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**Keywords:** Technology, Classroom learning environment, Pharmacy education

**Abstract**

*The use of technology in the classroom may have positive and negative effects on learning. The purpose of this investigation was twofold: to identify the effect technology is having on the pharmacy learning environment; and, to assess students' use of technology during class time for non-academic purposes. This study included a national cross-sectional survey as well as a single, college-specific survey. The national survey had a faculty response rate of 71.2%. Of the responders, approximately 61% identified significant problems related to students' use of technology in the pharmacy learning environment. Cell phones were a recognized concern and more than 90% of programs have chosen to restrict cell phone use in the classroom. The single college survey examining technology use during class for non-academic purposes had a student response rate of 87% and faculty response rate of 100%. Students and faculty members disagreed regarding the negative effects of technology use during class for non-academic purposes. Notably, 16% of students acknowledged their in-class use of technology for non-academic purposes had been disruptive to their learning, as compared to 95.7% of faculty. According to students, common reasons for off-task technology use included checking e-mail/text messages (75.1%), lack of engagement (58.1%), multitasking (56.2%), and accessing social media sites (33%). Faculty and students were asked about enforcement of technology policy. More faculty than students supported policy enforcement by faculty (65.2% versus 22.8%, respectively; p<0.001) as well as policy enforcement by students (78.3% versus 31.9%, respectively; p<0.001). Overall, technology use during class for non-academic purposes was common. Many schools and colleges of pharmacy are developing approaches to address these evolving issues by revising their technology use policies.*

## Introduction

Technology use is widespread and has transformed society in countless ways. Students have embraced the use of technology both in and out of the classroom, and data suggest a rich and complex interrelationship between the individual and these tools.[1]

In pharmacy schools around the country, technology has been integrated into the classroom to assist in the delivery of material, enhance communication, and engage students while learning.

Studies have reported extensive use of educational technologies including course management software, audience response systems, electronic testing, web conferencing, classroom capture systems, interactive video conferencing, and document collaboration.[2,3] Pharmacy faculty have described various types of technology implemented in the classroom setting that have enriched student learning.[4-7] Other research has focused on faculty and students' satisfaction and perceived effectiveness of educational technologies utilized in pharmacy education.[8-13]

Technology appears to be changing the pharmacy educational environment and creating opportunities for learning. Yet, with all of the positive advances that technology has produced, it also presents potential challenges.[14]

Technology provides new ways for students to be taught and gain greater access to information, but could this increased use of technology in the classroom have an adverse effect on student learning? For example, are students using technology to commit academic misconduct? With search engines providing answers with the click of a mouse, could this instant access to information hinder the development of students' critical problem solving skills? An answer found

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rapidly and thoughtlessly may not be retained, thus limiting the achievement of deeper learning. Are laptops and cell phones becoming a distraction in the classroom? Pharmacy students report using electronic devices during class for course-related activities, but also report using such devices for non-academic purposes.[15] Although many colleges and schools of pharmacy have embraced the use of technology in their courses, some faculty have chosen to ban technology (e.g., laptop computers) from their class because of difficulties inherent with a highly connected classroom.[16]

There is a paucity of published studies specifically focusing on the challenges of technology use in the pharmacy classroom.[15] Likewise, a literature search revealed no studies exploring student and faculty perceptions of technology use during class for non-academic purposes in relation to student learning. As a result, further investigation of these topics was warranted. Specifically, a nationwide survey of pharmacy faculty was undertaken to ascertain whether technology use is having negative consequences on student learning. Similarly, what, if anything, is being done by faculty to resolve these issues? Additionally, is there any impact on learning when students utilize technology for non-academic purposes during class? Do students perceive the same level of disruption as do the faculty teaching the course? A preliminary investigation was conducted at a school of pharmacy to examine these important questions.

The purpose of this investigation was to: 1) to identify the effect that non-academic technology is having on the pharmacy learning environment; and, 2) to assess students' use of technology during class time for non-academic purposes.

**Methods**

The investigation involved two separate studies. The first part of the investigation entailed a national cross-sectional survey regarding technology use within colleges and schools of pharmacy. This was conducted to obtain a broad perspective. The second part of the investigation was undertaken at a single college of pharmacy to collect both students' and faculty members' perspectives on the use and misuse of technology in the classroom.

