Journal of Business Ethics (2008) 83:657–671
DOI 10.1007/s10551-007-9646-3

Ethics vs. IT Ethics: Do Undergraduate Students Perceive a Difference?

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ABSTRACT. Do undergraduate students perceive that it is more acceptable to 'cheat' using information technology (IT) than it is to cheat without the use of IT? Do business discipline-related majors cheat more than non-business discipline-related majors? Do undergraduate students perceive it to be more acceptable for them personally to cheat than for others to cheat? Questionnaires were administered to undergraduate students at five geographical academic locations in the spring, 2006 and fall 2006 and spring, 2007. A total of 708 usable questionnaires were returned including 532 from students majoring in business-related disciplines and 139 from students majoring in non-business related disciplines (37 were undecided). It appears that in terms of intellectual property violations, undergraduate students in general find cheating using IT more acceptable than cheating without the use of IT. It also appears that undergraduate students perceive that it is relatively more acceptable for them to personally cheat when using IT than for others to cheat when using IT, although this is reversed when IT is not involved. No significant differences on these issues were found between undergraduate students having business discipline-related majors and those having non-business discipline-related majors.

KEY WORDS: business ethics, cheating, ethical decision-making, information technology, intellectual property violations, internet cheating, Internet ethics, IT ethics, plagiarism, student ethical perceptions

Introduction

In the 2006 Josephson Institute's report card on American youth survey of 36,000 high school students, 60% admitted to cheating on a test during the past year and 33% said they used the Internet to plagiarize an assignment (Josephson, 2006). Despite these high levels of dishonesty, 92% said they were satisfied with their personal ethics and character and 74% said that when it comes to what is right, they are better than most people they know (Center for Academic Integrity, 2006). According to Josephson, the 2006 results were almost identical to those reported in 2004.

Many studies examine students' attitudes toward cheating, but fewer focus on cheating using information technology (IT). With respect to cheating regarding business students, for example, Gulli et al. (2007) reported that a survey of graduate students published in 2006 by the Academy of Management Learning and Education found that business students were the worst cheaters, followed closely by engineering students. McCabe and Trevino (1993) found that business students cheat more often than non-business students, and Crown and Spiller (1998) suggest that business students tolerate unethical behaviors more often than do non-business students. In contrast, Iyer and Eastman (2006) found that non-business students would engage in higher levels of academic dishonesty than will business majors.

With respect to cheating using IT, Muir (2006) reported on a survey of Canadian students, who thought that stealing software from a store is a serious offense; but only 40% of these thought that illegally downloading software from the Internet is stealing. Taylor (2004) found in a recent study that 65% of undergraduate business majors as compared with 56% of non-business majors indicated that it is not ethical to download software or music from the Internet without paying or complying with license agreements. According to McCabe (2005), while 10% of students admitted to cut-and-paste plagiarism from the Internet in 1999, almost 40% admit to doing so in 2005, and a majority of students (77%) believe such cheating is not a very serious issue.

Wood (2004) states that because students have grown up in the world of the Internet with its easy access to information, they simply don't consider cut-and-paste Internet copying as plagiarism.

There appears to be an ongoing disconnect between student's ideas of what is ethical in terms of their personal ethics or character and their actions in terms of intellectual property violations. Could the integration of IT into academia be causing this disconnect? That is, do undergraduate students perceive that it is more acceptable to cheat using IT than cheating without the use of IT? Given that today's undergraduate students are the employees of tomorrow and if the ethics they have as undergraduates shape their behaviors in the future, then we need to understand and address this gap in students' ethical behaviors before they enter the working arena. For instance, one survey reported that 78% of organizations have disciplined employees for dishonest use of the Internet (Messmer, 2002).

Objectives

Although the literature contains a variety of research on ethics and IT, there has been a lack of empirical research on studying student perceptions' of ethical issues in using IT. Lawson (2004) indicates, for example, that students who cheat in an academic setting are more likely to support unethical behaviors in a business setting than are those who do not cheat as students. Research on student IT ethics is needed because by working to affect positive IT ethics in students, it may be possible to positively influence the direction of their IT ethics in the organizations where they work after graduation.

This article looks at students' perceptions of cheating using IT. In order to evaluate our students' perceptions of cheating, we first describe what we define as cheating. Molnar et al. (2005) defined cheating as a ''violation of intellectual property; including plagiarism of any kind.'' We begin by looking at previous research on student cheating, IT ethical theory and how IT-related ethical issues might affect decision making. We then propose a conceptual framework to empirically study this issue, outline the methodology for our research, present and examine the results, offer conclusions and implications and suggest areas for future research.

