The selection of instant messaging or e-mail
College students’ perspective for computer communication

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Abstract
Purpose – Instant messaging and e-mail are popular communication methods on college campuses. However, students’ perceptions of the two technologies vary greatly. This study seeks to investigate the differences between instant messaging and e-mail.

Design/methodology/approach – A survey was given to 545 college students.

Findings – Instant messaging is perceived as offering many advantages over e-mail including conveying emotions, building relationships and ease of use (EU). Users are more likely to use symbols with their instant messages to help communicate. College students find both technologies to be easy to use, but show a preference for the EU of instant messaging. However, despite its perceived functional benefits, instant messaging is only the favored form of communication for personal and social relationships.

Originality/value – This paper builds on existing research by discussing information richness, EU, the use of emotions, multimedia, playfulness, flow, cognitive fit theory, bounded rationality, perceived commitment, and user satisfaction in the course of the study.

Keywords Computer applications, Communication, Electronic mail

Paper type Research paper

Introduction
E-mail and instant messaging are popular communication technologies on college campuses. Students are using these technologies to trade messages with friends, keep in touch over distance, communicate on work-related projects and exchange new ideas. While studies show that face-to-face relationships are still perceived as being more valuable than either method in developing relationships, both are increasingly being used to communicate in social and work environments (Huang and Yen, 2003; Parks and Floyd, 1996; Parks and Roberts, 1998; Pascal, 2003). Computer mediated communication has been widely studied, with much research focusing on e-mail, it simply has been in use longer than instant messaging (Isaacs et al., 2002). Recently, there has been a surge of research on instant messaging looking at its effects in both social and work related environments (Lenhart et al., 2001). This paper will look at
college students' perceptions of both e-mail and instant messaging for conveying emotions, aiding relationships, usage and reliability.

E-mail is a popular communication tool. IDC Research projects that the total number of e-mail messages sent daily will exceed 60 billion worldwide by 2006. In 2002, CyberAtlas found that the internet is the primary mode of communication for US teenagers. About 91 percent of those aged 18-19 use e-mail. A 2001 Gallup poll found that nine in ten respondents use e-mail at home while eight in ten use it at work.

Instant messaging has quickly spread as a popular communication tool. Introduced in 1996, IDC Research now predicts that the instant messaging market will reach $4.2 billion by 2006. According to Nielson Netratings, by 2002, nearly 40 percent of online households in the USA were logging into a public instant messaging network at least once a month. The same study also found that nine out of the top ten online destinations for children and teenagers were instant messaging tools and services.

Rather than looking at e-mail and instant messaging independently, this paper will compare student perceptions of the two technologies. The study hopes to answer some fundamental questions: are instant messaging and e-mail useful for similar types of communication? Is there a user preference when communicating in social and work settings? Is either technology superior when attempting to convey emotions?

Evolution of instant messaging
Instant messaging was introduced in 1996 with the introduction of ICQ software by Mirablis. Upon registering with ICQ, the user is given a universal internet number, UIN, which allows the individual to be uniquely identified upon log-in. Your profile can be updated with personal information and a list of contacts, a “buddy list.” Once the user has accessed the internet, ICQ will share the connection with other ICQ users, updating the “buddy list” when contacts are available (www.icq.com). The technology was quickly adopted by young people as a communication method and its popularity has continued to grow (Huang and Yen, 2003; Schiano et al., 2002; Fang, 2003).

Instant messaging has undergone rapid growth and estimates predict that growth to continue in the future. IDC Research estimates that the instant messaging market will increase from $1.1 billion in 2001 to $4.2 billion in 2006. The Radicati Group estimates that the active instant messaging accounts will grow from 590 million in 2003 to more than 1.4 billion in 2007. Those estimates include both social and work related instant messaging accounts.

