

A PROFILE OF THE DISTANCE COMPUTING STUDENT SOFTLIFTER

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ABSTRACT

The use of software in violation of applicable licensing agreements and copyright laws are reaching endemic proportions. One population cluster strongly linked to illegal software acts is the university student. While some research is available on patterns of illegal software use for non-monetary gain (softlifting) under residential student populations, a dearth of information exists on student populations at distance institutions.

On face value, a distance institution offers a unique environment in which to study factors known to contribute to student softlifting behaviour under residential student populations. For example, whereas residential students offer the cost of software and their lack of income as one reason they softlift, the distance student is more likely to work full-time and study part-time, thereby earning an income. Moreover, whereas the younger residential student falls in age groups typically associated with softlifting activities, the distance student body is representative of all age groups and one would expect the older student to be less tolerant of softlifting. The distance student body is also drawn from across communities and cultures. Distance students also do not generally have contact with fellow students, an important source of softlifted applications. The distance computing student, in particular, is also likely to be employed in a computer-related field and is therefore expected to be more computer experienced than other students, another oft important factor strongly associated with softlifting.

From a literature survey, several parameters thought to contribute towards the establishment of a profile of the distance computing student softlifter (DCSS) were identified and grouped into four categories, namely demography, motivation for use, sources and usage patterns. A base population of computing students was requested to complete an on-line questionnaire, and 226 students responded. The current study is an attempt to validate the identified parameters as profile predictors of the DCSS, and to present a profile of the DCSS.

KEY WORDS

Softlifting; computing students; distance education; profile.

1 INTRODUCTION AND LITERATURE REVIEW

Despite a myriad new legislation and incessant efforts by associations of and software producers themselves, the prevalence and incidences of the use of software in violation of applicable licensing agreements and copyright laws are reaching endemic proportions. In 2001, the Business Software Alliance (BSA) Annual Global Piracy Study for 2000 reported, for the first time in the study's history, a worldwide percentage increase in illegal software use (BSA, 2001). This trend continued for 2002, with a marked increase from 37% to 40% (BSA, 2003), stabilizing somewhat in 2003 at 36% (BSA, 2004).

Concurrently, there has been an increase in research efforts into the field of illegal software use, be it software piracy (for monetary gain), or softlifting (no monetary gain for the user). The majority of research efforts can loosely be categorized into two major areas of study – those that aim to understand, describe and model patterns of illegal software use and those that focus on preventative and deterrent controls.

Research on patterns of softlifting has generally focused on incidences of and attitudes towards illegal software use by distinct population segments, such as company employees (Calvo, 1991; Lending & Slaughter, 1999), university students and academia (Solomon & O'Brien, 1990; Hancey & Kingsbury, 1994; Sims, Cheng and Teegen, 1997; Limayyem, Khalifa, Chin, 1999; Chiang & Assane, 2002).

One population cluster strongly linked to acts of softlifting is the university student. As Chaing and Assane (2002) noted, university students possess a number of characteristics that make them more likely to resort to softlifting. Firstly, there is a high demand for software among students. Secondly, with lower disposable incomes students cannot afford software, and thirdly, they tend to have the knowledge and access to infringe. Finally, they also possess a perceived low risk of apprehension and conviction.

Several empirical studies on softlifting patterns under university students have been undertaken over the last decade or so. Some of the more visible studies include Johnson (1988), Wong, Kong & Ngai (1990), Kowalski & Kowalski (1990), Solomon & O'Brien (1990), Swinyard, Rinne & Kau (1990), Eining & Christensen (1991), Simpson, Banerjee & Simpson (1994), Sims, Cheng & Teegen (1997), Ang & Lo (1998) and Chaing & Assane (2002).

Factors motivating softlifting identified in these and other research efforts (Al Jabri and Abdul Gader, 1997; Harrington, 1996; Pierce and Henry, 1996; Banarjee, Cronan and Jones, 1998; Limayem, Khalifa and Chin, 1999) include, inter alia, age, gender, history, culture, ecology, social situation and social factors, perceived consequences, habit, intentions, facilitating conditions, ethnicity, computer experience, computer ownership, absence of penalties, availability of software to pirate, the absence of a code of ethics, organizational ethical climate and disposable income.