Background and literature review

Previous research on student cheating

Ethical or unethical behavior takes place as a result of an ethical dilemma (Bommer et. al., 1987). How we resolve these ethical dilemmas is linked to a myriad of factors. Operationally, we need to understand the major factors involved in ethical decision making in order to understand ethical/unethical behaviors. Predisposition to engage in ethical or unethical behavior is a complex issue. Previous studies of academic dishonesty among college students have focused on two major areas: studies of individual factors and studies of situational factors (Crown and Spiller, 1998; Whitley, 1998). The majority of this research has focused on the individual factors including gender (Nowell and Laufer, 1997; Whitley, 1998; Crown and Spiller, 1998; Ward and Beck, 1989), grade point average (Leming, 1980; Tittle and Rowe, 1973), age (Turiel et al., 1987), moral development (Kohlberg, 1969, 1971, 1976, 1980, 1984, 1985), undergraduate/graduate status (Roig and Ballew, 1994; Nowell and Laufer, 1997), and academic major (McCabe and Trevino, 1995) to name just a few. However, large multi-institutional studies have indicated that situational factors play a critical role in ethical behaviors (McCabe and Trevino, 1993, 1997). Buckley et al. (1998) found that one of the most effective predictors of student cheating was the probability of being caught and penalized. Becker (1968) suggests that cheating occurs because the benefits of cheating outweigh the costs. The problem is the majority of research on student cheating was undertaken before the advent of the Internet and IT. IT has dramatically changed the situational factors by lowering the barriers to cheating through increasing the opportunities to cheat, decreasing the observability of cheating, decreasing the chances of being caught and reducing the risk of punishment, thereby increasing the benefits of cheating while outweighing the costs. Thus the factors that led to student cheating before IT came into widespread use no longer impact students' decisions to cheat in the same way as they did before.

IT ethical theory

We begin looking at IT ethical theory by starting with Azjen's theory of planned behavior (1991). The theory of planned behavior (TPB) proposes that individual intention to perform behaviors can be predicted by attitude toward the behavior, subjective norms, and perceived behavioral control. The TPB has been successfully applied to ethical situations involving academic dishonesty (Beck and Azjen, 1991) and IT ethics (Kreie and Cronan, 2000; Leonard and Cronan, 2002; Haines and Leonard, 2004). In 1998, Banerjee et al., proposed an expansion of this model to specifically deal with problems involving ethical issues or ethical behavior which incorporates variables from models in moral development research. This research showed that "...the most important variable in explaining ethical behavior intention was the organization-scenario variable... In addition, an individual's personal normative beliefs and organizational ethical climate were statistically significant variables (p. 42)." In other words, an individual's intention to behave ethically/unethically is strongly related to the individual's perceived organizational environment (i.e., ethics are situationally specific) and influenced by the person's normative beliefs. Normative beliefs refer to the moral obligation to perform an act (Schwartz and Tessler, 1972). Kreie and Cronan (2000) found that people rely heavily on their personal values when deciding what is ethical or unethical behavior. However, when the ethical issue in a given situation is not considered of great importance, people are more likely to consider what company standards say to do or not to do. Payne and Nantz (1994) saw that students perceived a difference between cheating on exams (seen as blatant cheating) and other forms as cheating, such as plagiarism (seen as not really cheating). Scanlon (2003) suggests that widespread use of the Internet may be changing students' conception of 'fair use' leading them to believe all information in cyberspace is public knowledge and therefore cutting and pasting from public knowledge is not considered plagiarism. In the University of Guelph news release (2006) regarding research on academic misconduct problems in Canada, one of the researchers of the study, Christensen-Hughes, states

> Many students have a different view of what constitutes academic misconduct, particularly when it comes to working with others or in situations they perceive to be unfair. Students may engage in these behaviours simply because they don't believe they're wrong. These results may be indicative of a clash between a collaborative student culture and a more traditional, individualistic faculty culture. The problem could also stem from the fact that only 14 per cent of the students thought they would get caught for cheating in high school and even fewer indicated they would be embarrassed to tell their friends they had done so.

How IT may affect ethical decision making

Ethical standards are still evolving for IT creating a problematic situation. In the IT literature there appears to be a chasm of thought on whether or not IT ethics is essentially different from 'regular' ethics and whether research conclusions regarding more traditional ethical issues apply to IT behavioral intentions (Moor, 1985; Tavani, 2002). Computers have changed forever the way we conduct business and live our lives. Each year of the information age means more and faster processing by smaller and more powerful computers, and easier and more geographically dispersed opportunities to connect to Internet resources. The increased capabilities of computers, along with easy and widely available Internet access, present new ethical challenges. Parker et al. (1990) offer several reasons why ethical problems involving IT pose a special challenge.

- Using computers and data communications alters the relationship among people. There are no longer face-to-face interactions.
- Information in electronic form is far more 'fragile' than when it is on paper. The questions of property rights, plagiarism, piracy and privacy become active issues.
- Efforts to protect information integrity, confidentiality and availability often conflict with the benefits of information sharing.
- The lack of widespread means of authorization and authentication exposes IT to unethical practice.

Phukan (2005) suggests that the reason people are willing to commit intellectual property violations on

the Internet when they would not otherwise, is because they do not perceive there is a real victim.

Kallman and Grillo (1993) state that there are two concepts that have a major effect on how humans perceive computers and, therefore, how humans perceive ethical situations involving computers, the order-of-magnitude effect and the effort effect. The order-of-magnitude effect is based on the fact that, for each tenfold increase in speed (one order of magnitude), our perception of what is going on changes dramatically. Computers operate at a speed that is several orders of magnitude faster than human activity and this increase in power has occurred over a number of years. As a consequence of rapid IT growth, we are forced to adapt on a continuing basis. There is pressure to keep up with the competitive edge. We can barely manage to learn the new technologies before they change and as a result, we often pay little attention to the consequences of their use. Due to the order-of-magnitude effect, harmless situations may turn into harmful ones without our realizing it.