Instant messaging possesses several characteristics that distinguish it from e-mail. It allows real time communication, usually between two parties. Users are able to synchronously communicate by delivering point-to-point text messages (Segerstad and Ljungstrand, 2002; Grinter and Paylen, 2002). E-mail also allows point-to-point communication, usually between two parties. The information is not transmitted real-time, instead using a server for storage until the recipient is able to retrieve the content. Additionally, an increasing number of graphical emoticons are available to users of instant messaging (Figure 1). Vendors and users are continuously creating and increasing the pool of available emoticons. The process is like creating a new language dedicated for expressing human emotions.

Presently, the major instant messaging services are provided by: AIM® from AOL® (which now also operates ICQ), Yahoo Messenger® from Yahoo® and MSN Messenger® from Microsoft®. To this point, the different services use proprietary
protocols and thus are not able to be used in conjunction with one another. To eliminate this incompatibility issue, the Internet Engineering Task Force is working on a universal protocol that would allow these services to be used together.

**Literature review**

The present study investigates the potential effects of IM versus e-mail on college students. Variables from various dimensions are investigated in the study. In the following section, relevant literature is reviewed, including research on information richness, ease of use (EU), use of emoticons, multimedia, playfulness, flow, cognitive fit, bounded rationality, media selection, perceived commitment and user satisfaction.

**Information richness/communication quality**

Since, IM is a computer-mediated communication (CMC) tool, it makes sense to review and understand the fundamentals of CMC. An important theory and research subject regarding the quality of communication via computer-mediated channels is the information richness theory (IRT). IRT, which has benefited from a great deal of work from researchers in both the communications and information systems fields (Webster and Martocchio, 1993, 1995; Potter and Balthazard, 2000; Tan et al., 1998; Tyran et al., 1992), has been the focus of many studies related to organizational communication and technology-based communication.

Information richness is the ability of information to change a recipient’s understanding within a given amount of time (Webster and Martocchio, 1993). In other words, “rich”
information can change a recipient’s understanding more quickly than “lean” information, which will change the recipient’s understanding, but will require more time to achieve the same result. However, many factors may affect the ability of a medium to transmit rich information. IRT argues that a medium capable of providing immediate feedback is better than a medium that only provides unidirectional communication, and that a medium that carries more cues (e.g. expressions, gestures, tones, etc.) is a better choice than one that carries fewer cues. Based on these IRT assumptions, e-mail is a leaner medium because it does not support the same level of communication richness offered by other forms of communication, such as face-to-face conversation. The main reason for this argument is that e-mail is text-based, and therefore is incapable of transmitting non-textual cues such as facial expressions, body language, or vocal tones. Besides, e-mail is asynchronous, and does not allow for immediate response. IRT also assumes that richness remains constant for a given medium (Webster and Martocchio, 1993), meaning that e-mail would remain a lean medium regardless of other factors in the communication process or the communication’s context.

A different but related theory is the social presence theory. Social presence is the perception of physical presence during an interaction. Different media offer different levels of social presence. The choice of a medium is based on the need for social presence during a particular task (Zack and McKenney, 1995). Using this assumption, an individual would likely choose e-mail as the communication medium if there were no perceived need of physical presence to accomplish the task. For example, e-mail is often used to make announcements such as meeting schedules, but face-to-face meetings are deemed a more appropriate medium of communication if there is a need for more social contact (i.e. sales representatives preferring to meet clients in person to solicit new business).

Despite the popularity of IRT among researchers, several empirical studies have found evidence that does not agree with IRT’s assumptions and suggestions. Such studies show that e-mail (a lean medium according to IRT) is indeed capable of supporting rich information exchange (Dailey and Steiner, 1998; Potter and Balthazard, 2000). Attempting to explain this empirical evidence, Lee (Potter and Balthazard, 2000) conducted a qualitative analysis of e-mail communication within an organization. He concluded that e-mail users employed varying techniques to overcome the limitations of the medium and to convey rich information in a non-traditional way. In other words, e-mail was seen to be neither a rich nor a lean medium. Communication richness depended on the interaction between the medium and its users. For example, receivers of e-mail messages did not need to be passive recipients – they could be active participants by creating meanings based on the text messages. Therefore, the same e-mail tool might be a rich medium for users in one organization, but a poor medium for those in another.

