

TECHNOLOGY PERVASIVENESS AND THE RELATION TO REPORTED  
INFRACTIONS OF ACADEMIC INTEGRITY AND CODES OF STUDENT  
CONDUCT AT PRIVATE COLLEGES AND UNIVERSITIES

*Institute for College Student Values*  
*February 8-10, 2007*  
*Tallahassee, Florida*

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## **Introduction**

College and university campuses change in part due to external factors that influence and shape the higher education environment. Factors such as the G.I. Bill, the women's movement and technology have each influenced higher education in the 20<sup>th</sup> century. In 1944 the G.I Bill of Rights, also known as the Servicemen's Readjustment Act, was voted by Congress to finance college education for United States war veterans, which sparked an increased enrollment. As a result, many colleges and universities grew larger and egalitarian, and ultimately access to higher education was no longer viewed as the exclusive province of the wealthy and privileged. In 1970 the women's equality movement took form in the United States. The movement saw single-sex institutions becoming co-educational. By the end of the 20<sup>th</sup> century, the majority of students attending and graduating from institutions of higher education were women. Technology was introduced on campuses in the early 1980s creating new teaching and learning modalities. In 1989, seven universities in the United States and Europe created a computer hook-up which was labeled the "multi-university," thereby generating a computer movement on college campuses (Brubacher & Rudy, 1999). With the advent of campus technology, however, corresponding problems arose. For example, the multi-university and advances in computer technology, such as the World Wide Web, email, instant messaging and others may have compounded issues of plagiarism, cheating and student discipline.

Plagiarism and cheating have been found on campuses since the onset of early – American higher education (Brubacher & Rudy, 1999). They remain in the forefront in the 21<sup>st</sup> century. For example, in the November 14, 2003 issue of *The Chronicle of*

*Higher Education*, Jeffery Young authored an article “Student Engagement in Learning Varies Significantly by Major Survey Finds.” In the article, Young reported that the survey creator, Dr. George Kuh, believed that “the biggest surprises came from 18 new questions about the impact of technology on learning.” Kuh’s study found 87% of 60,000 respondents said that their peers had copied and pasted materials from the Internet into their academic papers sometimes without proper attribution (Young, 2003). Campbell (2006) reported that since 2002 Dr. Donald McCabe had surveyed more than 50,000 students on more than 60 campuses, finding that 70 % of students admitted to cheating with more than half admitting to one or more instance of serious cheating on written assignments (Campbell, 2006). As a result of findings such as Kuh’s and McCabe’s, institutions are beginning to use mechanisms such as turnitin.com, a resource for faculty to see if the whole or parts of a paper have been plagiarized. Also, many institutions are implementing academic integrity review boards which are premised on their honor codes.

### **Brief Literature Review**

McCabe and Bowers (1994) report findings that suggest that the media reports of dramatic increases in cheating may be unfounded. Student academic dishonesty has been the subject of research but most studies have yielded little insight into general patterns of cheating. Leming (1980) revealed that cheating does not appear to be related to a student’s academic ability. McCabe and Bowers (1994) compared self reported cheating behavior of fraternity and non-fraternity membership. Their conclusion was that fraternity members cheated more than non-members; however, they also concluded that cheating would not change if Greek organizations did not exist. .

Few studies of actual cheating behavior have been published because it is much easier to study attitudes, definitions and justifications; rather than to study a behavior that is intentionally hidden (Pullen, Ortloff, Case & Payne, 2000). Modest data helps college faculty and administrators understand how cheating and plagiarism has changed over time. Academic dishonesty has been around for many years; however, the scope of the problem has been broadened. Students see that plagiarism is morally neutral and faculty have become more accepting. Although academic dishonesty has a long and dishonorable history in academic life, some of the reasons students' cheat or plagiarize have become more complex. The complexity of the issues is in part due to technological advances. It is also complex because few institutions release the details of student-conduct hearings, so it is difficult to determine how many accusations of student behavior involve technology (Read, 2004).