Some of the results have been contradictory. For example, while Davis & Welton (1991) and Wong et al. (1990) found no significant gender difference, Simpson et al (1994) and Sims et al (1997) did report significant gender findings. Conversely, whereas Sims et al (1997) and Husted (2000) reported a relationship between disposable income and softlifting, Wong et al (1990) and Solomon and O'Brien (1990) did not find any evidence. Seemingly there exists, at different times on different campuses and under different groups of students several diverse reasons as to why students softlift. For example, a factor that has only recently begun to receive formal research attention but has not yet been investigated on campuses is illegal online software distribution. With the rapid development of the World Wide Web (WWW), the ease of unauthorized distribution of files across the Internet has become a thorn in the side of many software firms. Aside from notorious "warez" sites that offer illegal copies of most software applications for download, many software companies involuntarily contribute to softlifting by offering downloadable trial versions.

With many “security” search engines available on the Internet, it generally takes less than a minute to find a serial number, or a keymaker (a small application that generates serial numbers), or a patch to re-engineer the trial version’s application executable. Hinduja (2003) rightly states that softlifting using the Internet poses a significant threat to the well-being of businesses and individuals and Holleyman (2000) predicted that illegal online software distribution will become an even bigger problem in the future.

Most of the studies referred to here above focused on specific student populations. Rahim, Seval & Rahman (1999), for example, explored softlifting amongst computing students, Al-Jabri & Abdul-Gader (1997) investigated engineering, business and computing students while Solomon & O’Brien (1990) probed business students.

Of these populations, computing students are distinctive for various reasons. As Rahim, Seval & Rahman (1999) argued, softlifting use patterns under computing students could be expected to be different to that of “ordinary” students, since they (computing students) have the skills, opportunity and expertise to softlift. Nearly 64 % of computing students they investigated were found to use pirated software, a figure higher than those reported in studies of general student populations.

Clearly then, many approaches to the study of factors and patterns of softlifting under college students are available. Against this background, the current study attempts to compile a profile of the Computer Studies student softlifter at a prominent distance education institution situated in South Africa with an international student body.

Compared to a residential institution, a distance education institution presents a unique environment in which to study softlifting, for various reasons. Firstly, the distance student body is representative of all age groups. All the studies reviewed and referred to earlier focused on younger, residential student populations. Secondly, the distance student body transcends all cultures and communities. Simpson Banerjee & Simpson (1994) suggests that personal, socio-cultural and situational factors all influence the ethical decision process (to softlift or not). Thirdly, the majority of distance students are expected to work full-time and study part-time, hence their decision to study at a distance institution. Since there is evidence that lower income students are more likely to softlift (Sims et al, 1997), the distance education student who is likely to be employed earning a salary is therefore less likely to softlift. Finally, the distance computing student is also likely to be employed in a computer-related field, and “should” be more sensitive and understanding to the effects of softlifting – after all, it could affect their own income. Conversely, since computer experience has been recognized as a contributing factor in softlifting (Wong et al 1990; Rahim et al 1999), the distance computing student is perhaps more likely to softlift than the distance student in non-computing faculties.

2 RESEARCH APPROACH

In order to develop a profile of the distance computing student softlifter (DCSS), sixteen latent parameters were identified, some from a literature review on softlifting and others from an exploratory pilot study which had as an additional purpose the identification of potential parameters.

The proposed parameters are presented in *Table 1*. Four categories of parameters are proposed, namely Demography, Motivation for Use, Sources, and Usage Patterns.

The following *demographic parameters* are proposed to contribute towards establishing a profile for the DCSS: Age Group, Gender, Work Status and Disposable Income, Computer Experience and Employed in a Computer-related Field. Illegal software *source parameters* are proposed to include Friends, the World Wide Web (WWW) and Counter Copies. *Motivation for use parameters* are presumed to be a complex interaction between Ethical Viewpoint, Reasons for Use and Understanding the Implications of softlifting. Finally, *usage patterns parameters*, in particular

Types of Applications, Number of Applications and Rate of Usage, will assist in profiling the DCSS.

Associated alternative hypotheses (H1-10), proposed in the next section, appear in 3rd column. Some parameters are applicable only to the DCSS, hence descriptive analysis (DA) techniques are employed to investigate and return results.