Another perspective that might be used to explain the counter evidences of IRT is the adaptive structuration theory (AST) (Qureshi, 1995; Weisband et al., 1995). AST suggests that the symbolic features of communication media are evolving characteristics rather than constants. Therefore, the characteristics of a medium may change according to organizational cultures and other environmental factors. E-mail, for example, might be viewed as a less formal medium than face-to-face meetings in one organization, but might be seen as a formal mode of communication in another. Under the assumptions of AST, organizational members communicating with
one another constantly produce and reproduce new structures and actions while interacting and using various communication technologies. These structures and actions are produced both by the influence of the technology and by the social environment of the group (Olaniran and Williams, 1995; Csikszentmihalyi, 1990). In other words, media technology and communication structure continuously transform each other through interaction.

A similar perspective to AST is the social influence model, which argues that the properties of a medium depend on the individual using it and the social context in which it is used. AST also contends that the selection of a medium is not always a rational process and depends on the influence of groups or friends (Kock, 1998).

Ease of use and usefulness
Another relevant theory is the technology acceptance model (TAM). TAM is a model that explains the use, the intention to use, and the acceptance of new technology. The purpose of TAM is to track the impact of external factors on users' internal beliefs, attitudes, and intentions (Dailey and Steiner, 1998). The two predictors of IT usage in the TAM are perceived usefulness (PU) and perceived EU. PU is a user's subjective probability assessment of a technology application’s potential contribution to his or her job performance. EU is a user’s subjective assessment of the amount of effort required to learn to use a particular technology. The assumption of the model is that both PU and EU affect users’ attitudes toward a new technology, which in turn affects its actual usage. Through a series of experiments, the TAM came to three conclusions: first, technology use can be predicted reasonably well from user intentions. Second, PU is a major determinant of people’s intentions to use computers. Third, perceived EU is a secondary determinant of the intention to use computers. These results were promising – they indicated that the TAM is useful for evaluating technology applications in their early stages of development (Weisband et al., 1995).

Use of emoticons
Emoticons have a major role in IM communication. The creation and use of emoticons is an attempt to replace the lost facial cues in certain CMC. Originally, emoticons are symbols composed by letters and special characters. Emoticons normally need to be viewed sideway from the right. For example, frequently seen text-based emoticons include smile, sad, cry, and others (Figure 2). Recently, an increasing number of graphical emoticons are available to users of IM as a result of improved e-mail capabilities (Figure 3). Vendors and users are continuously creating and increasing the pool of available emoticons. The process is like creating a new language dedicated to expressing human emotions.

<table>
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<tr>
<th>EMOTICON</th>
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<td>:-)</td>
<td>Happy</td>
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<td>Cry</td>
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Figure 2. Text-based emoticon examples
Preliminary research results have shown a positive impact on the communication process with the use of emoticons (Rivera et al., 1996). A recent study found that both female and male users are equally likely to use emoticons. In addition, both females and males exhibit an increase in the frequency of emoticon use, rather than females muting emotional expression as with face-to-face interaction. In addition, females were found to use emoticons mostly for humor, whereas males tended to use emoticons to express teasing and sarcasm (Wolf, 2000).

Emoticons are effective shorthand symbols designed to convey specific attitudes, moods and emotions on the internet (Kay, 2002). They provide the electronic gestures and convey the warmth that is apparent in face-to-face communications. They also add breadth to the message (Blake, 2000). Rules in e-mails regarding emoticons and abbreviations are not standardized. Symbols can convey voice inflections, facial expressions and bodily gestures over the internet. Emoticons can be effective in conveying nonverbal cues between computer users and influence of these emoticons that can be used as substitute for face-to-face communication (Walther and D'Addario, 2001).