### **Research Rationale**

Technology played a critical role in higher education in the 20<sup>th</sup> century. It will continue to play a critical role in the 21<sup>st</sup> century fostering good and evil alike. It was important to investigate how technology pervasiveness affected student behavior in academic and non-academic conduct. As colleges and universities increase technology availability and accessibility, one might also expect that they will become susceptible to technological crime. The Internet fosters technology crimes on campuses today as portrayed in the following scenarios shared by judicial affairs officers. On one campus a student reported that she received a harassing email from an ex-boyfriend. Throughout the country, various websites are being created to target "hit lists" of people whom students want to harm, injure, or even murder. It was reported that a student invaded

another student's "computer space" by tapping into the student's files saved in a shared folder that was password protected. In addition, at the same campus, another individual accessed university software and passwords and began to tamper with the University mainframe system. A further example occurred when a student lab assistant misappropriated computer hardware and used it for personal use, as well as for financial gain. These infractions are puzzling university disciplinarians and thus becoming familiar to administrators on college campuses. With advances in technology, new challenges will potentially face campus administrators. However, a difficulty about technology assisted infractions seems to stem from lack of incidents being reported to campus authorities. In the same way that incidents of rape and harassment were initially underreported, technology assisted infractions may also go unreported. Indeed, when technology is available and accessible on campus and more students appear with computers, cellular telephones and personal digital assistants, then one might reasonably expect that potential infractions of honor codes and codes of student conduct will test student integrity.

### **Statement of the Problem**

As incidences of infractions related to academic integrity and student behavior are affected by technology, further research was needed to see how technology pervasiveness is impacting our college and university campuses. Therefore this study attempted to assess the effect that technology and its pervasiveness had on student behaviors related to academic integrity and codes of student conduct at private institutions of higher education.

## **Theoretical Perspective**

Young adults, particularly those enrolled in college, are complex and ever changing. To understand why students behave as most do in a college environment, an understanding of basic human development theory is a necessity. Human development of traditional age college students is multifaceted. Earlier studies suggest that this complex system was devised through analysis of various developmental theories or sets of interrelated plans about how development occurs over the life span (Rodgers, 1977). Because substantial research is the basis for theoretical explanations of phenomena such as thinking, feeling and behaving, several theories may help explain an issue related to traditional age student development.

Pascarella and Terenzini (1991) along with Chickering and Reisser (1993) suggested that student development theory is shaped by four primary theoretical contexts: psychosocial, cognitive, typology, and person-environment interaction. For the purpose of this study, the theoretical context of cognitive development will be briefly discussed along with theories of moral development and student development. In addition, person-environment interaction theory will provide theoretical connections from student development theory to this study.

### *Cognitive Development*

Cognitive development has been a focus of social science research for much of the 20<sup>th</sup> century. Cognitive development refers to a set of assumptions and research strategies common to a variety of specific theories of social and cognitive development. This theory examines developmental phenomena in how humans reason, think and make meaning out of experiences in everyday life. Structure is a basic component in cognitive

development theory (Rodgers, 1977). Structure acts as a set of assumptions, which operates as a filter for how individuals perceive, organize, and evaluate experiences and events. These same structures will influence how an individual behaves and feels.

It is important to underscore the fact that cognitive development theory alone will not fully illuminate or adequately explain the development of college students. Love and Guthrie (1999) write that cognitive development theory is often considered simultaneously with other models, such as: consideration of student development, psychosocial development, moral development and identity development theories. These theories assist with the design of environments and structuring of interactions and relationships to facilitate both cognitive growth and development.

#### *Moral Development*

Research reveals that when viewing moral development, the most significant contributions stem from the work of Lawrence Kohlberg, a scholar of the Piagetian construct. Kohlberg interpreted Piaget's work as talking to children about fundamental matters in moral philosophy (Crain, 1980). Kohlberg's works included development of theories of cognitive development based on moral reasoning. Piaget's theories of moral judgment identified a series of developmental stage changes that occur most often between the ages of 10 and 12. According to Crain (1980) Kohlberg's research showed that humans move in an invariant sequence, from stage to stage, dealing with varied cognitive structures to analyze and judge courses of action in arriving at moral solutions. Moral development, as initially defined by Piaget and then refined by Kohlberg, does not simply represent an increasing knowledge of cultural values usually leading to ethical relativity, rather, it represents the transformations that occur in a person's form or

structure of thought (Kohlberg & Hersh, 1977). The stages Piaget and Kohlberg identified are similar in some respects. In each, a shift occurs from obedience to a relativistic outlook and ultimately to the concern for good value based motives. The developmental phase is noted as a vital stage in pre-adolescent maturity. In this phase, individuals begin to distinguish between right and wrong, develop values (good and bad), and understand the concept of integrity as each relates to the experience of learning. Perry's (1970) model of intellectual and ethical development describes students as moving away from dualistic, black and white thinking and becoming more liberal as they are exposed to different viewpoints. His theory is one that helps to shape student development as it relates to the research topic.