Table 1 Profile Parameters for the Distance Computing Student Softlifter (DCSS)

CATEGORY	PARAMETERS	HYPOTHESIS/ DESCRIPTIVE ANALYSIS
Demography	<ul style="list-style-type: none"> ▪ Age group ▪ Gender ▪ Work Status & Disposable income ▪ Computer Experience ▪ Employed in a Computer-related Field 	<ul style="list-style-type: none"> ▪ H1 ▪ H2 ▪ H3 & H4 ▪ H5 ▪ H6
Motivation for use	<ul style="list-style-type: none"> ▪ Ethical Viewpoint ▪ Understanding the Implications ▪ Reasons for Softlifting 	<ul style="list-style-type: none"> ▪ H7 ▪ H8 ▪ DA
Sources	<ul style="list-style-type: none"> ▪ Having Friends Who Softlift ▪ Having Three or More Friends Who Softlift ▪ World Wide Web ▪ Counter Copies 	<ul style="list-style-type: none"> ▪ H9 ▪ H10 ▪ DA ▪ DA
Usage Patterns	<ul style="list-style-type: none"> ▪ Types of Applications ▪ Number of Applications ▪ Rate of Usage 	<ul style="list-style-type: none"> ▪ DA ▪ DA ▪ DA

Key: H = Alternative Hypothesis #; DA = Descriptive Analysis

The main purpose of this study is to validate these parameters as predictors of the profile of the DCSS.

Secondary research questions are represented by the categories defined in Table 1. They can be stated as follows:

1. *What demographic parameters are related to the DCSS?*
2. *What motivates the DCSS to softlift?*
3. *What are the DCSS's major sources of softlifted software?*
4. *To what extent does the DCSS softlift?*

Students were also allowed to post their own comments on softlifting at the end of the questionnaire. It was hoped that these comments will provided further insight into some of the parameters. These comments are reproduced in Appendix A in unedited (except for grammar) format.

3 PAST STUDIES AND DEVELOPMENT OF RESEARCH HYPOTHESES

In order to validate the identified profile parameters as predictors of the profile of the DCSS, several hypotheses based on the research model are forwarded in the next sections. A brief review of prior research on the parameters is also provided.

The null hypotheses applicable to each aspect discussed below *always* assumes no dependency between the type of user (softlifter or not) and the relevant aspect (such as age) addressed in a specific section.

3.1 Age parameter

There appears to be no information available on specific age groups as a predictor of softlifting. However, students in studies at residential level ordinarily rank in the age group 18-24 years. Kini Rominger and Vijayaraman (2000) reported a less moral attitude towards softlifting by younger people. Nyaw en Ng (1994), in a four-country study, found older respondents to be less tolerant of

unethical behavior such as softlifting than younger ones. Since students in the present study represent all age groups, the following alternative hypothesis and comment is postulated:

H1_a: A relationship exists between age and type of user. More specifically, younger distance computing students are more likely to softlift than older distance computing students.

3.2 Gender parameter

Davis & Welton (1991) found no significant gender difference under softlifters, as did Wong et al (1990). Simpson et al (1994) and Sims et al (1997), however, did report gender to be a significant factor. Rahim et al (1999) argued that males are perhaps more willing and curious to softlift. Wong (1985), Simpson, Banerjee & Simpson (1994) and Sims et al (1997) all reported male students to pirate more often than females. The following alternative hypothesis and comment is forwarded:

H2_a: A relationship exists between age and type of user. We expect to find male distance computing students to be more likely to softlift than female distance computing students.

3.3 Work Status and Disposable Income parameters

Since it is in the nature of a distance institution to have a student body largely made up of full-time working part-time studying students, and given strict workplace regulations on illegal software use, distance computing students may not equal the demand for softlifted applications displayed by residential students. The alternative hypothesis and comment is:

H3_a: A relationship exists between work status and type of user. In particular, part-time distance computing students are less likely to softlift than full-time distance computing students.

Work status, of course, also implies a higher disposable income than the residential student. While *some studies (Wong et al, 1990 and Solomon & O'Brien, 1990) found no relationship between* disposable income and softlifting, there is evidence that lower income students are more likely to softlift (Sims et al, 1997; Husted, 2000). The following alternative hypothesis and comment is drawn:

H4_a: A relationship exists between disposable income and type of user. Distance computing students with a higher disposable income is expected to softlift less than distance computing students with a lower disposable income.