The second concept, the effort effect, maintains that, if a task is not worth the effort, people will tend to not undertake it. For example, in an academic setting, retyping an entire paper manually may not be considered worth the effort. However, using the Internet and 'cut and paste' technology, an entire paper or parts of it can be downloaded into a word processor in a matter of seconds. The elimination of effort required to access and collate large quantities of data poses its own threat. If IT and the order-of-magnitude and effort effects dramatically change the situational factors by lowering the barriers to cheating, we should notice a significant difference in student perceptions of cheating with IT and cheating without IT.

Use of IT/ Perception category	IT	Non-IT
Myself and Others	10 Survey Questions (1,2,7,8,9,10,17,18,19,22)	10 Survey Questions (3,4,5,11,13,14,15,16,20,21)
Myself	5 Survey Questions (Nos: 1,2,7,18,22)	5 Survey Questions (Nos: 4,5,16,20,21)
Others	5 Survey Questions (Nos: 8, 9,10,17, 19)	5 Survey Questions (Nos: 3, 11,13,14,15)

Figure 1. IT versus non-IT perceptions of intellectual property violations (displays the corresponding survey question numbers per category).

Conceptual framework

In order to study IT's effect on perceptions of cheating, we outline our conceptual model of IT versus non-IT intellectual property violations. The conceptual model serves as a framework to guide our analysis. The framework depicts the two major elements that are involved in the proposed model, IT or non-IT intellectual property violations (Figure 1). In addition, we divided cheating into two categories: (1) the student perceives cheating to be acceptable for them and (2) the student perceives cheating to be acceptable for others. Within each of the four intersecting cells are the expected outcomes that, if IT is involved, will affect students' responses; that is, IT may be altering our perceptions of intellectual property violations. Using this framework, we conducted a simple survey to initially test our conceptual model.

Hypotheses

Although there is widespread overall agreement on ethical issues, there may be ambiguity when it comes to their applications. For example, most students would agree that it is wrong to shoplift. However, many disagree about whether or not is it okay to download music from the Internet. In addition, student conceptions of 'fair use' may lead them to view information in cyberspace as public knowledge.

Based on the conceptual model, the following hypotheses are presented:

H1: In general, students will find it more acceptable to cheat when using IT than when not using IT.
H2: Students will find it more acceptable for them personally to cheat when using IT than when not using IT.
H3: Students will find it more acceptable for others to cheat when using IT than when not using IT.

The disagreement in the literature about business student ethics as compared with non-business student ethics motivated us to formulate similar hypotheses for studying IT ethics and traditional ethics across these two groups. Based on these considerations, the following hypotheses are presented:

H1a: Students majoring in business-related disciplines will find it more acceptable to cheat when using IT than will students majoring in humanities- and science-related disciplines.

H2a: Students majoring in business-related disciplines will find it more acceptable for them personally to cheat when using IT than will students majoring in humanities- and science-related disciplines.

H3a: Students majoring in business-related disciplines will find it more acceptable for others to cheat when using IT than will students majoring in humanities- and science-related disciplines.

Finally, we wanted to examine whether undergraduate students perceive it is more acceptable for them personally to cheat than for others to cheat. We again examined our conceptual model with respect to this classification and proposed the following hypotheses:

H4: In general, students will find it more acceptable for them personally to cheat than for others to cheat.

H5: Students will find it more acceptable for them personally to cheat when using IT than for others to cheat when using IT.

H6: Students will find it more acceptable for them personally to cheat when not using IT than for others to cheat when not using IT.

Methodology

The survey

The TPB model and Banerjee et al. (1998) expansion of this model suggests that ethical behavior intention is a predecessor to ethical/unethical behavior. Therefore, the intention to behave ethically/unethically, instead of the actual behavior, is measured. Questionnaire development consisted of multiple phases. Our questionnaire uses items similar to those used by Calluzzo and Cante (2004), Etter et al. (2006) and Iyer and Eastman (2006) which identified specific cheating behavior rather than general questions as suggested by Nonis and Swift (1998). We conducted a pre-test of the questionnaire with 16 undergraduate students in order to collect explicit feedback on the ease of understanding the questions, any questions or comments they had and how long they took to complete the survey (Molnar and Kletke, 2002). The original questionnaire directly asked the student if they had cheated such as ''I have downloaded from the Internet a term paper, or other material, and submitted it to a class as my own work for a grade.'' Based on the responses received during the preliminary testing process and guided by the Allen et al. (1998) suggestion that direct, self-reported measures of cheating may underestimate its frequency, the questionnaire was revised and the questions were restated in a more benign way such as ''It is okay for me to ...''. A pilot study using this revised questionnaire was then performed with 344 undergraduate students (Molnar et al., 2005). Two additional questions were added to the final questionnaire (questions 5 and 11) along with additional questions on demographics, whether or not the students had taken any ethics courses and amount of time spent on the computer on a weekly basis.