**Multimedia**

The use of emoticons adds a graphical dimension, and therefore qualifies instant messaging as a multimedia communication tool. In the past decade, multimedia applications have appeared in many areas such as computer-based training, business presentation, merchandising, and communications (Finholt and Sproull, 1990; Kock, 1998; King and Weidong, 1997). There have been many investigations into the
effectiveness of multimedia use, particularly in a learning environment (Kock, 2001). Studies have demonstrated that multimedia significantly improves comprehension, and even increases users’ problem-solving capability (Weisband et al., 1995). Many previous studies have found multimedia training methods to be more effective than traditional training methods. Other studies have shown that multimedia users had a higher retention rate and a shorter learning curve (Jarvenpaa et al., 1988). Still other findings have indicated that multimedia training is generally more effective than conventional training for enhancing subjects’ knowledge, performance, and retention. The effect of multimedia was also found to be non-industry-specific (Finholt and Sproull, 1990).

**Playfulness**

The ability to enjoy work and treat work as play is often viewed as a characteristic of successful adult learners (Carroll and Mack, 1984). One measure of such ability is playfulness, which describes a user’s tendency to interact with computers spontaneously, inventively, and imaginatively (Webster and Martocchio, 1992). In other words, a playful user tends to explore new ways of using computer systems with creative approaches. They may also be less afraid of making mistakes and therefore do not always follow instructions. Many microcomputer applications encourage a playful attitude, because they are easy to use, responsive, and customizable (Starbuck and Webster, 1991). Studies showed that the potential advantages of playfulness include increased involvement, positive mood, and satisfaction (Csikszentmihalyi, 2000; Sandelands et al., 1983; Webster and Martocchio, 1992). Potential negative effects of playfulness include longer time to completion (Sandelands, 1988), and over involvement (Csikszentmihalyi, 2000). Users with high computer playfulness may become unproductive if they spend too much time playing games.

**Flow**

A related construct to playfulness is flow. Flow is a useful construct for understanding and studying human interaction with computers. Flow characterizes human-computer interaction as a playful and exploratory experience (Webster et al., 1993). According to the flow theory, flow is the feeling of “in control of our actions, master of our own fate … we feel a sense of exhilaration, a deep sense of enjoyment” (Csikszentmihalyi, 1990). Flow can occur when there is a balance between task demands and the capability of the individual. For example, overly challenging tasks produce anxiety instead of flow. On the other hand, overly simple tasks produce boredom rather than flow. Flow can be measured using four different dimensions: control, attention focus, curiosity, and intrinsic interest in the interaction (Csikszentmihalyi, 2000; Trevino and Webster, 1992; Webster et al., 1993).

In human-computer interaction terms, control refers to users’ ability to direct the computer to do what they want. For example, some web sites force users to re-enter information when the BACK button is used in navigation. Users are often frustrated by the inability of the system to retain the information already entered. Other web sites might allow users to go back and forth between pages without losing previously entered data. In such cases, users feel that they have more control over the interaction. Attention focus is the extent of concentration which users exhibit in the interaction. A computer user in flow may lose self-consciousness and become more absorbed in the activities (Csikszentmihalyi, 2000). An individual’s level of curiosity is higher in the flow state (Malone, 1981). Computer systems with more functions for users to explore
tend to stimulate higher curiosity. In the flow state, users also find the activities intrinsically more interesting. In terms of human computer interaction, users might find new and powerful computer applications interesting or fun to use. Flow has been found to correlate with work outcomes and effectiveness. In addition, flow is also positively correlated with the perception of flexibility, experimentation, and expected use of the technology (Csikszentmihalyi, 2000; Trevino and Webster (1992).