*National Cross-Sectional Survey*

The national cross-sectional survey was used to identify the effect technology is having on the learning environment and how programs are administratively responding to this evolving issue. The survey instrument included six items and it was created specifically for this investigation by the Chair and several members of the Technology in Pharmacy Education and Learning (TiPEL) Special Interest Group (SIG) of the American Association of Colleges of Pharmacy (AACP). This group's intent was to develop a national database of educational technology use and identify issues that have arisen with its implementation. A table of specifications was generated to ensure that each domain was represented. The domains of interest were: student use of technology for non-academic purposes (including examples of use that detracted from the learning environment and frequency of occurrence), cell phone use during class, occurrence of plagiarism, policies implemented as a response to these challenges, and occurrence of technology having a positive impact in the classroom. The survey was pilot tested by one psychometrician and three pharmacy educators from across the country with experience in survey development and educational technology, respectively. The purpose of the pilot phase was to test the adequacy of the instrument to meet stated goals and to improve the internal validity of the survey. The pilot group identified ambiguities and difficult questions, determined if the time required to complete the survey was reasonable, and assessed whether each question gave an adequate range of responses. Pilot data were used to: confirm that the survey items provided the information sought; discard unnecessary, difficult, or ambiguous questions; and, reword questions that were not answered as expected. The Institutional Review Board (IRB) at Creighton University School of Pharmacy and Health Professions approved the study.

The survey was administered via Vovici (Verint Systems Inc., Melville, NY) to a convenience sample of 118 faculty in the TiPEL SIG of the American Association of Colleges of Pharmacy. It specifically included members representing programs that were deemed to be at a level of development sufficient to have employed educational technology (i.e., fully accredited programs). Only one person from each program received the survey request. The survey request was sent to the person whose job title was most likely associated with education technology. If the SIG member was not able to complete the survey, they were asked to forward it to another faculty member at their institution. Survey instruments were disseminated electronically (implied informed consent was obtained in the survey introduction) and electronic reminders were sent periodically to those who had not responded. Quantitative responses were exported to a Microsoft® Excel spreadsheet before analysis via IBM SPSS Statistics, version 18.0.2 (IBM SPSS, Chicago, IL). Descriptive analyses were conducted. Qualitative responses (open-ended questions) were reduced to a Microsoft® Word document. Data reduction and latent content analysis were performed by one author (MSM) and a psychometrician using a modified method delineated by Morse.[17] The open-ended data were initially coded using broad categories or groupings. Then

these broad categories were more precisely defined in content to move from open coding to axial coding.[18,19] The last stage involved synthesizing the grouped data into themes.

*Single College of Pharmacy Survey*

The second part of the investigation examined students' use and related perceptions of technology during class time for non-academic purposes at one college of pharmacy (East Tennessee State University). This pharmacy institution has a 4-year professional program with a minimum of 2 years required in pre-pharmacy prior to application. The average class size is 80 students.

The established student handbook at the institution addressed student technology use in numerous ways: 1) a professional outcome statement that embraced the use of technology to enhance the practice of pharmacy; 2) a requirement that students purchase a laptop computer with internet access; 3) a condition that fourth-year students purchase a handheld device loaded with Lexi-Comp®; and 4) a technology policy related to the use of communication devices in the classroom. The technology policy specifically stated that students may not use electronic devices during class time for non-academic purposes, including communication.

The survey instruments were designed for quality improvement purposes and were approved by the Institutional Review Board (exempt review) at East Tennessee State University. A waiver of the consent process was granted by the IRB and the survey was administered to students and faculty members. Questions were developed and vetted by the study team and focused on six domains: awareness of policy, frequency of technology use during class for non-academic purposes, frequency of disruption, severity of disruption, rationale for technology use during class for non-academic purposes, and policy enforcement. Questions were drafted and then revised, with redundant and/or unnecessary questions removed. The Likert scale questions were asked to both students and faculty. The student survey consisted of 28 items: Awareness of policy (1), Frequency of disruption (4), Severity of disruption (3), Frequency of use (7), Reason for use (11), and Policy enforcement (2). The faculty survey included 23 items. Once surveys were finalized, the student survey was launched to first, second, and third year students separately during a convenient time within the schedule. The surveys were collected anonymously at the end of a class period when the professor had left the room. Completion of the survey did not affect students' grades in any way. Students determined whether or not to participate and all information was collected anonymously using the TurningPoint® audience response system. SurveyMonkey (SurveyMonkey, Palo Alto, CA) was used to survey faculty members anonymously.

Categorical data were compared between groups using a chi square analysis with statistical significance defined as $p<0.05$ (SigmaPlot 12.0; Systat Software Inc (SSI); San Jose, CA).

