of the use of CMC as e-mails, internet, instant messaging (IM), SMS, and its contribution to social and emotional relationships among 364 undergraduate students without LD and 68 students diagnosed with LD, enrolled in a social science program, who completed two questionnaires. Findings pointed to higher usage of CMC to express social support, indicating that most of the students preferred using e-mails and SMS for that purpose. Students noted that IM is more useful for receiving social support, and e-mail is more useful for practical social advice. Students with learning disabilities reported using personal computers more frequently, especially for receiving practical advice. In addition, they reported using more IM compared to students without disabilities. The findings offer empirical evidence supporting the usefulness of CMC for mutual social activities and support, suggesting enhancement of positive support among students, and encouragement of more interaction between students, which might evoke more proactive coping strategies.

Keywords
CMC (computer mediated communication), social support, emotional support, learning disabilities

Introduction

For the last decade, we have witnessed a substantial increase in both the use of Computer Mediated Communication (CMC) and in the growth of social and emotional support amongst users of the different interfaces. The internet and CMC interfaces represent new methods of personal communications. Unlike ‘face-to-face’ relationships, geographical location is insignificant in this medium. The level of intimacy is determined by the length of time spent in the same chat room, forum, mailing list or website (Daum, 2007). Many studies have investigated the influences of the internet on peoples’ daily lives and on their social relationships (Cogat, Yamauchi, and Suman, 2002; Nie and Hillygus, 2002; Segerstad, 2002), but most of the studies referred to general use of the internet and not to the impact of the various interfaces in creating social and emotional relationships.

Computer mediated communication

The past decade has seen the rise of an alternative method of social support involving CMC interfaces, which include e-mail, chat, virtual communities, instant messaging (IM), text messaging (SMS), web pages etc. Social support is an integral part of a person’s environmental relationships and this has a significant influence on their quality of life.

This study seeks to examine the differences in the use of four interfaces – e-mail, SMS, IM, and chat – to relay messages of social support amongst students. Researchers reported that CMC was used primarily for interpersonal communications with family and friends. These interfaces have increased the users’ social involvement (Kraut, 2002; Shoklovski, Kraut, and Rainie, 2004), assisted them in maintaining contact with family and friends, and expanded their social network (Howard, Rainie, and Jones, 2002; Schiano et al., 2002). These interfaces have been especially effective in maintaining relationships amongst students (Cummings, Lee, and Kraut, 2006). An additional common interface is the mobile phone, which has led to changes in interaction patterns between social groups, as it enables intimate and direct communications at all times of the day, from anywhere, between members of a social network (Ling, 2004). A survey on the extent of digital media usage - internet, messaging, and SMS - was conducted by the World Health Organization amongst youth in 41 countries. Youth in Israel was ranked fourth in the world in use of digital media (HBSC, 2008). High use of IM and SMS in relaying social support messages, in comparison to e-mail and chat, was reported in a study that examined CMC usage patterns amongst teenagers. It was found that girls
preferred IM and SMS interfaces and were more inclined towards social support-type communications (Daom, 2007).

**Learning disabilities and computerized technology**

The current study addressed the population of students with learning disabilities (LD). The term *learning disabilities* refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, and/or mathematical abilities (National Joint Committee on Learning Disabilities, 1989). Similar to this definition and criteria, the Israeli Ministry of Education has defined learning disability, and students are usually identified as having an LD prior to their higher education studies. To be diagnosed, they will have obtained a Full Scale score of 85 or above on the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1991). In addition, individuals with LD must show significant difficulties in the acquisition and application of one or more of the following subjects: reading, writing, inference and mathematical ability, quantitative concepts, memory, and attention span, equivalent to standard scores of 80 or below on one or more of the Spelling, Arithmetic, and Reading subtests of the achievement test of the Wide Range Achievement Test – third edition (WRAT3; Wilkinson, 1993).

