Cyberethics: Identifying The Moral, Legal And Social Issues Of Cybertechnology In K-12 Classrooms

David S. Brown, (Email: david-brown@utulsa.edu), University of Tulsa
Tao Wang, (Email: tao-wang@utulsa.edu), University of Tulsa

ABSTRACT

Two computer viruses that have caused hundreds of millions of dollars in damage over the past four years are the Melissa and the Sasser virus. In March of 1999, the Melissa virus first appeared on the Internet and spread rapidly throughout computer systems in the United States and Europe. The virus made its way through 1.2 million computers in the United States alone. On December 9, 1999, David Smith pleaded guilty to state and federal charges associated with his creation of the Melissa virus (Vamosi, 2003). Reasons for writing the viruses; "boredom", "the challenge", and "that's what I'm good at, what I like to do. In May, 2004, the Sasser virus was released by an 18 year old in Germany (Williams, 2004). The arrest made on this "script kiddie" was the first which used Microsoft's $5,000,000 fund, even though millions has been offered for information on other viruses. Unfortunately, young virus creators are unwilling to turn one another in, claiming they write viruses because they have nothing else to do or because they just want to see what happens. The purpose of this paper is threefold. First, this paper will describe the extent of Internet/cyber use by American students. Second, this paper will present data from a resent research project showing the large amount of cyber crimes are secondary students are aware of and are participating in. Finally, this paper will present scenarios which might help the reader understand why ethical choices of today's script kiddies are not as black and white as the reader might think.

Use of the internet has been documented as rapidly growing in ever sector of the economy and every country in the world, especially in education. Although 260 million people were using the internet worldwide in 1999, the number had climbed to 520 million by 2001 with 166 million of those individuals living in the U. S. (Huey, 2002). By 2002, as many as 70 million people in the U. S. were using the internet solely from their homes and almost 70 million people were accessing the internet on a daily basis at work (Powell, 2003). Schools have also been increasing in their numbers of purchased computers for student use and then allowing students access to the internet while at school. In 2001, the U. S. was the leading country in the world to have internet usage by students at school and with the push for computers in every school to be hooked to the web, access by U. S. student internet use alone is increasing in astounding numbers. With more and more schools getting the web, teachers are becoming promoters of web-based activities encouraging to and forcing students to go online. Increasing technology use seems to be a wonderful goal, but online crimes are increasing daily, with teenagers being the ones who are committing the majority of these cyber crimes.

WHO USES THE INTERNET?

In 1999, roughly 260 million people were using the internet world-wide. By the year 2001, that number had jumped to about 520 million, with 166 million of those living in the United States alone (Huey, 2002). By 2002, nearly 70 million people in the U. S. were using the internet from their homes and almost 70 million people were accessing the internet on a daily basis at work (Powell, 2003). Studies have shown that in the U. S., the greatest percent of internet users are teenagers and young adults, with adults 55 or older being the fastest growing segment of the internet community (Berger, 2000). Since 1994, schools have rapidly become connected to the internet, with

35% of U. S. schools connected in 1994, rapidly changing to 96% by the year 1999 (NCES, 2000). In world-wide usage of the internet, in 1999, almost 6 million people were online in China, by 2001 nearly 34 million people in China used the net, and in 2002, it was estimated that within a year, by the beginning of 2003, almost 65 million people would be online (Junning, 2002).