**Results**

*National Cross-Sectional Survey*

Eighty-four surveys from different programs were returned for a response rate of 71.2%. Of the respondents, 47 (56%) represented public programs and 37 (44%) private programs. Respondents represented all geographic areas of the country: Eastern programs 28 (33%), Western programs 11(13%), Midwestern programs 23 (27%), Southern/southeast programs 14 (17%), and Southern/southwest programs 8 (10%).

One question asked if schools of pharmacy had significant problems with students using technology for non-academic activities while in class or on rotation. Fifty-one (61%) respondents identified significant problems at their institution related to student use of technology in the learning environment (Table 1). Respondents were asked an open-ended follow up question to explain specific issues that detracted from the learning environment. Seventy-four (88%) of respondents reported concerns with students' non-academic related use of technology in the classroom for web surfing (e.g., shopping, watching videos, gaming, viewing sports websites, and looking at pictures); sixty-four (76%) respondents reported issues with students' use of social media/networking (e.g., Facebook™ and Twitter™); and, eighteen (21%) respondents reported problems with the students' use of cell phones for e-mailing, instant messaging, and texting. An open-ended survey question asked about the frequency that students engage in these activities during class and the respondents reported ranges from "rarely" and "not significantly" to students "routinely misusing devices in the classroom in every way possible."

Another survey question dealt with students' access to cell phones. Cell phone use in the classroom was restricted in some form by 77 (91.7%) of the pharmacy programs represented, with limitations primarily being determined by individual instructors. Schools commented on their decisions to ban cell phones. Common themes were students' use of cell phones for non-academic purposes during class which distracted other students; concerns about the use of cell phones to cheat during exams; and, students using cell phones to keep track of time during examinations.

The survey also asked questions regarding technology and student plagiarism. Many respondents (52, 61.9%) used plagiarism detection software. Internet-based plagiarism detection services, such as Turnitin™ (15, 17.9%) and SafeAssign™ (5, 6.0%), were the most frequently used products. Use of these services occurred at the discretion of individual instructors.

Respondents were asked an open-ended question about new policies implemented because of the introduction of technology. Thematically, the technology policy responses centered on four areas: intellectual property/copyright policies because of the addition of classroom capture capability (38, 45%); policies addressing the use of course learning tools (18, 21%); academic honesty policies addressing computer-based examinations (15, 18%); and, the presence of technology devices (cell phones, etc.) in the classroom and during examinations, including use for non-academic purposes during class (11, 13%). Many respondents remarked on classroom-captured recordings: what gets recorded; who "owns" course recordings; how long the recordings are kept; and, who is allowed to view the recordings and when. Some policies centered on mandatory student use of technology; for example e-portfolios and audience response systems (e.g., iClicker™). Other policies required faculty use of technology, such as course management systems (e.g., Blackboard™) and the learning tools incorporated into these applications.

Another open-ended survey question asked respondents to elaborate on any technologies that have positively impacted student learning; that faculty have found to increase the efficiency of the education enterprise; and, that are perceived by students to improve their education. Responses ranged from "all are having a positive outcome on learning" to ""we have tried many technologies under the perception that students learn differently than in the past -- we have not seen any differences with or without technology, except costs are vastly different!" Most comments centered on lecture capture for delayed or repeated viewing (36, 43%), audience response systems for immediate assessment of student comprehension (30, 36%), course management systems and integrated tools (20, 24%), classroom captures for delayed viewing, and, audience response systems for immediate assessment of student comprehension and teleconferencing use (8,10%).

Comments also supported the use of audience response systems: "Students have reported that using clickers improves their learning," and "While its use is still in a pilot phase, the use of Audience Response Technology (ARS) has been reported to improve interaction during class sessions and information retention." Other reported successes included the implementation of web-based tools for rotations (student placement and evaluation), wireless access, communication tools (podcasting, YouTube™), smart technologies in the classroom, and simulation studios (virtual patients, patient simulators).

*Single College of Pharmacy Survey*

For this portion of the investigation, student and faculty response rates were 87% (n=205) and 100% (n=23), respectively. Results of certain survey questions are provided in Table 2 and Table 3. A lower proportion of students than faculty members were aware that a technology policy already existed [82, (40.1%) versus 15, (65.2%), respectively; p=0.026]. Considering the frequency of technology use during class for non-academic purposes, 127 (61.9%) students reported that they sometimes/frequently use technology for non-academic purposes, whereas 21 (91.3%) faculty members believe this occurs. Faculty believe the frequency of disruption to the student learning is more extensive, and 22 (95.7%) faculty members agreed/strongly agreed that improper technology use is disruptive to the students' own learning as compared to only 33 (16%) students (p<0.001). Notably, 63 (30.7%) students acknowledged classmates' use of technology during class for non-academic purposes has been sometimes/frequently disruptive to their learning.