### *Student Development*

Student development theory has generally been adopted as the guiding theoretical framework for the research and practice of the student affairs profession (Astin, 1977, 1993, Chickering & Reisser, 1993, Kuh, Schuh, Whitt & Associates, 1991, Terenzini, Pascarella & Blimling, 1999). Student development is a broad term used to describe the varied stages of cognitive, psychosocial and moral growth and development of young adults enrolled in colleges and universities. All such stages, either implicitly and intuitively or explicitly and formally, make assumptions about the nature of college student development (Creamer, 1980). An understanding of the primary student development theories has increased the understanding of student behavior, growth and socialization in the college environment and has also stimulated research in the field (Pascarella & Terenzini, 1991; Love & Guthrie, 1999). Student development theory integrates theories of human development with significant influences within the college

experience. Chickering (1969) and Chickering and Reisser (1993) describe seven vectors of student development: 1) developing competence, 2) managing emotions, 3) moving through autonomy toward interdependence, 4) developing mature interpersonal relationships, 5) establishing identity, 6) developing purpose, and 7) developing integrity. Each vector serves as a path for a college student's experience. However, the student's experience is influenced by factors that impact student development such as clear and consistent institutional objectives, institutional size, student-faculty relationships, curriculum, teaching, friendships and student communities, and programs and services provided by the institution.

These theories of cognitive, moral, and student development form a skeleton for how and why university communities develop standards for learning. Students in the educational community who compromise standards, particularly of academic integrity and responsible behaviors of the student code of conduct, deserve closer study. This can be further developed through an understanding of person-environment interaction theory.

#### *Person-Environment Interaction*

Human development goes beyond the direct observation of behavior on the part of one or two persons in the same place. It requires examination of multiperson systems of interaction and must take into account aspects of the environment beyond the immediate situation containing the subject (Bronfenbrenner, 1977). Perhaps one of the most noted interactionist is Kurt Lewin. In 1936, Lewin formulated that behavior is a function of the interaction of person and the environment (Evans, Forney&Guido-DiBrito, 1998). Bronfenbrenner (1977) and Moos (1979) expand on Lewin's formulation and categorize an individual's interaction with the environment as the social atmosphere in which

individuals have experiences. Moos divides environment into three categories: relationship, personal growth or goal orientation, and system maintenance or system change. These categories in conjunction with the ecological setting of human development (factors of place, time, physical features, activity, participant and role) of Bronfenbrenner (1977) take into consultation that the person environment interaction is affected by relations obtained within and among these immediate settings. Understanding the relationship between students and some aspect of their environment at times involves introducing a change agent into the equation. Implicit in the equation is the recognition that the relations between the person and the environment that are in a balanced state will become unbalanced at some point. When a new variable is introduced to the environment, the environment may become susceptible to problems. Technological advances have been introduced to the college and university environment over the years; these advances are both useful and problematic.

### **Methodology**

This exploratory study was designed to incorporate a mixed methodology model of measurement. This method was selected because it best addressed the overarching research question and 10 sub-questions identified in the study.

The sample consisted of 125 private institutions of higher education from the states of New Jersey, New York and the Commonwealth of Pennsylvania (Tri-State area) identified by using Carnegie Classification and the Integrated Post Secondary Data Systems (IPEDS) database. Institutions categorized as Masters College and Universities I, Master Colleges and Universities II, Baccalaureate Colleges- Liberal and Baccalaureate Colleges- General were included in this study. The researchers institution was not

included in this study; thereby, making the sample 124. In each of the 124 institutions, individuals identified as the Chief Academic Officer (CAO), Chief Student Affairs Officer (CSAO), and Chief Information Officer (CIO) were selected as survey respondents. The *2004 Higher Education Directory* was the source for obtaining those names. If names were not provided, or the appropriate officer was not easily identifiable, a telephone call was placed to that institution seeking clarification.

### **Research Questions**

The overarching research question identified for this study was: What is the relation between technology pervasiveness and reported infractions of academic integrity or a code of student conduct?

Several sub-questions were also been identified for this study:

1. What is the relation between computer technology and reported infractions of academic integrity?
2. What is the relation between computer technology and reported behavioral infractions of a code of student conduct?
3. What is the relation between Internet access and reported infractions of academic integrity?
4. What is the relation between Internet access and reported behavioral infractions of a code of student conduct?
5. What is the relation between cellular telephones and reported cases of cheating?
6. What is the relation between cellular telephones and reported cases of misuse of cellular telephones?

7. What is the relation between personal digital assistants and reported cases of cheating?
8. What is the relation between personal digital assistants and reported cases of misuse of personal digital assistants?
9. What methods do institutions have in place to educate students regarding acceptable use of technology on campus?
10. What process is in place at institutions to adjudicate reported infractions of academic integrity or a code of student conduct?