Surveys were then administered to undergraduate students at five different geographical academic locations in the fall and spring semester, 2006–2007. All subjects volunteered to take the survey and extra credit for completing it was not provided. All subjects were guaranteed complete anonymity; no personal identifying data of any sort was collected. The subjects were reminded to read the questions closely (due to the reversal of the way some questions were asked) and were given adequate time to complete the surveys. Data were coded on an interval assumed Likert-scale of 1–5, with 1 representing 'strongly disagree' with the acceptance of cheating and 5 indicating 'strongly agree' with the acceptance of cheating, as perceived by the subject. Appropriate reversals of negative question responses were made. The survey asked how the students felt about cheating using IT (e.g., ''It is okay for me to copy text or images from the Internet (without citing it in my work) and submit it to a class as my own work for a grade'') versus not using IT (e.g., ''It is okay for me to copy material from a book, periodical or newspaper (without citing it in my work) and submit it to a class as my own work for a grade.'') for themselves and for others (e.g., ''It is okay for others to ...''). The questions were divided into various categories of intellectual property violations which included, copying/shoplifting of

music/software/computer games, copying electronically or non-electronically completely or any part of a homework assignment, copying electronically or non-electronically completely or any part of a paper, buying or borrowing a paper, and illegally getting test answers electronically or non-electronically. Each of the categories was represented by five questions (identified in Figure 1). The questionnaire is in the Appendix.

A principal factor analysis was performed on the 20-item Likert questions (questions 6 and 12 were removed due to the ambiguity of the questions), and a four factor solution was found. Reliability for each measure was evaluated using Cronbach's (1951) coefficient alpha. Coefficient alpha levels for each item in the measure exceeded the minimum acceptable level of 0.70 suggested by Nunnally (1978). (Cronbach's alpha for factors 1–4 were .771, .761, .726, .761, respectively). The four-factor solution was obtained using eigenvalue greater than one criterion with a varimax rotation. Factor 1 consisted of questions 1, 2, 7, 18, and 22 with factor loadings ranging from .555 to .788, which we labeled IT/myself. These questions state ''It is okay for me...:'' and use information technology such as a spreadsheet or the Internet in the question. Factor 2 consisted of questions 4, 5, 16, 20, and 21 with factor loadings ranging from .501 to .846 which we labeled non-IT/myself. These questions state ''It is okay for me...:'' and suggest manual copying of work instead of using IT. Factor 3 consisted of questions 8, 9, 10, 17, and 19 with factor loadings ranging from .587 to .801 which we labeled IT/others. These questions state ''It is okay for someone other than myself...:'' and use information technology such as a spreadsheet or the Internet in the question. Factor 4 consisted of questions 3, 11, 13, 14, and 15 with factor loadings ranging from .553 to .857 which we labeled non-IT/others. These questions state ''It is okay for someone other than myself...:'' and suggest manual copying of work instead of using IT.

Results

A total of 708 usable questionnaires were returned: 104 questionnaires from a small, private liberal arts college in the north mid-west, 412 questionnaires from a large, public south mid-western university, 95 questionnaires from a large, public north-western university, 43 questionnaires from a small, private catholic north eastern college, and 54 questionnaires from a small, private north eastern college. Of the students completing the questionnaire, 532 declared themselves in a business related discipline, 139 in a non-business related discipline, and 37 were either undecided for a major or did not declare a major. Each cell in the model had 708 responses for every question.

A paired *t*-statistic analysis was performed on the responses to the questionnaire comparing the difference in means of two dependent variables of IT and non-IT, versus the variables of user attitudes. The paired *t*-statistic is appropriate because all respondents answered both the questions about the use of IT and the questions about the non-use of IT. Recall that the larger the number of the response, the more strongly the student agrees that it is okay to cheat. Table I summarizes the results of hypotheses 1–3 that are discussed below.

The first hypothesis H1: Students will find it more acceptable to cheat when using IT than when not using IT.

All responses for cheating using IT (a total of 10 questions) were compared to all responses for cheating without the use of IT (a total of 10 questions). (Note: Since we combined factors 1 and 3 into one pooled factor (using IT overall) and factors 2 and 4 into another pooled factor (not using IT overall) for the analysis of this question, we performed a reliability analysis on these two pooled factors and found the resulting Chronbach alphas to be .852 and .847, respectively). Since all respondents answered questions about both IT and non-IT, the paired *t*-statistic analysis was used to evaluate data. The individual difference $(D) = \mu_{(\text{of all responses for cheating using IT})} - \mu_{(\text{of all responses for cheating without the use of IT})}$ were used for the analysis. The hypotheses for this paired *t*-statistic were

H_0: $\delta_0 = 0$: (there were no differences between $\mu_{(\text{IT})}$ and $\mu_{(\text{non-IT})}$)
H_1: $\delta_0 \neq 0$

Note δ_0 was the mean of the population differences. The mean of the population differences between IT

TABLE I

The conceptual model and results of the paired *t*-statistic test for hypotheses 1–3

Use of IT/perception category	IT	Non-IT	*N*	Mean diff.	Std. deviation	*t*	*p*-value
H1: Overall (myself, others)	Question no. (1, 2, 7, 8, 9, 10, 17, 18, 19, 22)	Question no. (3, 4, 5, 11, 13, 14, 15, 16, 20, 21)	708	0.104	0.384	7.213	0.000
H2: Myself	Question no. (1, 2, 7, 18, 22)	Question no. (4, 5, 16, 20, 21)	708	0.197	0.447	11.732	0.000
H3: Others	Question no. (8, 9, 10, 17, 19)	Question no. (3, 11, 13, 14, 15)	708	0.011	0.473	0.604	0.546