Table 1: Analysis of TIMSS-R data showing internet access at home and at school

|	Rank	Internet Access Mean	at Home SD	Rank	Internet Access Mean	at School SD
USA	1	0.59	0.49	3	0.76	0.43
Canada	2	0.57	0.50	1	0.87	0.33
Singapore	3	0.47	0.50	10	0.48	0.50
Finland	4	0.43	0.50	4	0.75	0.43
Israel	5	0.42	0.49	11	0.47	0.50
Netherlands	6	0.41	0.49	8	0.53	0.50
Australia	7	0.38	0.49	2	0.80	0.40
England	8	0.36	0.48	5	0.65	0.48
New Zealand	10	0.34	0.48	6	0.62	0.49
Hong Kong	9	0.34	0.48	15	0.26	0.44
Taiwan	11	0.32	0.47	7	0.61	0.49
Belgium	13	0.27	0.45	12	0.44	0.50
Cyprus	12	0.27	0.45	26	0.04	0.18
Slovenia	15	0.23	0.42	9	0.49	0.50
Korea	14	0.23	0.42	22	0.06	0.23
Malaysia	16	0.14	0.35	24	0.05	0.22
Japan	18	0.13	0.34	23	0.06	0.23
Italy	17	0.13	0.34	16	0.20	0.40
Tunisia	20	0.08	0.27	29	0.01	0.10
Bulgaria	19	0.08	0.27	21	0.07	0.25
Macedonia	26	0.07	0.25	31	0.01	0.07
Lithuania	25	0.07	0.26	18	0.13	0.34
Jordan	24	0.07	0.25	30	0.01	0.09
Hungary	23	0.07	0.26	13	0.35	0.48
Czech Republic	22	0.07	0.26	17	0.16	0.37
Chile	21	0.07	0.25	19	0.12	0.32
Morocco	27	0.06	0.23	34	0.00	0.05
South Africa	29	0.05	0.22	27	0.04	0.19
Slovak Republic	28	0.05	0.22	25	0.05	0.21
Thailand	34	0.03	0.17	20	0.08	0.28
Russian Federation	33	0.03	0.18	33	0.01	0.11
Romania	32	0.03	0.18	32	0.01	0.11
Moldova	31	0.03	0.17	28	0.02	0.14
Latvia	30	0.03	0.18	14	0.35	0.48
Indonesia	35	0.02	0.13	35	0.00	0.07
International mean		0.20			0.27	
International SD		0.17			0.28	

TIMSS

The TIMSS-R (The Third International Mathematics and Science Study - Repeat) 1999 data is publicly available and was conducted as a follow-up to the 1995 TIMSS in the series of IEA studies to measure trends in students' mathematics and science achievement. The TIMSS-R, conducted by the International Study Center at Boston College, included 38 countries and measured the mathematics and science achievements of eighth-grade student (ages 13 and 14 years) while collecting extensive information from students, teachers, and school principals about mathematics and science curricula, instruction, home contexts, and school characteristics and policies. Of the

38 participating countries, 26 also participated in the 1995 TIMSS assessment which enabled these countries to measure trends in their children's mathematics and science achievement and in schools and home contexts for learning. The next TIMSS assessment will be conducted in 2003.

From the TIMSS-R data (Table 1), released in 2001, the United States was ranked third in the world for the percent of students using the internet at schools and first in the world for students using the internet at home (Brown and Wiseman, 2003).

Computer technology is defined in this paper by the number of computers available for instruction for students and teachers. From the TIMSS data, Figure 1 shows the number of computers schools in the U.S. have available for student use. There were 173 random schools sampled in the U. S.

Figure 1: Histogram showing the number of available computer in USA schools in 1999
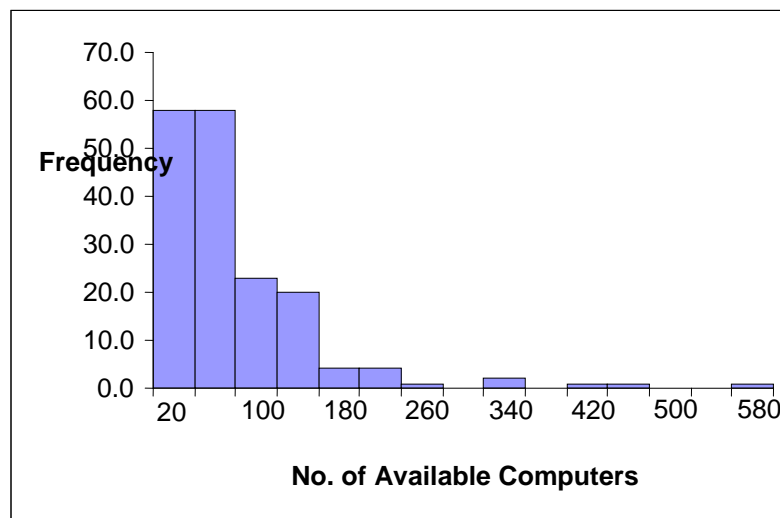
CYBER CRIMES

Crimes committed online are being reported in record numbers every day. Whereas teenagers and college students are most likely to cite downloading of music as the major cyber crime occurring today, industry tends to report back robberies, fraud, illegal use of company time, and intellectual property theft as their biggest fears. Table 3 describes a wide range of reported crimes committed in the past five years. Although some categories are slightly vague and catch all groups, the following is by no means all crimes that are occurring throughout the world, or even in the States. Individuals committing wrongdoings online have been categorized as cyber criminal (those that commit illegal acts) to cyber terrorists (those who seek to cause as much damage as possible) with world-wide efforts to punish those involved in any category (Regan, 1999). Below is a list of obvious cyber crimes. Unfortunately, there are many not-so-obvious crimes.