Figure 1 shows details regarding rationale as reported by students for technology use during class for non-academic purposes. Students were presented a series of statements regarding the use of technology during class time for non-academic purposes and asked to specify the frequency in which they engaged in specific behaviors. The more common reasons for off-task activities included checking e-mail/text messages 154 (75.1%), lack of engagement 119 (58.1%), multitasking 115 (56.2%), and accessing social media sites 68 (33%). Some of the responses related to doing coursework for another class and the learning environment being provided (e.g., lecture oriented rather than active learning).

Since the college had a technology policy already in place when the study was conducted, faculty and students were asked about policy enforcement. Overall, more faculty members than students agreed or strongly agreed the policy should be enforced, specifically by the faculty [15 (65.2%) versus 47 (22.8 %), respectively; p<0.001] or by students [18 (78.3%) versus 65 (31.9%), respectively; p<0.001].

**Discussion**

This investigation sought to identify the effect technology is having on the pharmacy learning environment, to examine how pharmacy programs are administratively responding to

technology use, and to characterize how students are using technology. We performed a national cross-sectional survey that addressed the learning environment and certain administrative responses. The single college of pharmacy evaluation provided detailed information regarding how students are using technology and its potential impact on learning.

Today's college and professional students have grown up immersed in technology. Colleges and schools of pharmacy use various technologies for teaching and have changed to meet the needs of the present technology savvy students. It appears students are comfortable with technology use in academic programs and have a preference for greater use of technology.[12,20] In this digital age, students use the internet for up-to-date facts, videos for instruction or information, and virtual classrooms or voice over internet protocol (VoIP) services to form study groups. Engaged student learners frequently use laptops in the classroom to make annotations to their slide sets or transcribe faculty lectures into documents.

Technology in the classroom may be an efficient and effective approach to enhance learning. There are various ways in which technology can promote mobile learning by engaging students. However, the challenge of managing technology use in the classroom is becoming increasingly difficult. Our national study indicates that the majority of faculty respondents surveyed (51, 60.7%), experienced significant problems regarding students' use of technology during class time for non-academic purposes. Another survey of faculty members, academic administrators, and others in higher education (n=841) found that 82.9% of respondents allow laptops in the classroom and 52% allow smartphones.[21] Respondents commented that problems could arise when the technologies are used in inappropriate ways or at inappropriate times. Of those responding to the question, 57.7% commented they have encountered students accessing Facebook™ and 3.7% mentioned students using Twitter™ to cheat on exams. Furthermore, only 28.4% of respondents stated that their institution has a social media policy. We also found that our survey respondents were concerned with students' technology use during class for non-academic purposes for web surfing (74, 88%), accessing social media (64, 76%), and cell phone use [e-mailing, instant messaging, and texting] (18, 21%).

Another frequently reported difficulty in our survey focused on student cell phone use in the classroom. Cell phones are ubiquitous and were repeatedly cited as a distraction in the learning environment. Students may be unable to concentrate during class and frequently check their phones' clock or text messages. Cell phones may also be used as a vehicle for cheating. Among respondents in our study, more than 30% had an institutional or program policy that bans cell phones. More than 60% of respondents conveyed that their institutions have no clearly defined policy regarding cell phone use during class; the decision is at the discretion of individual instructors to determine course directives. A small number of respondents (7, 8.3%) in our study reported they do not have a cell phone policy.

Our survey also considered the subject of plagiarism. Digital technology (e.g., cut and paste) makes plagiarism easier than ever. A recent review looking at academic misconduct in higher education revealed that of the 58,000 students polled, 48% admitted to cheating on written assignments.[22] Almost 62% of the respondents in our national cross-sectional survey reported using plagiarism detection software at their institutions. This plagiarism software works by checking assignments for sections of identical text. Like any program, these detection services are not 100% foolproof. Furthermore, plagiarism software is available to the general public, so students may use it on their own written assignments before turning them in. Pharmacy programs need to be cognizant of the risks of plagiarism and measures to respond to these challenges.

The second aspect of our study involved a targeted inspection of one university and its students' use of technology during class. This analysis provided more detail regarding students use and misuse of technology during class time.