(mean = 2.06, std. dev. = 0.615) and non-IT (mean = 1.96, std. dev. = 0.618) based questions was 0.104 with a standard deviation of 0.384, and the computed test statistic (*t*) had a value of 7.213. The null hypothesis was rejected at a *p*-value of <.05, which means that there was a difference between $\mu_{(IT)}$ and $\mu_{(non\text{-}IT)}$. The paired *t*-statistic analysis with the mean of the populations differences (0.104) supports the hypothesis that *students find it more acceptable to cheat when using IT than when not using IT*.

This hypothesis was also tested for business discipline-related majors as compared with non-business discipline-related majors (Hypothesis H1a). The computed *t*-statistic was −0.076 with a *p*-value of 0.93; the null hypothesis could not be rejected at a *p*-value of <.05. Thus, for the data of this study, there were no demonstrable differences that would support hypothesis H1a and, therefore, there does not appear to be a difference in terms of perceptions of cheating when using and not using IT between business discipline-related majors and non-business discipline-related majors.

The second hypothesis H2: Students will find it more acceptable for them personally to cheat when using IT than when not using IT.

All responses for cheating using IT for the students personally (a total of 5 questions) were compared to all responses for cheating without the use of IT for the student personally (a total of 5 questions). Again, because all respondents responded to both the IT and non-IT related questions, the paired *t*-statistic analysis was used to evaluate data. The individual differences (D) = $\mu_{(\text{of all responses for cheating using IT for the students personally})} - \mu_{(\text{of all responses for cheating without the use of IT for the students personally})}$ were used for the analysis. The hypotheses for this paired *t*-statistic were

H_0: $\delta_0 = 0$: (there were no differences between $\mu_{(IT,\ personally)}$ and $\mu_{(non\text{-}IT,\ personally)}$)
H_1: $\delta_0 \neq 0$

Note δ_0 was the mean of the population differences. The mean of the population differences between IT (mean = 2.10, std. dev. = .627) and non-IT (mean = 1.90, std. dev. = 0.636) for students

personally based questions was 0.197, the standard deviation was 0.447, and the computed test statistic (t) had a value of 11.732. The null hypothesis was rejected at $p < .05$, which meant that there were differences between $\mu_{(\text{IT, personally})}$ and $\mu_{(\text{non-IT, personally})}$. The paired t-statistic analysis with the mean of the populations difference (0.197) supports the hypothesis that *students will find it more acceptable for them personally to cheat when using IT than when not using IT*.

This hypothesis was also tested for business discipline-related majors as compared with non-business discipline-related majors (Hypothesis H2a). The computed t-statistic was 0.018 with a p-value of 0.99; the null hypothesis could not be rejected at $p < .05$. Thus, for the data of this study, there were no demonstrable differences that would support hypothesis H2a and therefore there does not appear to be a difference in terms of perceptions of cheating for students personally when using and not using IT between business discipline-related majors and non-business discipline-related majors.

The third hypothesis H3: Students will find it more acceptable for others to cheat when using IT than when not using IT.

All responses for others cheating using IT (a total of 5 questions) were compared to all responses for others cheating without the use of IT (a total of 5 questions). As before, the paired t-statistic analysis was used to evaluate data. The individual differences $(D) = \mu_{(\text{of all responses for cheating using IT for other students})} - \mu_{(\text{of all responses for cheating without the use of IT for other students})}$ were used for the analysis. The hypotheses for this paired t-statistic were

H_0: $\delta_0 = 0$: (there were no differences between $\mu_{(\text{IT, others})}$ and $\mu_{(\text{non-IT, others})}$)
H_1: $\delta_0 \neq 0$

Note δ_0 was the mean of the population differences. The mean of the population differences between IT (mean = 2.03, std. dev. = 0.666) and non-IT (mean = 2.02, std. dev. = 0.668) for others-based questions was 0.011 with a standard deviation of 0.473. The computed test statistic (t) had a value of 0.604, so the null hypothesis could not be rejected at $p < .05$, which meant that there were no differences between $\mu_{(\text{IT, others})}$ and $\mu_{(\text{non-IT, others})}$). The paired t-statistic analysis with the mean of the populations differences (0.011) does not support the hypothesis that *students will find it more acceptable for others to cheat when using IT than when not using IT*.

This hypothesis was also tested for business discipline-related majors as compared with non-business discipline-related majors (Hypothesis H3a). The computed t-statistic was −0.158 with a p-value of 0.87; the null hypothesis could not be rejected at a p-value <0.05. Thus, for the data of this study, there were no demonstrable differences that would support hypothesis H3a and therefore there does not appear to be a difference in terms of perceptions of others cheating when using and not using IT between business discipline-related majors and non-business discipline-related majors. For this study overall, no significant differences could be determined with respect to student perceptions regarding cheating using IT for business discipline-related majors as compared with non-business discipline-related majors.