The development of technologies that assist students with LD has increased during the past decade. It was discovered that those students who used computerized technological systems improved their grades and learning skills, dropped out less, and reported an improvement in their quality of life (Raskind and Higgins, 1998). Computerized programs have served as a social and emotional intervention tool amongst children with various learning disabilities. For example, the use of computerized technologies allows students to express themselves, contributes to the development of reciprocal social connections between LD children and their non-LD peers, improves their general personal wellbeing (Dole and McMahan, 2005; Hall, Hughes, and Filbert, 2000) and provides a feeling of empowerment and an improved self-image (Lau et al., 2005). The current study deals with the social and emotional aspects of CMC, and focuses on support for those aspects among students with and without LD.

**Social support among students in higher education**

Social support refers to the individual's perception that he or she can be helped or can attain the understanding, cooperation, assistance, and appraisal of close or significant persons (Sarason and Sarason, 1985). Social support is often conceptualized as a protective factor in students' lives that contributes to students' successful adjustment to university (Solberg and Villarrreal, 1997). As mentioned by Nelson-Le Gall (1992), help seeking can be instrumental (e.g., student's need for additional explanation, to solve a problem) and/or can be for social and emotional help and support from a close person (Heiman and Kariv, 2004). Findings indicated that help seeking is a positive instrumental skill that encourages students’ attempts to obtain assistance (Nelson-Le Gall, 1992; Newman, 1994). A review of the literature examining successful academic adjustment of students in higher education and their perceptions of social support (Demaray and Maleck, 2002) suggests that the social support of parents and peers was associated with increased academic achievement of university and college students, has a positive effect on their psychological well-being (Winter and Ben-Knaz, 2000), and is related to a variety of academic and personal adjustments to college (Brissette, Scheier, and Carver, 2002; Winter and Sugar, 2000).

Over the past two decades, there has been an increase in the number of higher education students with LD (Griffin and Pollak 2009; Johnson, Zascavage, and Gerber, 2008). Success in new and complex assignments, both on an academic and social-personal level, is required to gain entrance to a university. It was found that the academic, social, and emotional adjustment of students with LD was lower than that of students without special needs (Adams, 2007). This is often accompanied by difficulties in reciprocal social relations, communication, cooperation, and in maintaining friendships (Moon et al., 2001), which is accompanied by a feeling of loneliness and social rejection (Heiman, 2006). The degree of social support correlates positively with the student’s academic success (Demaray and Maleck, 2002), strongly influencing their personal sense of wellbeing (Winter and Ben-Knaz, 2000) and their adjustment to the university environment (Brissette, Scheier, and Carver, 2002). Students with LD often reported a lower level of social support compared to students without special needs (Heiman, 2006); however, despite these difficulties, many students with LD adjust successfully to the academic requirements and do well in their studies (Heiman and Precel, 2003). Examining the perceptions of students with LD in higher education revealed three main topics which appear as a barrier to success: (a) being misunderstood, (b) needing to work harder than their nondisabled peers, and (c) seeking out strategies for success in education (Hazel, 2008). Other studies (Higgins,
Raskind, Goldberg, and Herman, 2002) found that emotional issues such as depression, unhappiness, being bullied, and teased, as well as high rates of loneliness, despair, anxiety, and low self-esteem were more frequent among students with LD (Gregg, Hoy, King, Moreland, and Jagota, 1992). Research on higher education students with LD have suggested that as they experience academic difficulties, they may also experience additional difficulties with stress management (Heiman and Kariv, 2004; Reiff, Hatzes, Bramel, and Gibbon, 2001), and display a significantly lower score on adaptability to cope with social demands and to deal with unexpected situations (BarOn, 1997). However, examining the experiences of students with LD revealed that students shared many life experiences and preferences for learning style irrespective of their type of LD, and reported similar experiences during education setting and with university support (Griffin and Pollak 2009). Interviews with successful college students with LD revealed family support, early identification, and good self-esteem as key to their competency (Johnson, Zascavage, and Gerber, 2008).