Cognitive fit theory
Another theoretical perspective regarding the potential impact of IM on group tasks is the cognitive-fit theory (Csikszentmihalyi, 2000; Baroudi and Orlikowski, 1988). The cognitive fit theory argues that, to be effective, the representation of a problem, the desired solution to the problem and the recommended method for solving the problem should all be presented to the subject using the same illustrative technique. In other words, when there is a good “fit” between the problem representation, the solution, and the method, the problem-solving process will be more efficient and accurate because the problem solver does not have to mentally transform some of the information in the equation into a different modality that is more suitable for the task. For instance, if a task required the acquisition of spatial information, a spatial problem representation would likely simplify the problem-solving process. Therefore, because IM offers different capabilities than e-mail and other CMC tools, there may be a cognitive effect. As a result, the use of IM results in changes of the task outcome and user perception.

Bounded rationality
Another category of relevant previous research includes studies based on the bounded rationality theory. Bounded rationality is a well-researched theory that explains the information gathering behavior of decision makers (Kraut et al., 1998; Hiltz and Johnson, 1990). According to the bounded rationality theory, decision makers often are faced with complex situations that require the intake of a large amount of information before making a decision. Yet, practical constraints and cognitive limitations often restrict decision makers from obtaining all the information they need to make good decisions, and so they make decisions with whatever information they have available under the circumstances (Treviño et al., 2000).

Based on the bounded rationality theory, IM may affect decision makers’ behavior due to a different communication pattern and amount of information received when compared with e-mail.

Tasks and media selection
Similar to the cognitive fit theory, previous research shows that different tasks require different media to achieve best results. For example, activities that require convergent communication, such as organizing ideas and building consensus normally call for verbal discussion and clarification of issues. On the other hand, in cases that the objective was to collect ideas, electronic communication channels are preferred by managers (Tyran et al., 1992).

Perceived commitment
Perceived commitment to a group task is an important measure of group member satisfaction. The relationship between perceived commitment and the contribution of
peer group members and the use of CMC has been investigated in previous research. Research results show that groups that used computer-mediated group decision support systems produced a significantly higher level of perceived contribution (Dailey and Steiner, 1998).

**User satisfaction**
Implementing a new technology in a business environment is always a risky venture. Objective measurable outcomes are rarely available. The question about the success of a system implementation often cannot be answered using a simple “yes” or “no”. A particular system may be viewed as a success by some users, while viewed as a failure by the others. Therefore, a more subjective and less discrete measure, a user satisfaction level that ranges from low to high, has been used extensively as an important gauge of IS success. Using survey methods, users provide their subjective assessment of their attitude toward the system and gauge how satisfied they are with the system (McHaney et al., 2002). User satisfaction is easy to use but has its flaws (Melone, 1990 in McHaney et al. (2002)). However, the preponderance of empirical evidence show that user satisfaction is still a useful measure of system success.

**Research model**
This study was designed to explore the pertinent beliefs on the differences of using instant messenger services and e-mail. Owing to the differences between the two technologies highlighted above, user perception should vary greatly. In order to look at a broad range of perceptions, questions were structured around four categories: the ability to convey emotions, aid in building relationships, EU and reliability (Figure 4).

**Research methodology**
A survey of 69 questions was given to MIS students at a Midwestern University during the 2005 academic year. One thousand surveys were distributed with 545 of those being properly completed and returned. Participation was voluntary and all
participants were given at least 15 minutes to complete the survey. Both, verbal and written instructions were given to the students.

The pre-phase of the research consisted of designing the survey using Likert scaling. Once the four categories (emotion, relationship, usage and reliability) had been determined, questions were written for a pilot study, which was given to the authors and selected colleagues and students. The post-phase of the study consisted of an evaluation of the linguistics, ensuring that the verbiage of the questions was proper, easy to comprehend and not misleading. A complete list of questions can be found in Table I.

Analysis

Conveying emotions

The questions in this section, all dealt with how effectively the different technologies conveyed feelings and emotions. While the results show that both instant messaging and e-mail communicate more than just text, there is a clear preference for instant messaging for communicating emotions.