A paired t-statistic analysis was also performed on the responses to the questionnaire comparing the difference in means of two dependent variables of others, and myself versus the variables of user attitudes. Table II summarizes the results of hypotheses 4–6 that are discussed below.

The fourth hypothesis H4: In general, students will find it more acceptable for them personally to cheat than for others to cheat.

All responses for cheating myself (a total of 10 questions) were compared to all responses for cheating for others (a total of 10 questions). (Note: Since we combined factors 1 and 2 into one pooled factor (myself overall) and factors 3 and 4 (others overall) into another pooled factor for the analysis of this question, we performed a reliability analysis on these two pooled factors and found the resulting Chronbach alphas to be .831 and .851, respectively). Since all respondents answered questions about cheating for themselves and for others, the paired t-statistic analysis was used to evaluate data. The individual difference $(D) = \mu_{(\text{of all responses for cheating for me personally})} - \mu_{(\text{of all responses for cheating for others})}$ were used for the analysis. The hypotheses for this paired t-statistic were

TABLE II

The conceptual model and results of the paired *t*-statistic test for hypotheses 4–6

Use of IT/perception category	Myself	Others	*N*	Mean diff.	Std. deviation	*t*	*p*-value
H4: Overall (IT/non-IT)	Question No. (1, 2, 4, 5, 7, 16, 18, 20, 21, 22)	Question No. (3, 8, 9, 10, 11, 13, 14, 15, 17, 19)	708	−0.022	0.323	−1.781	0.075
H5: IT	Question No. (1, 2, 7, 18, 22)	Question No. (8, 9, 10, 17, 19)	708	0.072	0.402	4.759	0.000
H6: Non-IT	Question No. (4, 5, 16, 20, 21)	Question No. (3, 11, 13, 14, 15)	708	−0.115	0.420	−7.275	0.000

H_0: $\delta_0 = 0$: (there were no differences between $\mu_{(\text{myself})}$ and $\mu_{(\text{others})}$)
H_1: $\delta_0 \neq 0$

Note δ_0 was the mean of the population differences. The mean of the population differences between myself (mean = 2.00, std. dev. = .0.591) and others (mean = 2.02, std. dev. = 0.623) based questions was −0.022 with a standard deviation of 0.323. The computed test statistic (*t*) had a value of −1.781, so the null hypothesis could not be rejected at a *p*-value <.05, which meant that there was no significant difference between $\mu_{(\text{myself})}$ and $\mu_{(\text{others})}$. The paired *t*-statistic analysis with the mean of the population differences (−0.022) does not support the hypothesis that students in general find it more acceptable for them personally to cheat than for others to cheat.

The fifth hypothesis H5: Students will find it more acceptable for them personally to cheat when using IT than for others to cheat when using IT.

All responses for cheating using IT for the students personally (a total of 5 questions) were compared to all responses for cheating with the use of IT for others (a total of 5 questions). Again, because all respondents responded to questions regarding cheating with the use of IT both for themselves and for others, the paired *t*-statistic analysis was used to evaluate data. The individual differences $(D) = \mu_{(\text{of all responses for cheating using IT for me personally})} - \mu_{(\text{of all responses for cheating using IT for others})}$ were used for the analysis. The hypotheses for this paired *t*-statistic were

H_0: $\delta_0 = 0$: (there were no differences between $\mu_{(\text{IT, personally})}$ and $\mu_{(\text{IT, others})}$)
H_1: $\delta_0 \neq 0$

Note δ_0 was the mean of the population differences. The mean of the population differences between myself (mean = 2.10, std. dev. = 0.627) and others (mean = 2.03, std. dev. = 0.666) using IT-based questions was 0.072 with a standard deviation of 0.402. The computed test statistic (*t*) had a value of 4.759, so the null hypothesis was rejected at $p < .05$, which meant that there were differences between $\mu_{(\text{IT, personally})}$ and $\mu_{(\text{IT, others})}$. The paired *t*-statistic analysis with the mean of the population differences

(0.072) supports the hypothesis that *students will find it more acceptable for them personally to cheat when using IT than for others to cheat when using IT.*

The sixth hypothesis H6: Students will find it more acceptable for them personally to cheat when not using IT than for others to cheat when not using IT.

All responses for cheating without the use of IT for the students personally (a total of 5 questions) were compared to all responses for cheating without the use of IT for others (a total of 5 questions). Again, because all respondents responded to questions regarding cheating with the use of IT both for themselves and for others, the paired *t*-statistic analysis was used to evaluate data. The individual differences $(D) = \mu_{(\text{of all responses for cheating without the use of IT for me personally})} - \mu_{(\text{of all responses for cheating without the use of IT for others})}$ were used for the analysis. The hypotheses for this paired *t*-statistic were

H_0: $\delta_0 = 0$: (there were no differences between $\mu_{(\text{non-IT, personally})}$ and $\mu_{(\text{non-IT, others})}$)
H_1: $\delta_0 \neq 0$

Note δ_0 was the mean of the population differences. The mean of the population differences between myself (mean = 1.90, std. dev. = 0.636) and others (mean = 2.02, std. dev. = 0.668) without the use of IT-based questions was −0.115 with a standard deviation of 0.420. The computed test statistic (*t*) had a value of −7.275, so the null hypothesis was rejected at $p < .05$, which meant that there were differences between $\mu_{(\text{non-IT, personally})}$ and $\mu_{(\text{non-IT, others})}$. The paired *t*-statistic analysis with the mean of the population differences (−.115) shows that although there is a significant difference it is actually the reverse of the stated hypothesis, i.e., *students will find it more acceptable for others to cheat when not using IT than for them personally to cheat when not using IT.*

The analysis of these three hypotheses suggest that the students in this study differentiate between cheating personally and others cheating but in different ways when IT is involved. The students held themselves to a higher ethical standard in regards to cheating than they do other people when IT is not involved. However, when IT is involved, these students found it more acceptable for them to personally cheat than for others to cheat. Further research in this area needs to be done to determine why the students perceive it is more acceptable for them to personally cheat when using IT.