In sum, most of the studies focused on children's use of computers but did not examine additional technological interfaces, or the technological interfaces used by undergraduates. The first purpose of this study was to examine the impact of the use of CMC interfaces and its contribution to social and emotional relationships among undergraduates in different higher education institutes. As we are witnessing an increase in the number of students diagnosed with various disabilities studying in higher education institutes (Hagar and Goldstein, 2005; Harrison, 2004), our second purpose was to examine the differences between students with and without learning disabilities regarding the CMC interfaces.

**Method**

**Participants**

The study included 432 undergraduates Social Science students from two universities and one Teacher College in Israel. Participants comprised 391 women (91%) and 40 men (9%), aged between 20 and 39. The average age of the students was 26.32 years (S.D. = 6.93).

<table>
<thead>
<tr>
<th>Table 1. Students with and without Learning Disabilities</th>
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<tbody>
<tr>
<td>Students without Learning Disabilities</td>
</tr>
<tr>
<td>n = 364</td>
</tr>
<tr>
<td><strong>Age</strong></td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>S.D.</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td><strong>Institution</strong></td>
</tr>
<tr>
<td>Traditional university</td>
</tr>
<tr>
<td>College</td>
</tr>
<tr>
<td>The Open University</td>
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</table>

As presented in Table 1, 68 (15.8%) students reported being previously diagnosed with learning disabilities, while 364 (84.2%) were without learning disabilities. Most of the students who participated in the study were female (91%). Although the mean age of students with LD was higher than non-LD students, no significant differences were found, t = 1.67, p = .09. Most of the students are majoring in education (34.9%), or psychology (25.6%), others were studying in various social and behavioral science departments such as sociology, economics, management, political science (19.6%), or they were majoring in computers, or natural science (13.5), with a few (6.5%) majoring in the humanities (e.g. literature, history, art). No significant differences emerge between students' groups. The GPA of the sample was 81.52.

It was found that, of the entire sample, 43.8% of the students were studying in a traditional university, 33.8% at the Open University, and 22.5% in college. As can be seen, at the Open University, the percentages of student from both groups were similar. As for the traditional university, the percentage of students with LD was lower than the non-LD
students (25% vs. 47.4%), and in the colleges, the percentage of students with LD was higher than the non-LD students (39.7% vs. 19%).

According to the students with LD’s self-report, they were divided into three groups corresponding to their type of disability: attention deficit disorder (n = 26, 38.2%), reading and writing disorder (n = 24, 35.3%), combined disorders (n = 18, 26.5%).

**Procedure**

After receiving ethical approval from the university’s Ethics Board, participants were selected randomly from the department of Social Sciences and were given the choice of manual or computerized questionnaires. All measures were administered or submitted individually to each participating student by one of the researchers. All participants were informed that their participation was voluntary and their anonymity was emphasized. Based on students' answers, they were classified into the LD or non-LD group.

**Instruments**

1. **Personal details questionnaire** – the questionnaire contained 11 questions such as age, gender, technology ownership and questions regarding the existence and type of learning disability.
2. **The effect of technology on humans questionnaire (Kraut, 2002)** — the questionnaire contained 38 Likert Scale questions which examined the frequency of use of CMC and its use for social support. The questionnaire, as reported and validated by Daum (2007), contained three indices:
   a) *The participants’ opinions regarding the efficacy of communication in social areas* - examined the efficacy of communication in performing actions, developing and maintaining social connections, exchange of information, the level of pleasure derived from a conversation and the level of closeness towards the other party. The overall level of reliability of the summative index was 0.61.
   b) *The main topics of conversation and the connection with the other party* – examined four supporting factors (reliability ranges = 0.68-0.71): Social Support Partner – including topics such as giving and receiving advice, giving and receiving support, planning and organization, discussing problems, asking a favor and the exchange of information. Negative Partner – argumentative/controversial topics, persuasion, complaining and gossip. Small Partner and Catch-up – small talk topics, jest/laughter, work or school related topics, a day’s summary, and areas of interest and memory recall. Relationship Partner – memory recall and keeping up-to-date, small talk, jest/laughter, work or school related topics, a day’s summary and areas of interest, acquaintanceships, romantic communications and communication with friends.
   c) *The frequency of mutual social activities* – examined by four types of activity in which the participants were requested to rank the frequency of each activity in accordance with the relative interface type. The following activities were examined: participating in mutual activities, talking about hobbies or mutual topics, receiving appropriate assistance, receiving emotional support (alpha = 0.70).