When examining the use of technology for non-academic purposes in a 50-minute class period, faculty estimated that their typical student sometimes/frequently uses technology during class for non-academic purposes (21, 91.3%), with 18 (81.8%) responding that their typical student does this two or more times during class, but spends less than 20 minutes doing so (21, 91.3%). Students estimate that they sometimes/frequently use technology during class for non-academic purposes (127, 61.9%), with 113 (55%) responding they do this two or more times during class, although the majority (188, 91.7%) report spending less than 20 minutes engaged in this behavior. When the students were asked the same question about their typical classmate's use of technology for non-academic purposes in a 50-minute class period, students estimated that their peers do this two or more times during class (169, 82.3%) for more than 20 minutes (80, 38.9%).

There appears to be a lack of agreement between faculty and students regarding the gravity of this issue. Faculty perceived that the vast majority of students used technology for non-

academic purposes and 22 (95.7%) faculty agreed that the use of technology for non-academic purposes during class time is disruptive to student learning. Conversely, slightly less than two-thirds of students self-reported that they regularly use technology during class for non-academic purposes and only a small percentage found this to be distracting. Considering the students' responses, it is intriguing to note that students find their fellow classmates' use of technology during class time more disruptive than their own personal use of technology.

The present study provides both a national perspective as well as a single college-specific assessment. Common themes regarding technology use and misuse were observed between the two surveys; however, there are limitations. One limitation of the national survey is that it was sent only to TiPEL faculty. The experience and perceptions of one faculty member may not be representative of an entire institution. Also, this study was not able to control for the variety of contexts that could impact technology use and policies (e.g. responses from public versus private institutions). A major limitation of this investigation is the fact the college-based survey only provides the perspective at one privately funded college on a state-supported campus, which limits the applicability at dissimilar institutions. Moreover, the college-specific survey only assessed students in the didactic years of the program. Students on advanced pharmacy practice experience may have responded differently. Because the college specific survey was conducted anonymously, student demographic data were not obtained, which prevented evaluation of responses based on various characteristics (e.g., undergraduate work).

Our research has provided a glimpse of what is currently happening in pharmacy education around the country. Some universities are embracing the challenge presented by technology and are incorporating technology-based activities into their courses. However, our study has also uncovered faculty concerns about the negative effects that technology may have in the pharmacy learning environment. Many institutions have imposed policies and procedures in response to evolving technology concerns. Education among both faculty and students is necessary so that all are aware of and understand technology guidelines, but many challenges remain. If technology policies are in place, are they being enforced, and by whom?

Technology is becoming the new norm in education and faculty may need to adjust. Perhaps the answer is that educators must find a balance within their classrooms, knowing where technology can enhance and where it can potentially hinder learning. Although electronic devices may distract student attention, they can also offer the opportunity to create activities that provide more engaged, student-centered learning.

Opportunities to use technology both in and out of the classroom will continue to expand. There are no quantitative or qualitative studies about educational technology that clearly establish the factors necessary for maximum effectiveness or optimal learning outcomes. Future research should evaluate if interventions discussed in this study (e.g. banning of cell phones or laptops) are effective methods to facilitate proper technology use in the classroom setting.

**Summary**

Technology is changing the learning environment, but not without challenges. Our study documents that technology use during class for non-academic purposes is common and the perception by faculty is that it adversely affects learning. Schools and colleges are attempting to manage student use of technologies in the classroom to minimize distractions, while at the same time allowing students to leverage technologies to assist with their learning.

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**Table 1. Selected Faculty Member Responses (National Cross-Sectional Survey)**

| Item | Responses (84 programs) | | | |
|---|---|---|---|---|
| Indicate if you have had significant problems with students using technology for non-academic related activities while in class or at an experiential setting. | Yes | | No | |
| | 51 (60.7%) | | 33 (39.3%) | |
| Indicate if cell phone use is prohibited during class at your institution. | Yes, by institutional policy | Yes, by school or program policy | Sometimes, it is up to the individual instructor | No |
| | 6 (7.1%) | 20 (23.8%) | 51 (60.8%) | 7 (8.3%) |
| Indicate if your institution uses plagiarism checking software. | Yes | | No | |
| | 52 (61.9%) | | 32 (38.1%) | |