Table 3: Reported cyber crime since 1998 (Brown, 2003)

Type	Crime
Identity theft	Credit card theft
	Illegal bank account access
	Internet scams
	Impersonating others (mainly children)
Piracy	
	Illegal downloading music
	Copyright laws for books
	Plagiarism
	Illegal downloading DVD's
Invasion of Privacy	
	Reading others emails
	Hacking
	Cracking
	Phone phreaking
	Underground chat rooms for conspiracy
	Conversion of property (CPU theft)
	Child pornography
Economic espionage	
	System penetration from outside the company
	Computer virus
	Overloading a website
	Eavesdropping
	Spying
	Downloading unauthorized data
Employee internet misuse	
	Abusing internet privileges
	Misuse of e-mail

SCENARIOS

Black and white? Right or wrong? Today we are faced with moral dilemmas that are solely relevant to cyber space. We face challenges within our technological era that could never before have been imagined. As adults, we seem to think that any educated adult, or pre-teen for that matter, can determine what is right and what is wrong when faced with any moral scenario. For the reader, here is your chance. Choose what is right and wrong, or plead there is no right or wrong in each situation.

Problem #1: Talking To Strangers

As a parent, we teach our children not to talk to strangers. Why? Because of the statistics that represent reported cases of child abuse, child abduction, child rape, and child sexual assault. The numbers are staggering. Up to 4,600 children reported as missing each year are abducted by non-family members (U. S. Department of Justice). Two-thirds of all babies born to teenage mothers are fathered by adult men, not classmates (Diane Russell Survey, 1996). Nearly 50% of all rape victims are under the age of 18 (Childlures.com). Two-thirds of all sex offenders currently in state prisons are there for raping children (U. S. Department of Justice). What is even more shocking are the numbers of children who talk to strangers each day on live chat rooms. In a recent study, it was reported that 86% of all 8th and 9th grade students who have been online playing interactive games such as Age of Empires, Starcraft, Chess and Neopets (just to name a few) have chatted with strangers during the game, in game chat rooms, or through Instant Messenger (Brown, 2004). These children are "talking to strangers" and are not afraid to or embarrassed to admit it.

Scenario

John, an attorney, used to play a good deal of Bridge while in college with friends. Defined as the "world's most popular card game", Bridge was just the type intellectually stimulating, challenging and complex game John wanted to teach his children at an early age. From the time his girls were 6, each could hold and sort the cards, deal and shuffle, bid their hands, and play the game with reasonable skill. His family found time every month to sit down and create a foursome for Bridge, and several other times each month the girls would play two-handed or three-handed bridge taking turns on which player gets to use the dummy hand with theirs. The game involved mathematics, problem solving, formulating hypotheses, testing hunches and theories, taking risks, failing and succeeding, and, above all, learning how to count on their partner to help them win or attempt to win each hand. Trusting your Bridge partner is the key to being a competitive Bridge player. After three children and many evenings of patience, John had created a family of competitive Bridge players.

In 2002, John purchased a personal computer and began internet access at home. After teaching his children about internet safety, John allowed them to surf the web and play games such as Solitaire and Free cell. Eventually, his daughters convinced him to allow them to join a Bridge room and play bridge against computers and finally against other individuals, similar to themselves, who did not have a foursome at their home anytime they had the desire to play Bridge. Now they could play Bridge at any time, day or evening, weekends, summer months, or over school vacation days.

One afternoon, while Amanda was playing in a live Bridge game online with three other people, Roxanne24, Lizanne101, and CardEater6, she decided to get involved with the chat between players. Although Amanda had never participated in the chats, she had spent months reading what her opponents and Bridge partners were saying. Today, she decided to answer a question. Roxanne24 asked, "Has anyone here ever played Spades before? Lizanne101 answered, "Yes, but I don't remember how." Roxanne24 then said, "That was my real questions. What is the difference between Spades and Bridge?" Amanda, having played Spades with her family before, decided to answer and said, "I have played both. Spades is always trump in the game of Spades, whereas we can choose a trump in Bridge. I like Bridge better." These four individuals played Bridge online for about an hour and each time Amanda responded to questions, she felt more and more comfortable and safe with her Bridge partners. Two of the people eventually had to leave, and Roxanne24 and Amanda decided to be partners when others entered their table to play. For three hours, these two beat most challengers and found they played the game in a similar fashion.