**Results**

**CMC usage.** Analyzing undergraduates' answers, it was found that all the participants possessed a mobile phone. All the students with LD had access to a home computer, 52.9% of them had their own personal computer, whereas only 38.9% of students with no disabilities had access to a computer, and 37.6% of them had their own personal computer. Most students had a broadband internet connection. Regarding the participants’ interface preference: over half the participants (53%) reported frequent use of SMS, about one third (34%) mentioned the use of e-mail, and a smaller proportion (12.8%) the use of IM. Only one participant reported using the chat interface, therefore this interface will not be included in the analysis presented below. Regarding specific interface type preferences, there were no significant differences between those students who had learning disabilities and those who did not.

Regarding the participants ages, significant correlations were found between student's age and the interfaces used, such as higher use of e-mail ($r = .11; p <.05$), and the lower use of SMS ($r = -.22; p <.01$) and IM ($r = -.13; p <.01$). No significant correlation was found between age and frequency of usage of the chat interface ($r = -.04; p >.05$).
Regarding gender, female students were more inclined to use SMS ($t = -2.83; p < .01$). No significant differences were found amongst the other interfaces.

The contribution of the use of CMC interfaces, e-mail, chat, IM, SMS, to convey messages of social support amongst students with and without LD. The level of social support was examined through three indices:

a) The participants’ opinion regarding the efficacy of communication in social areas
b) the main topics of communication (support factors)
c) the frequency of expression of social support

a) The efficacy of communication. In order to examine the differences between three interface types and its impact on the efficacy of communication, univariate analyses of variance (ANOVAs) were performed, and a t-test for independent models (per group type), the interface and group types were tested for any impact they may have on the efficacy of communication.

Table 2: Average ratings of the efficacy of communication in the social field, by interface type

<table>
<thead>
<tr>
<th>Interface Type</th>
<th>The efficacy of communication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SMS</td>
</tr>
<tr>
<td>IM &gt; @, sms</td>
<td>5.96**</td>
</tr>
<tr>
<td>IM &gt; sms @</td>
<td>20.31**</td>
</tr>
<tr>
<td>IM &gt; sms, @</td>
<td>7.25**</td>
</tr>
</tbody>
</table>

Note: ** p < .01

As Table 2 shows, results revealed significant differences between the different interface types in the efficacy level of the communication. In the summative index, IM has the highest communication efficacy compared to SMS and e-mail. The Scheffe test revealed a significant source gap between IM and e-mail and SMS. IM is the leader on the social level, followed by SMS and finally e-mail. The Scheffe test indicates distinct differences between the three interface types. In practice, e-mail ranks first compared to IM and SMS. Additionally, the Scheffe test shows a prominent gap between e-mail and SMS. Regarding the efficacy of communication between students either with or without learning disabilities, there were no differences in any of the three indices.

b) Examining the primary topics of communication (support factors). A one-way test with repeated measures between the communication topics was conducted. Results revealed significant differences in the frequency of different communication topics, $F (2, 414) = 378.28; p < .01; \eta = .47$. The Bonferroni test revealed significant gaps between the four communication topics. The most common topic was social support partner, followed by small partner and catch-up. Negative partner and relationship partner were less common.