Conclusions and implications

It appears from this analysis that undergraduate students in general find cheating using IT more acceptable than cheating without the use of IT, at least in terms of intellectual property violations. Students seem to find it more acceptable for them to personally cheat when using IT than when not using IT. However, students do not perceive that same difference for others. They seem to regard cheating for others the same with or without the use of IT. That is for others, cheating is cheating, but for themselves they may make a justification for cheating when IT is involved. We did not find any significant differences for any of these hypotheses between the responses of business students and non-business students.

In general, students do not find it more acceptable for them personally to cheat than for others to cheat. However, it does appear that undergraduate students perceive that it is relatively more acceptable for them to personally cheat when using IT than for others to cheat when using IT. On the other hand, when IT is not involved this is reversed. Students find it more acceptable for others to cheat than for themselves when IT is not involved. The students appear to have a different ethical standard when IT is involved.

IT ethics is an area in which change is needed. Much research toward that end, in both student attitudes and behaviors and in employee behaviors, remains to be done. Our study results show that undergraduate students in general find it more acceptable to cheat using IT than to cheat without using IT. This suggests that the traditional ethical beliefs of the undergraduate students in our sample contradict their behaviors regarding the use of IT to cheat and engage in intellectual property violations. The question arises: does this phenomenon follow the students after they graduate and enter the work force; and how does it manifest itself within the work environment?

First, in business organizations IT ethics is often an uncharted area, and guidelines and rules of conduct, if present, vary widely across organizations.

It appears that IT ethics are different from traditional ethics among IT professionals in business organizations, just as they are in our student sample. In fact, recent studies have revealed that IT ethics in business organizations are frequently problematic. In 2007 (Harbert, 2007) for example, the Ponemon Institute reported that in a survey of over 16,000 experienced IT professionals, 62% said that they had accessed another person's computer without permission; and 42% said they had knowingly violated their company's privacy, security, or IT policies. More than one-third of respondents said they still had access to their former employers' networks, even after they had left the company. This is particularly disturbing, because to know that they still had access implies that they tried it, which would be distinctly unethical.

Second, it should be pointed out that today's students become tomorrow's employees, and as long as students support less ethical behaviors when using IT than when not using IT, those attitudes will most likely be carried along as they become business and industry's employees. This will not improve the practice of IT ethics in organizations. How might we begin to improve IT ethics in practice in the work force? According to Barquin (Harbert, 2007), information technology can create the illusion that a specific action or behavior is all right because it distances the individual from consequences of that action or behavior. Perhaps introducing coverage of IT ethics into university and college curricula could help dispel this illusion and pave the way for constructive growth. In addition, although codes of ethics exist in various disciplines, such as accounting or law, there are no specific codes of IT ethics to guide IT professionals (Harbert, 2007). General codes of ethics certainly exist, but not a code of IT ethics.

With a twofold research approach of modifying students' IT ethics through curriculum changes and at the same time developing a standard code of IT ethics that can be used in business and industry, it will be possible to help business organizations improve the way their professional IT workers approach and deal with IT-related ethical situations in their organizations. Incoming employees, after receiving appropriate coverage of IT ethics in their university and college educations, would be more supportive of IT ethics within the context of their employment.

Limitations

One limitation of this study is the questionnaire. Although not included in the analysis, questions 6 and 12 on the survey had to be thrown out due to the ambiguity in the wording. In addition, questions 4 and 15 ask about the physical removal of an item (i.e., shoplifting a CD or computer disk) for the non-IT question which would compare to the IT question about music downloading which regards only intellectual property rights. It is possible that a better comparison could have been used. We acknowledge that additional questions may also have been useful, but we also recognize the trade-off between simplicity and detail. Many students tire in completing a long questionnaire and if the questionnaire is too long the students will either fail to complete the survey, will not fully address each question, or will answer the questions haphazardly without thought just to get done. In future studies, the questionnaire should add in additional questions and some questions should be reworded. In addition, it would be helpful to sufficiently spread out the range of responses so instead of using a 1–5 Likert scale, the scale could be extended to 1–10 or even 1–100. This would portray differences more definitively than does a Likert scale of 1–5.

Another limitation is that we used mainly undergraduate students who were enrolled in an introductory information systems (IS) course. Although this is normally a cross-section of the undergraduate student population, students taking IS courses may feel more comfortable using IT which may have skewed their responses.

In addition, as stated earlier, we can only infer behavioral intentions from the responses. We do not know if these students actually behave unethically, only that these are their reported perceptions.

