

Legal and Ethical Issues in Multimedia: A Technical Perspective

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Abstract

In the multimedia environment, where there is a perception that software and intellectual property is free, protection of these assets is a difficult task. Materials produced for on-line learning, multimedia developments and web sites are at the mercy of hackers and other inquisitive computer users. The technological challenge to protect these assets from theft, manipulation and illegal copying is a never-ending battle. Educators play a major role in this protection by informing, discussing and encouraging students to think about these issues from an ethical viewpoint. From a technical standpoint, there is a continual need to search for methods to limit the chance of computer copyright violation, media theft and computer security breaches, especially in an educational facility.

Keywords

Copyright, Education, Ethics, Law, Technical

Introduction

As education is embraced on the World Wide Web with more courses going on-line, educators need to give a thought to the current attitudes of computer users. The mass of information available on the web and the ease of access to this information has led to a new breed of computer user.

McCalman describes the feelings of authors when contemplating electronic publications. 'Why bother to create something if it is to be stolen? ... Why bother if I can't own my own words and have that recognised throughout the world as my original creation? ... Electronic texts can be used in secret by people thousands of kilometres away from their source. Even worse, they can be entered and altered, sabotaged and filched, so that no one may ever know it happened and how.' (McCalman 1995, quoted in Weckert and Adeney 1997 p.57).

The current paper describes some ethical and security issues that are faced by educators and technical staff in an education environment. It presents legal and ethical perceptions of students with regard to copyright issues. This will then be followed by a discussion of technical security safeguards that can be put in place to decrease security problems.

The Law and Intellectual Property

Intellectual property is described by Webber (2000 p.21) as a collective set of exclusive rights which creators can obtain for their works, provided by patents, trade marks, designs, and copyright. Copyright laws (the Copyright Act 1968 (Cth)) cover most intellectual property and software ownership issues, but they are not very effective when applied to groups of computing students. When financial harm is caused to the owner of software, images, electronic works, it is clear why copying this work is "wrong". When subtle alterations are made to images, or portions of works are copied then manipulated, so that it is not easy to recognise the original work, it is more difficult to assess the "wrong". If a change is made to an image that was digitised from a photograph or a picture drawn by someone else, whose property is the new image? (Weckert & Adeney, 1997 p.63). Technically there is little that one can do to protect the intellectual property attached to an original picture, image or work, other than place the owner's name and date on the work.

The Copyright Act 1968 (Cth) protects original expression from unauthorised reproduction or adaptation. The introduction of the Copyright Amendment Act 1984 (Cth) ensured that full protection for computer programs as literary works was provided (Webber 2000 p.22). Unfortunately the protection of computer programs is not the only issue with on-line education. One major current source of piracy involves web sites, which specialise in illegal copies of software. It is estimated that there are 500,000 pages of illegal software on the web (Young 2000). The Business Software Association of Australia (BSAA) estimates lost sales to the Australian software industry amounts to \$280 million each year (Young 2000). Lost sales for local retailers may amount to the same amount again.

Ethics in the Curricula

Many researchers and educators agree that ethics should be integrated into computer courses instead of being attained, through haphazard experience, slowly and inefficiently on the job (Burmeister & Simpson 1999; Gotterbarn 1998; Johnson 1984; Maner 1978; Staehr 1999; Weizenbaum 1976). Grodzinsky & Schulze (1996) found that subject modules on software ownership, hacking, abuse, and security can be introduced in introductory computer courses. As student sophistication develops, natural integration of other ethical topics can be made into more advanced subjects. In her study, Athey (1994) signals to educators that students do not agree about right and wrong behaviour, and agrees that ethics needs to be discussed and debated in the classroom.

In an on-line education situation, the inclusion of a computer policy that covers acceptable use guidelines is a simple addition to a web-site. On-line discussion / chat groups guided by educators are eminently suited to the provision of various scenarios about security, copyright and ethics. Scenarios about the ethics of manipulating images, breaking into computer systems, copying software for various purposes and copying images and other intellectual property abound in literature (DeJoie et al. 1991; Parker et al. 1990; Weckert & Adeney 1997). Short videos or animations, including hypotheticals of ethical and professional behaviour, can be created as an assessment item, then re-used with student permission for further discussion.

Educators and technical administrators have a moral responsibility to encourage students to clarify their understanding of the law and form ethical viewpoints before they enter the workforce. Although employers may have computer ethics policies in place, it is desirable for new computing professionals to have strong ethics and legal training as a precursor.