Additionally, the influence of the interface type on the support factors was tested with a one-way ANOVA test (per interface type) and the t-test for independent models (per group type).

Table 3: Average ratings of the support factors (main topics of communication), by interface type

<table>
<thead>
<tr>
<th>Interface Type</th>
<th>Social support factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SMS</td>
</tr>
<tr>
<td>IM &gt; @, sms</td>
<td>1.61</td>
</tr>
<tr>
<td>IM &gt; sms @</td>
<td>10.54**</td>
</tr>
<tr>
<td>IM &gt; sms, @</td>
<td>30.81**</td>
</tr>
<tr>
<td>IM &gt; sms &gt; @</td>
<td>32.01**</td>
</tr>
</tbody>
</table>

Note: ** p < .01

As illustrated in Table 3, there are significant differences between the interface users in relation to three of the four communication topics; negative partner, small partner and catch-up, relationship partner. In all of these topics, IM is rated as the interface with the most frequent communication, followed by SMS and finally e-mail. The Scheffe test
showed that for each communication topic, the significant contrast was obtained due to the gaps between the three different interface types. There were no distinct differences in any of the communication topics between students either with or without learning disabilities. A significant interaction between the interface type and the relationship partner topics was noticed when checking the differences within the group of LD students, \( F = 4.17; p < .05 \). The frequency of relationship partner topics in the e-mail and IM interfaces was higher amongst participants with combined disabilities and lower amongst those with reading disabilities. On the other hand, the SMS results showed a higher frequency of communication amongst those with reading disabilities and a lower frequency amongst those with combined disabilities.

c) Frequency of expressing social support. Examining the five action types regarding the frequency of the different activity types (see Table 4), it was found that receiving useful advice/information and communications on hobbies/mutual topics occurred more frequently than receiving emotional support, practical assistance and mutual activities, \( F = 65.49; p < .01; \) Eta = .39. The Bonferroni test showed significant gaps between the two with the highest rating and the three with the lowest rating.

A one-way ANOVA analysis was performed to test the differences between the interface types relative to the activity types. From Table 4 it appears that SMS users are more inclined to participate in mutual activities whereas this occurs less frequently when using the other interfaces. Compared to e-mail users, SMS and IM users are more inclined to communicate on mutual topics and hobbies, receiving emotional support and practical advice. The Scheffe test indicated significant differences between e-mail, SMS and IM. On the other hand there were no significant differences between the various interfaces on the receipt of practical advice.

### Table 4: Average ratings for mutual activities, by interface type

<table>
<thead>
<tr>
<th>Interface Type</th>
<th>Mutual activities</th>
<th>SMS</th>
<th>IM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contrast</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>sms &gt; @, IM</td>
<td>4.64</td>
<td>1.88</td>
<td>3.90</td>
</tr>
<tr>
<td>@ &lt; sms, IM</td>
<td>5.47</td>
<td>1.88</td>
<td>4.30</td>
</tr>
<tr>
<td>----</td>
<td>4.58</td>
<td>1.69</td>
<td>4.30</td>
</tr>
<tr>
<td>@ &lt; sms&lt; MI</td>
<td>5.22</td>
<td>2.05</td>
<td>3.78</td>
</tr>
</tbody>
</table>

Note: ** p < .01

The t-test showed that students with LD reported receiving practical advice more frequently than non-LD students, regardless of the interface type being used, \( t = -1.74; p = .04 \). There were no significant differences between the groups in the other indices. In the two-way analyses (MANOVA) X (3 disability types) X (2 by (5 interface)) there were no significant differences between the participants, according to the interface and disability types, relative to the implementation of mutual activities.