Future research

This survey also collected additional information on demographics, whether or not the students had taken any ethics courses and amount of time spent on the computer on a weekly basis. Preliminary

analysis of this data show that for this sample, students who have had some coverage of ethics in an IS-related class showed stronger support of IT-related ethical behaviors than students who have not had coverage of ethics in an IS-related class. This opens the door for further research on ethics and curricula; and for subsequent impacts on the workforce when students with improved IT ethics become employed. Further research should be conducted into how IT ethics should be introduced into curriculum and where it should be placed. Research is also needed on what content, and how much, should be included to bring about a significant change in students' attitudes and beliefs about IT ethics. Further, research needs to follow students into business organizations and conduct longitudinal studies as to impacts on the IT ethics as practiced in those organizations over time. A beneficial area of research would study IT ethics in business organizations toward the end of building a code of IT ethics that could be adopted by the professional IT organizations including what a code of IT ethics should look like; what the scope of such a code of ethics should be, how the code of ethics would translate into practice; and what pieces, if any, of a code of IT ethics might already exist.

Future research into what can be done to change unhealthy IT ethical attitudes in students into positive constructive ones is essential. Determining why students feel the way they do about IT ethics and how this impacts the legitimate use of Internet-available materials needs study. Some colleges and universities have introduced information ethics classes into their curricula. It would be useful to learn definitively whether IT ethics are different in students who have had an information ethics class than they are in those students who have not had an information ethics class. This could give us a direction in which to proceed as far as establishing or at least encouraging better IT ethics in students. It could also stimulate research into curriculum issues regarding IT ethics. Further research should be undertaken regarding students in business discipline-related majors as compared with non-business-related disciplines. It would be useful for new research to resolve the contradictions that currently appear in the literature with respect to these two groups of students.

In addition, it would be interesting to explore the general population's views on IT ethics and compare those with college students' views. Further research should explore general public perceptions about downloading software, music, etc., from the Internet without regard for the licensing procedure. Expanding this research beyond the academic setting to the general population would have implications for software companies and all those whose work is available over the Internet.

"Advances in technology and increasingly complex and sophisticated systems do not alter our basic human commitments to ourselves, our fellow human beings, animals, and the environment... The situations have changed, but the principles or desired results remain the same." Hauptman and Motin (1994, p. 8)

Appendix

Research Survey Questions 2006–7
Your University or College _____
Your Major _____
Your Gender (please circle): Male Female
Your Age _____

For each question, please circle the response that best reflects your university or college educational experience. (1 = strongly disagree, 2 = disagree, 3 = no opinion, 4 = agree, 5 = strongly agree)

1. It is okay for me to download or copy copyrighted music/software/computer games for my own personal use without complying with the licensing agreement.
2. It is okay for me to copy an electronic file such as an Excel spreadsheet and submit it to a class as my own work for a grade.
3. It is NOT okay for someone other than myself to copy written homework (such as math or accounting problems or computer programs) from someone else and submit it to a class as his/her own work for a grade.
4. It is okay for me to shoplift a CD or computer disk.
5. It is okay for me to share answers to a quiz or an exam with other students who have not yet taken the quiz or exam.

6. It is okay for someone other than myself to submit a friend's paper or part of a paper to a class as his/her own work for a grade.
7. It is NOT okay for me to use a Personal Data Assistant (PDA) or text messaging on a cell phone or ipod or other device to get an answer to a question when it is not allowed during a quiz or an exam.
8. It is okay for someone other than myself to use a Personal Data Assistant (PDA) or text messaging on a cell phone or ipod or other device to get an answer to a question when it is not allowed during a quiz or an exam.
9. It is okay for someone other than myself to copy an electronic file such as an Excel spreadsheet and submit it to a class as his/her own work for a grade.
10. It is okay for someone other than myself to purchase a term/research paper from the Internet and submit it to a class as his/her own work for a grade.
11. It is okay for someone other than myself to share answers to a quiz or an exam with other students who have not yet taken the quiz or exam.
12. It is okay for me to submit a friend's paper or part of a paper to a class as his/her own work for a grade.
13. It is okay for someone other than myself to look on another student's paper and take an answer for his/her own use during an exam.
14. It is okay for someone other than myself to copy material from a book, periodical, or newspaper (without citing it in his/her work) and submit it to a class as his/her own work for a grade.
15. It is okay for someone other than myself to shoplift a CD or computer disk.
16. It is okay for me to copy written homework (such as math or accounting problems or computer programs) from someone else and submit it to a class as my own work for a grade.
17. It is okay for someone other than myself to download or copy copyrighted music/software/computer games for my own personal use without complying with the licensing agreement.
18. It is okay for me to copy text or images from the Internet (without citing it in my work) and submit it to a class as my own work for a grade.
19. It is okay for someone other than myself to copy text or images from the Internet (without citing it in his/her work) and submit it to a class as his/her own work for a grade.
20. It is okay for me to look on another student's paper and take an answer during an exam.
21. It is NOT okay for me to copy material from a book, periodical or newspaper (without citing it in my work) and submit it to a class as my own work for a grade.
22. It is okay for me to purchase a term/research paper from the Internet and submit it to a class as my own work for a grade.

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