### **Significant Findings**

Results for this study were split. Non-significance was found for several variables used in this research study; other variables were significant. These findings support the mixed results and perception reported in the literature. The study contributes to the research knowledge base for higher education practitioners, faculty and university administrators.

It is, however, also important to look at the results of those variables and questions that were significant in this study. The conclusions begin by looking at significance from those reporting from the CAO group. It will then be followed by those variables reported as significant from the CSAO group.

#### *Chief Academic Officers*

Findings from the Chief Academic Officers showed significance regarding technology pervasiveness and infractions of academic integrity or a code of student conduct. The following variables were significant as reported by CAOs: 1) file tampering, 2) plagiarism, 3) type of plagiarism changing, 4) cheating, 5) plagiarism with

technology, 6) plagiarism using the Internet, 7) computer hacking, 8) tampering with institutional files and 9) other behaviors.

Plagiarism was found to be significant in two separate questions. The first question was the overarching research question in which the relation between technology pervasiveness and reported infractions of academic integrity or a code of student conduct were studied. Plagiarism was significant  $t=-2.42$ ,  $df$  12,  $p=.05$ . Further analysis showed that plagiarism prior to the institution becoming networked and plagiarism after the institution became networked was significant when a paired  $t$ -test was performed  $t=.31$ ,  $df$  40,  $p=.05$ .

The type of plagiarism changing after the institution became networked was significant due to the relation of technology pervasiveness and reported infractions of academic integrity or a code of student conduct  $t=-3.74$ ,  $df$  12,  $p=.005$ . The type of plagiarism changing specifically for reported infractions of academic integrity was significant ( $r=.52$ ,  $p<.01$ ).

The second construct, which defines academic integrity, is cheating. The Internet has had an effect on cheating  $t=.48$ ,  $df$  40,  $p=.00$ . Two additional influences on cheating has been the introduction of cellular telephones and personal digital assistants. CAOs in this study reported 41 cases of cheating using cellular telephones. The majority of the cases (37) were reported by CAOs where the percentage of students who had cellular telephones was between 51-100 % which was proportionally different with (4) cases being reported in the 0-50 % range.

Personal digital assistants are relatively new to college-age students. Therefore one would expect that the percentage of students having personal digital assistants to be

low, which was reported by CAOs. One may also surmise that the lower percent of students having PDAs could be because cellular telephones have a greater appeal to college-age students. Even though there is a lower percent of students with personal digital assistants, college and universities are reporting that students are using this device for cheating. A total of four cases were reported in this study, with three of those cases being in the lower percent range (0-50) of students with personal digital assistants.

The introduction of the Internet has provided another way for technology assisted infractions of academic integrity or a code of student conduct. The Internet has made plagiarism, file tampering and computer hacking easier. Plagiarism with technology was significant  $t = .34$ ,  $df 40$ ,  $p = .03$ . In conducting a post hoc analysis, the significance was supported in that CIOs reported their campuses technology pervasiveness to be between 70 and 100% and many of those campuses in that range reported a significant number of ports. In the *post hoc analysis* the number of ports an institution had was added to the equation. A *t*-test was computed and plagiarism using the Internet was again significant  $t = -2.26$ ,  $df 14$ ,  $p = .02$ .

Technology pervasiveness has affected file tampering and computer hacking. File tampering was significant  $t = -2.89$ ,  $df 12$ ,  $p = .02$ . Furthermore, tampering with institution files was significant when the Internet was introduced as the independent variable  $t = .51$ ,  $df 40$ ,  $p = .00$ . When the Internet was introduced as the independent variable with computer hacking, it was also found to be significant,  $t = .43$ ,  $df 40$ ,  $p = .01$ .

#### *Chief Student Affairs Officers*

Findings from the Chief Student Affairs Officers showed significance regarding technology pervasiveness and infractions of academic integrity or a code of students

conduct. The following variables were significant as reported by the CSAO 1) harassment, 2) forgery, 3) computer hacking, 4) tampering with student files, 5) tampering with institution files, 6) theft of software, 7) theft of hardware and 8) other behavioral infraction.

In conducting the *post hoc analysis* for the overarching question, CIOs reported their campuses' technology pervasiveness to be between 70 and 100% and many of those campuses in that range reported a significant number of ports. The number of ports the institution had affected harassment  $t=-2.01$ ,  $df\ 21$ ,  $p=.02$ . Therefore, the more ports an institution has the more likely students are using technology for harassment of others.