The responses to questions 1 and 4 clearly show a preference to use symbols with instant messaging to show feelings and emotions. Over 12 percent of all respondents strongly agreed, while 40 percent agreed, that they use symbols with instant messaging. Comparatively, less than 2 percent strongly agreed, while fewer than 9 percent agreed, that they use symbols with e-mail (Figure 5).

Questions 2 and 5 dealt with the use of symbols by friends to convey emotions and feelings. More than 70 percent strongly agreed, or agreed, that their friends use symbols while instant messaging. Likewise, fewer than 14 percent agreed that their friends use symbols with e-mail.

Questions 3 and 6 also compared the level of emotions conveyed from instant messaging and e-mail. More than 62 percent of respondents either strongly agreed or agreed that instant messages convey more than just text. E-mail is also believed to convey more than just text, with more than 50 percent strongly agreeing or agreeing that it conveys other information cues.

Finally, question 7 states that it is easier to convey emotions using instant messaging rather than e-mail. More than 75 percent of respondents were in agreement.

Relationships

Another group of questions deals with how useful instant messaging and e-mail are in building relationships. While both technologies are believed to be useful in work and social relationships, there is again a preference for instant messaging.

Questions 13 and 16 look at how the technologies can aid the growth of friendships. More than 50 percent agreed that instant messaging allows friendships to grow more quickly. Just over 25 percent felt the same way about the use of e-mail.

Questions 14 and 15 looked at how the two technologies can improve the relationships of friends and/or team members. Of the 60 percent than agreed that instant messaging allows people to feel closer to their friends and teammates, nearly 20 percent strongly agreed. Comparatively, only 7 percent strongly agreed that e-mail brings them closer to friends and team members, while fewer than 50 percent agreed.

A number of individual questions also provide insight into the preference of instant messaging when building relationships. Nearly, 20 percent strongly agreed, and more
<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Instant messaging or e-mail</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>When I use instant messaging to communicate, I use a great deal of symbols to represent my feelings or emotions</td>
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<tr>
<td>2</td>
<td>My friends who send me instant messages often use symbols to represent their feelings or emotions</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Instant messaging conveys more than just text, other information cues are also conveyed</td>
<td></td>
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<tr>
<td>4</td>
<td>When I use e-mail, I use a great deal of symbols to represent feelings and emotions</td>
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<tr>
<td>5</td>
<td>My friends who send me e-mail often use symbols to represent their feelings or emotions</td>
<td></td>
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<tr>
<td>6</td>
<td>E-mail conveys more than just text information; other information cues are also conveyed</td>
<td></td>
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<tr>
<td>7</td>
<td>It is easier to convey emotions using instant messaging than e-mail</td>
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<tr>
<td>8</td>
<td>My friends and I often have a good time when we use instant messaging to communicate</td>
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<td>9</td>
<td>I enjoy the process of using instant messaging</td>
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<tr>
<td>10</td>
<td>My friends and I often have a good time when we use e-mail to communicate</td>
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<tr>
<td>11</td>
<td>I enjoy the process of using e-mail</td>
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<tr>
<td>12</td>
<td>I enjoy the instant messaging more than e-mail</td>
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<tr>
<td>13</td>
<td>Instant messaging allows friendships to develop more quickly</td>
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<td>14</td>
<td>Instant messaging makes me feel closer to my friends or team members</td>
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<td>15</td>
<td>E-mail makes me feel closer to my friends or team members</td>
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<tr>
<td>16</td>
<td>E-mail allows friendships to develop more quickly</td>
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<td>17</td>
<td>Instant messaging is more personal than e-mail</td>
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<td>18</td>
<td>Instant messaging is better than e-mail for social interaction</td>
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<td>19</td>
<td>Instant messaging allows me to communicate more information than e-mail</td>
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<td>20</td>
<td>I feel that instant messaging conveys a large amount of information faster</td>
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<td>21</td>
<td>It is easy to use instant messaging</td>
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<td>22</td>
<td>It is easy to use e-mail</td>
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<td>23</td>
<td>Instant messaging is easier to use than e-mail</td>
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<td>24</td>
<td>E-mail is more accessible than instant messaging</td>
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<td>25</td>
<td>It only takes a short time to learn how to use instant messaging</td>
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<tr>
<td>26</td>
<td>It only takes a short time to learn how to use e-mail</td>
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<td>Instant messaging is better than e-mail for clarifying ambiguous (hard to understand) issues</td>
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<td>Instant messaging is better than e-mail for explaining confusing matters</td>
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<td>29</td>
<td>Instant messaging is better than e-mail for resolving disagreements</td>
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<td>30</td>
<td>Instant messaging can be as effective as face-to-face meetings</td>
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<tr>
<td>31</td>
<td>E-mail can be as effective as face-to-face meetings</td>
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<td>32</td>
<td>Instant messaging is a useful tool for work</td>
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<td>33</td>
<td>Instant messaging is useful for social networking</td>
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<td>Instant messaging is more useful than e-mail for interacting with friends</td>
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<td>Instant messaging is more useful than e-mail for interacting with co-workers (or fellow students working in a team on assignments)</td>
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<td>36</td>
<td>I use e-mail frequently</td>
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<td>37</td>
<td>I use e-mail almost everyday</td>
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<tr>
<td>38</td>
<td>I use instant messaging frequently</td>
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<tr>
<td>39</td>
<td>I use instant messaging almost everyday</td>
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<td>40</td>
<td>I can use instant messaging anywhere (home, residence hall, classroom, lab, library, etc.)</td>
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<tr>
<td>41</td>
<td>I can use e-mail anywhere (home, residence hall, classroom, lab, library, etc.)</td>
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<td>Instant messaging is very reliable</td>
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<td>43</td>
<td>E-mail is very reliable</td>
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<tr>
<td>44</td>
<td>Instant messaging is very secure</td>
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<td>45</td>
<td>I do not worry about security when I use instant messaging</td>
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<td>46</td>
<td>E-mail is very secure</td>
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<tr>
<td>47</td>
<td>I do not worry about security when I use e-mail</td>
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</table>