**Table 2. Selected Student Responses (Single College of Pharmacy Survey)**

| Domain | Question | Students (N=205) | |
|---|---|---|---|
| Awareness of Policy | I am aware of the College policy regarding "Communication Devices in the Classroom." | Not Aware | Aware |
| | | 123 (59.9%) | 82 (40.1%) |
| Frequency of Use | How often do **you** use technology during class time for non-classroom related activities? | Never/Rarely | Sometimes/Frequently |
| | | 78 (38.1%) | 127 (61.9%) |
| | During a typical 50-minute class period, how much time do **you** spend using technology for non-class related activities? | < 20 Minutes | > 20 Minutes |
| | | 188 (91.7%) | 17 (8.3%) |
| | During a typical 50-minute class period, how much time does **your typical classmate** spend using technology for non-class related activities? | < 20 Minutes | > 20 Minutes |
| | | 125 (61.1%) | 80 (38.9%) |
| | During a typical 50-minute class period, how many times do **you** use technology for non-class related activities? | Once or Less | Twice or Greater |
| | | 92 (45%) | 113 (55%) |
| | During a typical 50-minute class period, how many times does **your typical classmate** use technology for non-class related activities? | Once or Less | Twice or Greater |
| | | 36 (17.7%) | 169 (82.3%) |
| | During a typical week, in how many different courses do **you** use technology for non-class related activities for any amount of time? | Two or Less | Three or Greater |
| | | 81 (39.3%) | 124 (60.7%) |
| | During a typical week, in how many different courses does **your typical classmate** use technology for non-class related activities for any amount of time? | Two or Less | Three or Greater |
| | | 29 (14.3%) | 176 (85.7%) |
| Frequency of Disruption | How often is **your** use of technology for non-class related activities disruptive to **your own** learning? | Never/Rarely | Sometimes/Frequently |
| | | 163 (79.5%) | 42 (20.5%) |
| | How often is **your classmates'** use of technology for non-class related activities disruptive to **your** learning? | Never/Rarely | Sometimes/Frequently |
| | | 142 (69.3%) | 63 (30.7%) |
| | How often is **your** use of technology for non-class related activities disruptive to **your classmates'** learning? | Never/Rarely | Sometimes/Frequently |
| | | 183 (89.1%) | 22 (10.9%) |
| Severity of Disruption | **My** use of technology for non-class related activities is disruptive to **my own** learning. | Disagree/Strongly Disagree | Agree/Strongly Agree |
| | | 172 (84%) | 33 (16%) |
| | **My** use of technology for non-class related activities is disruptive to **my classmates'** learning. | Disagree/Strongly Disagree | Agree/Strongly Agree |
| | | 186 (90.5%) | 19 (9.5%) |
| | **My classmates'** use of technology for non-class related activities is disruptive to **my** learning. | Disagree/Strongly Disagree | Agree/Strongly Agree |
| | | 157 (76.7%) | 48 (23.3%) |

**Table 3. Selected Faculty Member Responses (Single College of Pharmacy Survey)**

| Domain | Question | Faculty Members (N=23) | |
|---|---|---|---|
| Awareness of Policy | I am aware of the College policy regarding "Communication Devices in the Classroom." | Not Aware | Aware |
| | | 8 (34.8%) | 15 (65.2%) |
| Frequency of Use | In your opinion, how often do your students use technology during class time for non-class related activities? | Never/Rarely | Sometimes/Frequently |
| | | 2 (8.7%) | 21 (91.3%) |
| | During a typical 50-minute class period, how much time would you estimate your typical student spends using technology for non-class related activities? | < 20 Minutes | > 20 Minutes |
| | | 21 (91.3%) | 2 (8.7%) |
| | During a typical 50-minute class period, how many times would you estimate your typical student uses technology for non-class related activities? | Once or Less | Twice or Greater |
| | | 5 (18.2%) | 18 (81.8%) |
| Frequency of Disruption | In your opinion, how often is student use of technology for non-class related activities disruptive to **the student's own** learning? | Never/Rarely | Sometimes/Frequently |
| | | 2 (8.7%) | 21 (91.3%) |
| | In your opinion, how often is student use of technology for non-class related activities disruptive to **their classmates'** learning? | Never/Rarely | Sometimes/Frequently |
| | | 4 (17.4%) | 19 (82.6%) |
| Severity of Disruption | Student use of technology for non-class related activities is disruptive to **the student's own** learning. | Disagree/Strongly Disagree | Agree/Strongly Agree |
| | | 1 (4.3%) | 22 (95.7%) |
| | Student use of technology for non-class related activities is disruptive to **their classmates'** learning. | Disagree/Strongly Disagree | Agree/Strongly Agree |
| | | 4 (17.4%) | 19 (82.6%) |

**Figure 1. Single College of Pharmacy Survey**
**Student – Reported Rationale for In-Class Technology Use for Non-Academic Purposes (n = 205)**