The introduction of the Internet has provided another way for technology assisted infractions of academic integrity or a code of student conduct. Seven variables were significant as related to Internet access and reported infractions: forgery  $t=.38$ ,  $df\ 43$ ,  $p=.01$ , computer hacking  $t=.39$ ,  $df\ 43$ ,  $p=.01$ , tampering with student files  $t=.33$ ,  $df\ 43$ ,  $p=.03$ , tampering with institution files  $t=.34$ ,  $df\ 43$ ,  $p=.03$ , theft of institution software  $t=.46$ ,  $df\ 43$ ,  $p=.00$ , theft of institution hardware  $t=.56$ ,  $df\ 43$ ,  $p=.00$  and other behavioral infractions  $t=.83$ ,  $df\ 15$ ,  $p=.00$ .

Cellular telephones and personal digital assistants have been reported by CSAOs as being misused since introduced to college-age students. Similar to findings of cheating reported by CAOs, CSAOs report similar patterns of behavior and misuse. Seven cases of misuse of cellular telephones were reported; six of the cases were reported by CSAOs where the percentage of students who had cellular telephones was between 51-100% of the general student population. Two cases of misuse of personal digital assistants were

reported by CSAOs. Each of those cases were in the lower percent range (0-50) of students with personal digital assistants.

## Study Conclusions

This study revealed that today's private institutions of higher education in the states of New Jersey, New York and the Commonwealth of Pennsylvania are educating students on academic integrity and responsible use of technology. However, as seen within each of the questions investigated in this study, it was evident that infractions of academic integrity and a code of student conduct are occurring on campuses today as reported by the CAO and CSAO.

### Conclusions

- CAO
  - File tampering
  - Plagiarism
  - Type of plagiarism changing
  - Cheating
  - Plagiarism with technology
  - Plagiarism using the internet
  - Computer hacking \*\*
  - Tampering with institutional files
  - Other behaviors
- CSAO
  - Harassment
  - Forgery
  - Computer hacking \*\*
  - Tampering with student files
  - Tampering with institution files
  - Theft of software
  - Theft of hardware
  - Other behavioral infractions

\*\* denotes that these behaviors were reported by both CAOs and CSAOs

In investigating infractions of academic integrity it was evident that institutions are reporting infractions. The results from the overarching question, the *post hoc analysis* and sub-questions one, two, six, seven, and eight all support the fact that

institutions are reporting infractions. The most prevalent infraction reported in results from this study falls under the guise of plagiarism. Plagiarism itself was significant in two of the sub-questions. The type of plagiarism after an institution became networked was significant in two sub-questions as well. Plagiarism with technology and plagiarism using the Internet was significant in one sub-question. While plagiarism was significant, cheating as well yielded significant results. Other infractions, while not specifically listed in the responses reflected significance.

Behavioral infractions such as: 1) computer hacking, 2) forgery, 3) institution file tampering, 4) student file tampering, 5) harassment, 6) theft of hardware, 7) theft of software and 8) other behavioral infractions were significant within the sub-questions. Harassment was significant in two of the questions posed in this study. All other behavioral infractions, while not specifically listed, were significant.

Newer technologies, cellular telephones and personal digital assistants, were significant with regards to their influence on infractions of academic integrity and a code of student conduct. Significance was found in the reporting of infractions using cellular telephones and personal digital assistants. While the number of cases of cheating or misuse was low in some cases, due to the number reported by the CAO in the study, there does seem to be correlation; new technologies are affecting infractions of academic integrity and a code of student conduct.

Although students are educated about academic integrity and acceptable use of technology early on in the orientation process as reported by 21 institutions in this study, infractions are still occurring. In order to address infractions as they arise, these 21

institutions reported that they do adjudicate those reported infractions either through the judicial process, through the academic dean or by utilizing the honor code.

Perhaps the best way to summarize what is needed as a result of this study would be from an excerpt from The Carnegie Foundation for the Advancement of Teaching's special report, *Campus Life: In Search of Community*. It concludes, "What is needed, we believe is a larger, more integrative vision of community in higher education. ... a place where individuals accept their obligations to the group and where well defined governance procedures guide behavior for the common good." Institutional administrators need to incorporate the values of honesty, trust, fairness, respect and responsibility into their everyday vocabulary and academic policy thereby accepting the mission set forth by Carnegie. In doing so, a strong academic integrity system would aspire to be the closest possible congruence of faculty and students understanding of those values on their campus and thus creating a reinforced educational mission and academic process (Drinan, 1999). This vision should be integrated into academic integrity and codes of student conduct to deter technology assisted infractions of academic integrity and student behavior infractions of a code of student conduct.

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