Table I. Survey questions (continued)
than 65 percent agreed, that instant messaging is more personal than e-mail (question 17). Question 18 states that instant messaging is better than e-mail for social interaction. About 80 percent agreed with that statement, with more than 25 percent in strong agreement. Nearly, 50 percent agreed that instant messaging is able to communicate more information than e-mail (question 19). Likewise, only 3 percent were in strong disagreement. More than 75 percent of respondents agreed, with question 33, that instant messaging is useful for social networking (Figure 6).

**Table I.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>I believe my privacy is protected with instant messaging</td>
</tr>
<tr>
<td>49</td>
<td>I do not worry about my privacy when I use instant messaging</td>
</tr>
<tr>
<td>50</td>
<td>I believe my privacy is protected with e-mail</td>
</tr>
<tr>
<td>51</td>
<td>I do not worry about my privacy when I use e-mail</td>
</tr>
<tr>
<td>52</td>
<td>In the future, I will use instant messaging more than e-mail</td>
</tr>
<tr>
<td>53</td>
<td>In the future, I will use e-mail more than instant messaging</td>
</tr>
<tr>
<td>54</td>
<td>Have you ever used wireless instant messaging?</td>
</tr>
<tr>
<td>55</td>
<td>Have you ever used wireless e-mail?</td>
</tr>
<tr>
<td>56</td>
<td>I use e-mail mainly for??</td>
</tr>
<tr>
<td>57</td>
<td>I use instant messaging for??</td>
</tr>
<tr>
<td>58</td>
<td>For social interactions, I prefer to use??</td>
</tr>
<tr>
<td>59</td>
<td>For work or coursework related interactions, I prefer to use??</td>
</tr>
</tbody>
</table>

**Figure 5.**
Percentage in agreement that friends use symbols to convey emotion when using instant messaging and e-mail

**Figure 6.**
Instant messaging is better than e-mail for social interaction
A most interesting pair of questions, 34 and 35, look at the preference of instant messaging or e-mail when interacting with friends and coworkers. More than 75 percent were in agreement that instant messaging is more useful than e-mail when interacting with friends. However, when asked the same question about coworkers, only 44 percent were in agreement. Also, nearly 32 percent were neutral, while 24 percent were in disagreement.