3.4 Computer Experience parameter

Wong et al (1990) and Rahim et al (1999) found softlifting to be greater amongst computer experienced students who own a personal computer. Since ownership of a PC is a requirement for students in the faculty and since the majority of degree modules offered is computer usage intensive, the current population is also expected to be comparatively more computer experienced than the average residential student. Moreover, since the majority of students are also likely to be employed in a computer-related field, they are projected to be even more computer literate than the average residential computing and non-computing student, as well as the distance non-computing student. The following alternative hypothesis and comment is postulated:

H5_a: A relationship exists between computer experience and type of user. We postulate that the more personal computer experience distance computing students have, the more likely they are to softlift.

3.5 Employed in a Computer-related Field parameter

In the context of a distance institution and computing students who are likely to be employed in a computer-related field, this parameter has added significance over and above the computer experience they are thought to acquire on a daily basis. Students who work in a computer-related field are expected to be more appreciative of not only the effort it takes to release software, but also of the company revenue that is lost as a result of softlifting – income that ultimately affects their

potential remuneration packages. It follows that they should be less inclined to and tolerant of softlifting. The following alternative hypothesis and comment is offered:

H6_a: A relationship exists between employment in a computer-related field and type of user. We expect to find that distance computing students who are employed in a computer-related field are less likely to softlift than full-time distance computing students who are not.

3.6 Ethical Viewpoint parameter

Cohen & Cornwell (1989) and Glass & Wood (1996) found that college students do not view software piracy unfavourably or unethical. Nyaw & Ng in a four country study (1994), reported older people to be less tolerant of softlifting than younger people. Limayem, Khalifa & Chin (1999), in a longitudinal study on factors motivating softlifting, suggests that even if individuals view softlifting as wrong and unethical, they might still intend or expect to softlift. Shore et al (2001) and Kowlaski & Kowalski (1990) did not find any overwhelming evidence that ethical behaviour increases with computer experience. The following alternative hypothesis and comment is forwarded:

H7_a: A relationship exists between ethical viewpoint on softlifting and type of user. The majority of distance computing student softlifters will not view softlifting as unethical, while distance computing students who do no softlift will.

3.7 Understanding the Implications parameter

A dearth of research exists on softlifters and their knowledge of the implications of softlifting. Softlifting, however, has several well-known effects on software development and associated processes. These include infringing copyright law, civil or criminal prosecution, negative media exposure for a company, no assurance of quality or reliability, no technical support, exposure to threat of viruses, no warranty on products, pay more for upgrades, government revenue is lost and one job less is created. It is assumed that the more computing students know about the implications of softlifting, the less likely they are to softlift, even if they acknowledge softlifting to be wrong. The following alternative hypothesis and comment is presented:

H8_a: A relationship exists between understanding the implications of softlifting and type of user. In particular, distance computing students who have less knowledge of the implications of softlifting are more likely to softlift than those who do.

3.8 Reasons for Softlifting parameter

This parameter does not make use of statistical inferences other than descriptive analysis to compile the profile. Results from the survey will be presented in tabular format and hypotheses are not forwarded.

Little information on the reasons why students' softlift is available. Soon and Ann (2000) in a survey of 228 undergraduate students reported that the bigger the influence of friends using softlifted software the more likely their respondents were to follow suit. In a pilot study to the current study, student softlifters were afforded space to provide their own comments on why they softlifting. Understandably, they used this opportunity to "justify" their softlifting endeavours. When these comments were reviewed, persistent reasons for softlifting were extracted. These are: software companies make enough money, student want to test software before buying it, software should be freely available (i.e. open source movement), it is too easily done, therefore it is not a crime, student copied a legal version therefore it is not viewed as illegal, student only use it for personal or educational use, it is only illegal if student get caught, everyone is doing it, so why should he/she pay for it, one is allowed to make a backup in case something happens to it, so it must be okay to use it on another machine, student didn't copy it - a friend gave it to him/her, and trial versions don't allow me enough time to evaluate a product.

Anecdotal evidence from chat rooms and Internet sites, however, suggests that cost of software is the major reason for softlifting.