At the end of their last hand together, when everyone in the room said goodbye, Roxanne24 asked if she could add Amanda's screen name to here list of friends, so that she could choose her as a partner again in the future. Amanda agreed, and they logged off. The next day, when Amanda logged on to the Bridge room, Roxanne24 entered the room and said, "Hi Amanda. Remember me, we played Bridge together yesterday. Want to be my partner?" Again they played Bridge, and chatted, for an hour or so, then told each other they would play again soon.

This continued for weeks, and even months. They each played with many different partners, but somehow found each other in the Bridge room. Their conversations went from small talk to political remarks to daydreaming about school, places they would like to travel and music and TV shows. One evening, Roxanne24 confided in Amanda telling her that she was a 14 year old girl who went to a private middle school in Atlanta. Since they had been communicating together for months, kind of like pen-pals, Amanda let her new friend know she was also 14 and lived in Birmingham. They even sent pictures of themselves to each other online. One day, Roxanne24 again confided in Amanda saying she was being abused by her step dad at home and was running away to live with her cousin in Birmingham. She let Amanda help plan the trip, telling her the great places to eat and shop, and even come up with the idea that they should meet for lunch. Amanda chose a mall, and Saturday afternoon, when Amanda's parents went to pick her up from the mall, she was nowhere to be found.

Question 1. As a teacher or a parent, how would you define what a stranger is?
Question 2. At what point in the story did you first get the feeling something bad was going to happen?

Question 3. Should parents ban their children from playing card games, board games, or interactive games online, against live opponents?
Question 4. What rules could be created so children could get online to play games yet be safe from predators?

Problem #2: Script Kiddies

Understanding why a "script kiddie" creates viruses that cause billions of dollars of damage, damaging millions of computers world-wide, is of utmost importance to teachers, parents and our cyber police today. Major viruses, however, are not the only crimes students are committing today. Common crimes committed online by teenagers today include downloading of music, fraud, plagiarism, and property theft (Brown and Wiseman, 2003; Regan, 1999). Other common crimes include impersonating others, reading others emails, hacking, and overloading a website.

Scenario

There is a website that allows individuals to download already created viruses to modify and send under a new name. The web site is www.create-a-virus.htm. One evening, after Johnny has been on the Internet for hours, he gets a phone call and goes to his room to talk to a friend. Johnny's mom goes into their home office to do some web surfing, and notices that Johnny has not logged off. She then goes to the Address menu and scrolls down to see the last few Internet addresses that her son had been visiting. She finds that he has been logged-on to the site which allows one to download and create a virus. She starts looking in recently opened files and finds a virus has been created and stored under a file which her son has left open.

1.   If you were the parent, which of the following would you do?
   a.   Confront your son, even though he will probably be angry that his privacy has been invaded.
   b.   Calls the local cyber police, even though your son might be arrested and put in jail, or even sent off to prison.
   c.   Destroy the virus, although your son could just create another.
   d.   Hiding the fact that you have seen the created virus, sit down with your son and try to find out what he is doing and why he is doing it.
   e.   Hide the fact that you have seen the created virus, and monitor his computer use and try to prevent any crime from being committed.
           Other_____

2.   Ethically, what types of issues are involved with a parent snooping through their child's files? Is this form of invasion of privacy justified?
3.   If the parent does not report the creation of a virus, are they as guilty as their son?

DISCUSSION

It is estimated that there are many more crimes actually being committed by students between the ages of 13 and 19, yet a much larger study will confirm this hypothesis. It was reported in 1997 that more than 20 millions children and teens use internet from their homes (Jupiter Communications, Inc. 1997). With reports from 10 years ago that about 30,000 new users were coming online each day (Mckinney, 1995), it is difficult to estimate how many young people currently log in for the first time today, but it is almost certain that once they find the wonders of the internet at their fingertips, they will continue to use the web more frequently each year. As countries continue to develop more networking capabilities for their populations, and with cyber crimes on the rise world-wide, it is estimated that the crimes students are committed will double in the next several years. The sad part to this story is that many of the criminals are not sure they are committing a crime. Still more are not trying to hurt others, just out for something to do.

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