Usage
A number of questions were organized around the EU of instant messaging and e-mail. Both communication methods are considered easy to use and learn. Also included in the usage section is the preferred usage of instant messaging and e-mail for work or social interaction. A striking preference was found. Instant messaging is strongly favored for personal use while e-mail is the preferred method for work. Finally, despite the support for both instant messaging and e-mail, face-to-face communication is still regarded as much more effective.

Questions 21 and 22 compare the EU of instant messaging and e-mail. In both cases, more than 90 percent found the technologies to be easy to use and learn. Questions 25 and 26 found similar results with more than 90 percent agreeing that instant messaging and e-mail take only a short time to learn. One discrepancy can be found in question 23. More than 40 percent of respondents agreed or strongly agreed that instant messaging is easier to use than e-mail.

Questions 56 through 59 sought the preferred use of the two technologies. There is a distinct preference for the use of instant messaging for personal and social interaction. More than 60 percent use instant messaging for those reasons, while less than 1 percent use instant messaging for work related activities. Also, nearly 80 percent preferred using e-mail for work, while nearly 75 percent preferred using instant messaging for social interaction (Figure 7).

Finally, question 30 compares the effectiveness of instant messaging with face-to-face meetings. More than 63 percent disagreed that instant messaging is as effective with face-to-face meetings. Question 31 was even more striking with nearly 75 percent in disagreement with the belief that e-mail can be as effective as face-to-face meetings.
Reliability
A final group of questions centered on the reliability, security and privacy of instant messaging and e-mail. In all areas, users perceive e-mail more favorably.

Questions 42 and 43 looked at the perceived reliability of the two technologies. More than 16 percent strongly agreed, and more than 48 percent agreed, that instant messaging is very reliable. Yet, more than 28 percent strongly agreed, with more than 52 percent in agreement, that e-mail is very reliable.

Questions 44 through 47 gauged the believed security of instant messaging and e-mail. While just over 30 percent of respondents agreed that instant messaging is very secure, more than 50 percent agreed that e-mail is very secure. However, the gap is much narrower, and nearly indistinguishable, with the statement that users did not worry about their security when using the technologies. More than 13 percent strongly agreed with the statement when using instant messaging, compared to the more than 15 percent when using e-mail.

Questions 48 through 51 looked at the privacy beliefs when using instant messaging and e-mail. Again, a slight preference for e-mail can be found. Nearly, 50 percent agreed that their privacy is protected with e-mail, compared to just under 35 percent with instant messaging. Also, more than 60 percent agreed that they did not worry about their privacy when using e-mail. About 53 percent were in agreement when the communication method was changed to instant messaging (Figure 8).

Limitations
The limitations of this study stem from the use of college students as the subjects of the survey. As such any work related conclusions can only be applied to their experience of working on homework and small group assignments. Also, because the subjects of this study were all in a similar age range (18-22), the conclusions should not be applied to the entire population. Additional studies should be conducted looking at the differences between instant messaging and e-mail in business environments as well as including other age groups.

Conclusion
E-mail and instant messaging are popular communication methods for college students. This study looks at the perceived differences college students have between the two technologies. The results show that instant messaging is perceived as offering many advantages over e-mail including conveying emotions, building relationships...
and EU. Users are more likely to use symbols with their instant messages to help communicate. College students find both technologies to be easy to use, but show a preference for the EU of instant messaging. However, despite its perceived functional benefits, instant messaging is only the favored form of communication for personal and social relationships. E-mail is still preferred for work related communication, while both technologies are still less desirable than face-to-face communication.

References


**Further reading**


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