Student Perceptions of Ethics and the Law

An unpublished study, which gathered data on student perceptions of legal and ethical actions, was conducted by the author in 1998. The survey, completed by 417 students, contained questions about copyright issues including the legality of copying commercial software and ethical perceptions of that action. The students were also asked questions about intellectual property issues including copying information from the internet or from other sources without giving recognition. Results of the responses to the research questions, are shown in Tables 1, 2, 3 and 4.

The students surveyed were from senior high schools (82 students), TAFE (162) and Universities (173) that were geographically situated in North Eastern Australia (Mackay Queensland in the north, to Sydney NSW in the south). All students were studying computing as a major part of their program. Table 1 shows student responses by course to the legality of copying software.

		Current course			Total
		High School	Technical College	University	
Legal perception - Copy Software for education use only	Illegal	49 59.8%	108 66.7%	121 69.9%	278 66.7%
	Legal	18 22.0%	36 22.2%	34 19.7%	88 21.1%
	Neither / Unsure	15 18.3%	18 11.1%	18 10.4%	51 12.2%
Total		82 100.0%	162 100.0%	173 100.0%	417 100.0%

Table 1: Copy Software for educational use by Course

Students were asked to indicate whether they believe an activity to be legal or illegal (Table 1 & 2). In another section of the questionnaire they were asked to indicate their ethical perception of the activity (Tables 2, 3 & 4). The following activities were listed:

- Copy commercial software instead of buying it, then use it for educational purposes.
- Use information from the internet without giving recognition.
- Use information from another source without giving recognition.

There is no significant difference between legal perceptions of students in different sectors (shown in Table 1), although the figures show that high school students are slightly less aware of the legality of copying software for educational use.

		Ethical perception - Copy software for education use only					Total
		Highly Unethical	Unethical	Neither ethical or unethical	Ethical	Highly Ethical	
Legal perception - Copy Software for education use only	Illegal	70 90.9%	84 78.5%	82 53.9%	30 52.6%	12 50.0%	278 66.7%
	Legal	4 5.2%	12 11.2%	45 29.6%	18 31.6%	9 37.5%	88 21.1%
	Neither / Unsure	3 3.9%	11 10.3%	25 16.4%	9 15.8%	3 12.5%	51 12.2%
		77 100.0%	107 100.0%	152 100.0%	57 100.0%	24 100.0%	417 100.0%

Table 2: Legal perception vs Ethical perception - Copy software for educational use

Of the total (417) students surveyed, 88 (21.1%) perceived that copying software for educational use was legal, despite the existence of the Copyright Act 1968 (Cth) and the Copyright Amendment Act 1984 (Cth). Even more disturbing is that 27 of those students felt that it was also ethical or highly ethical to use the software for educational purposes. Responses in Table 2 show that a total of 139 students (33.3%) do not perceive that copying, then using software for education purposes, is illegal. This provides a strong case for further education on aspects of copyright laws. Further evidence of this is apparent in Tables 3 and 4.

Table 2 also highlights a strange phenomenon where a number of students (42 students – 15%) that they believe that copying software is illegal but also perceive that the activity is either ethical or highly ethical. Forcht (cited in DeJoie et al, 1991 p.58) notes this same behaviour and likens the situation to ‘*not fully divulging information for income tax purposes – in some people’s minds, they tend to rationalize that “everyone does it”, thus absolving themselves of personal guilt*’.

		Ethical - Use info from internet without giving recognition					Total
		Highly Unethical	Unethical	Neither ethical or unethical	Ethical	Highly Ethical	
Legal - Use info from internet without giving recognition	Illegal	117 44.2%	94 35.5%	45 17.0%	5 1.9%	4 1.5%	265 100.0%
	Legal	9 12.7%	17 23.9%	21 29.6%	14 19.7%	10 14.1%	71 100.0%
	Neither / Unsure	11 13.8%	27 33.8%	37 46.3%	5 6.3%		80 100.0%
Total		137 32.9%	138 33.2%	103 24.8%	24 5.8%	14 3.4%	416 100.0%

Table 3: Legal vs Ethical - Use information from the Internet with giving recognition

Student perceptions of the legality of copying information from the internet without giving recognition (shown in table 3), can be compared with Table 4 which shows student perceptions of copying information from other sources without giving recognition. Table 4 shows that 74.6% of students perceive copying from other sources as illegal, but only 63.7% perceive copying from the internet (Table 3) as illegal with the remainder of students perceiving that it is either legal or being unsure of the legality of the action.