**Discussion**

The study examined the usage differences between e-mail, SMS, IM, and chat amongst students with and without learning disabilities. In addition, the study checked whether the students had a preferred interface for conveying social and emotional support. The results of the study indicated a high usage level of CMC interfaces to convey social support, with a preference for e-mail and SMS. The students rarely used chat to convey social support, a statistic that was also revealed in Daum’s study (2007) amongst teenagers. Previous studies revealed a pronounced preference in the use of CMC for social purposes (Kraut, 2002; Schiano et al., 2002; Shoklovski, Kraut and Rainie, 2004), especially in maintaining relationships amongst students (Cummins, Lee and Kraut, 2006).

Regarding the interface types and their qualities, e-mail and SMS are more personal when a single member of a social network is selected for the communication. This fact enables intimate and direct communication at any time, from any place and for any reason. As was tested in this study, intimate use is especially essential for social support and it seems that this is one of the reasons for the students’ preference for these interfaces. In essence, chat is
collective, whereas IM may be used collectively or personally according to the user’s preference; a person answering a call may be invited for a private conversation (Boneva et al., 2005). Another explanation is the popularity of SMS. By enabling direct intimate communication regardless of time and place, the mobile phone has led to a change in interaction patterns of social groups (Ling, 2004). The current study found that all students possess a mobile phone. In today’s world the mobile phone is a vital instrument amongst adults and has become a fashion accessory that reflects social status. The study checked the mutual activity types in which CMC was used and found that students frequently use SMS for all mutual activities, whereas e-mail users reported a lower usage frequency. This finding is partially supported in previous studies which focused on different populations. For example, when social support in CMC in interface types amongst teenagers in Israel was tested, there was an obvious preference for the IM and SMS interfaces in two areas: the effectiveness of the communication and the main subjects for discussion (Daum, 2007).

Regarding learning disabilities, there were imparities between some of the subjects tested. It was evident that LD students require the assistance of a computer in their lives; they all had computers at home compared to only 40% of students without learning disabilities. All of them reported a similar usage of the different interfaces, with a higher IM usage level reported amongst LD students. It is difficult to know the reason for the gap between students with and without learning disabilities as there was no test to check if the use of this interface was collective or personal. Additional differences were found in the main support factors (communication subjects) discussed. Regardless of the interface type, the receipt of practical assistance is slightly more frequent amongst LD students than amongst those without. It seems that, due to adjustment difficulties, students with learning disabilities require more practical assistance. Studies have proved that the academic, social and emotional adjustment of students with special needs, such as learning disabilities, is lower in comparison to students without special needs (Adams, 2007; Heiman, 2006). In this study, students with learning disabilities were divided into two groups: those with attention deficit or reading disabilities, and a minority with a combination of disabilities. It was apparent that the disability type did not influence the student’s perception of the level of social support according to the type of interface. On the other hand, there was a difference in the support factors (communication topics), according to the type of disability and activity type. Within the limitations of this preliminary study, one can see that with regard to communication topics, students with attention deficit preferred the use of e-mail, whereas students with reading disabilities preferred SMS which required less reading and writing. Many studies have discovered that attention deficit is delayed when using a computer and that the computer provides assistance to children with this disorder (Navarro et al., 2001; Shaw, Grayson and Lewis, 2005; Shaw and Lewis, 2005). It is interesting to note that there were gender differences in the study which indicated that female students were more inclined to use SMS. This finding strengthens Daum’s study (2007), which revealed that women are more inclined to have social support conversations and that they preferred the IM and SMS interfaces.

In conclusion, it appears that the use of CMC constitutes a communication method for conveying social messages, including social support, amongst both LD and non-LD students. It is therefore important to pay attention to the provision of CMC facilities to students so they can receive and express social and emotional support. It seems appropriate for all students, but necessary for LD students who suffer from social and emotional deficiency, and frequently don't receive any support. It seems that CMC usage can enhance that support significantly.

In addition to the primary definition of the usage types for each interface reported by the students, the study may also be of interest to software developers who want to direct their applications to student use and utilization of the application’s social potential.

References