		Ethical - Use info from another source without giving recognition					Total
		Highly Unethical	Unethical	Neither ethical or unethical	Ethical	Highly Ethical	
Legal - Use info from another source without giving recognition	Illegal	145 87.3%	105 73.9%	47 56.6%	8 47.1%	6 66.7%	311 74.6%
	Legal	8 4.8%	8 5.6%	16 19.3%	6 35.3%	2 22.2%	40 9.6%
	Neither / Unsure	13 7.8%	29 20.4%	20 24.1%	3 17.6%	1 11.1%	66 15.8%
Total		166 100.0%	142 100.0%	83 100.0%	17 100.0%	9 100.0%	417 100.0%

Table 4: Legal vs Ethical - Use information from another source without giving recognition

It can be seen, when comparing Table 3 and Table 4 that the surveyed students do not have as much respect for information that is stored on the

internet. Perhaps ownership of information, which is displayed on the internet and other digital media, is not stated as strongly as that in books and journals.

Other studies have shown similar results to the figures presented in Tables 1 to 4. Athey (1994) found that university students had very poor attitudes toward software copying. Cohen & Cornwell (1989) showed that a significant proportion of university students believed that it was acceptable to pirate software. The results of the study by Chaney & Simon (1994) showed *'only 33% of students surveyed recognized that making copies of business software for personal use is unethical'*. They suggested that *'students might benefit from planned instruction related to ethical computer practices'*.

Technical Safeguards

There are few methods available to technical staff at educational institutions to reduce the incidence of copyright breaches by staff and students. One of the major tools is the availability of a *computer usage policy* for all members of the organisation. All new staff and students should be introduced to the policy to inform them about acceptable use of computers in the organisation, and the measures that can be taken by technical staff to ensure adherence to the usage rules. When a computer usage policy is in place, from a technical perspective, there are then a number of avenues that allow enforcement of the policy.

On initial contact, computer users are given an orientation on use of the computer system. The orientation can apply equally to staff and students. It introduces the user to the login procedure, storage facilities, space limitations, and acceptable usage rules of the organisation. Computer users are familiarised with programs that are used by system administrators to check workstation activity from time-to-time. They are also advised that random file scanning will occur regularly.

A number of software applications allow a system administrator to control security issues on networks. As stated previously it is impossible, from a technical computer aspect, to control the copying and/or manipulation of intellectual property such as literature, images, or even look-and-feel. It is however possible to reduce the incidence of copying of licensed software and to protect students' intellectual property.

The use of a secure network operating system, such as *Novell® Netware Operating System* or *Microsoft® Windows NT®*, or security software for Macintosh computers, such as *Mac Administrator*, allow system administrators to protect software and data, by denying access to computer users. Parts of programs can be hidden from view, to prevent the unauthorised copying of installed software applications. Software which is installed on network servers can be protected by a facility that allows the software to be tagged “copy inhibit”.

Use of “user groups” in *Windows NT®* allows control of various in-built utility programs within the operating system. System administrators can restrict use of tools such as the registry editor, to prevent students from over-riding or disabling security software.

Workstation viewing applications, such as *VNC (Virtual Network Computing)* can be used by system administrators to deter students from performing actions that do not conform with the computer usage policy. Remembering that students are informed about observation by computing staff when first introduced to their studies, students who are suspected of inappropriate computer usage, may have their workstation screen viewed remotely. If a student is found to be using the computer inappropriately, action can be taken ranging from, a simple movement of their mouse pointer by the administrator, to the disabling of their computer account.

User storage space restrictions are imposed for various reasons. Server hard disk space is the primary reason for limitations, but an underlying motive is to restrict space for the storage of illegally down-loaded or copied software. The computer usage policy states that “the storage or use of non-educational software is not permitted”, therefore random file searches in data storage areas, using *.exe or *.img for example, are carried out periodically. *.exe will produce a list of executable programs which may or may not be educational. *.img or *.jpg produces a list of images that can be randomly viewed for inappropriate content.

Finally, where there are no intellectual property issues, students are provided with a common storage area, to enable them to share and swap files and data. For assignment work, where an element of intellectual property exists, a separate secure storage area is provided. Files can be written by all students, but cannot be viewed, altered or deleted by students once data is placed in this area.

Conclusion

Legal and ethical issues in computing are proliferating, especially in the context of the internet. With the number of new computer users increasing daily, it is difficult to inform the general computer user population of copyright issues. It is vital that all educators realise the pervasiveness of computing and take steps to provide acceptable use guidelines for all students in all disciplines, as it is clear, from a technical standpoint, that there is currently little that can be done to protect intellectual property.

It has been shown that the majority of students, in this study, are aware of copyright issues and they perceive relationships between illegal and unethical issues. There is concern for the remaining 33% of students who are unsure of their legal and ethical responsibilities. Therefore educational institutions face a huge challenge to find ways to protect intellectual property contained in on-line materials, multimedia developments and web sites.

It has been argued that educators and administrators have a moral responsibility to encourage students to think about their legal and ethical obligations to prepare them for employment as computing professionals.

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