3.9 Sources parameters

Sims et al (1997) found having student friends who copy software to be a top reason for pirating software. Solomon & O'Brien (1990) reported that 71% of their sample permitted others to copy software from them. The current student population is geographically dispersed and thus friends, as opposed to fellow students, are expected to present a major source of softlifted software. The following alternative hypothesis and comment is forwarded:

H9_a: A relationship exists between having friends who softlift and type of user. Distance computing students who have friends who softlift are expected to be more likely to softlift than to distance computing students who do not have friends who softlift.

In addition, the more friends a student have who softlift, the more likely it is that he/she will softlift as more friends means more sources and a bigger variety of applications. The alternative hypothesis and comment is:

H10_a: A relationship exists between number of friends who softlift and type of user. Distance computing students who have more than 3 friends who softlift are more likely to use illegal software than distance computing students who do not have more than 3 friends who softlift.

As detailed in the introduction, the WWW is set to become the major source of illegal software in the next few years. A recent survey by the BSA (2002) found that less than half of the 1026 U.S. Internet users who participated said they regularly pay for the commercial software they download. From the registered student access logs on a departmental server, it is apparent that a significant proportion of the current student population has access to the Internet. The current study also made use of an online-questionnaire to survey students, thus they are known to have access to the Internet, and therefore access to WWW sources. Before writeable CD-Rom drives became standard and affordable, counter copies were the major source of softlifted applications, although it is not expected to be a major source anymore. No hypotheses are forwarded for this and the parameters following.

3.10 Types of Applications parameter

Rahim et al (1999) found entertainment applications to top the list of most popular softlifted application. The assumption here is that DCSS, given his/her older age, higher levels of personal computer experience and work status, is more likely to softlift a variety of applications to coincide with his/her status as a part-time student.

3.11 Number of Applications and Rate of Usage parameter

Following on the above it is expected that the DCSS will have great number of softlifted applications in his/her possession, and will make continuous use of these applications.

The remainder of this paper is arranged as follows. In the next section, the research approach is described. Thereafter statistical results will be presented in tabular format and discussed, before conclusions are drawn and a profile of the DCSS is forwarded.

4 RESEARCH APPROACH

4.1 Questionnaire design

After a review of literature an on-line questionnaire was designed using the open-source software package phpESP version 1.5 (<http://phpesp.sourceforge.net>). The questionnaire was reviewed and tested by a colleague for readability and understanding. It consisted of radio- and checkbox-type questions. The questionnaire was then applied in a pilot convenience sampling study (n=136) which led to the modification of some questions and the addition of others. In both pilot and formal

questionnaires, students were provided with the opportunity to add their own viewpoints on softlifting. Since students are geographically spread, an on-line questionnaire was the obvious method of data gathering employed. Both the pilot and formal questionnaire were completed anonymously over the Internet over a period of 16 weeks in 2002 and 2003 respectively.

4.2 Population

The total number of students registered in the School of Computing at the time of the formal study in 2003 was 13481, of which 37,9 % were female. The base population consisted of a sample frame of 1200 out of 2279 students who have posted or responded to topics on the department's on-line discussion forums. This approach ensured that students would be comfortable with the on-line questionnaire, as use of the forums requires a high level of on-line interaction. Students have to register in order to participate in these forums, and 1200 e-mail addresses were randomly extracted from the user database. These students were requested via e-mail to complete the on-line questionnaire. Two-hundred-and-forty-six (246) e-mails were undeliverable, decreasing the base population to 954. Two-hundred-and-twenty-six (226) students completed the questionnaire, returning a response rate of 24%. All are engaged in either a Computing Studies degree module (86,6%) or in a short course (certificate course) offered by the School of Computing. Seventy-nine percent (79.9%) of the respondents were citizens of South Africa, the rest (21.1%) from foreign countries.

4.3 Analysis of results

The statistical package SAS/STAT (SAS Institute, 1999) was used for statistical analysis of the data. Descriptive analysis, tabulations and non-parametric statistical analysis are used to report the survey results.

5 RESULTS

Of the 226 surveys completed, 120 (53%) students admitted to softlifting. This fairly even spread of respondents gave the impression that both softlifters and non-softlifters felt compelled to respond and justify their use/non-use of illegal software.

A Chi-square statistics of $\chi^2=0.9432$, $df=1$, $p\text{-value}=0,3315$ obtained for type of user (softlift or non-softlifter) and country of origin (South Africa or international) revealed type of user and culture to be independent from one another.

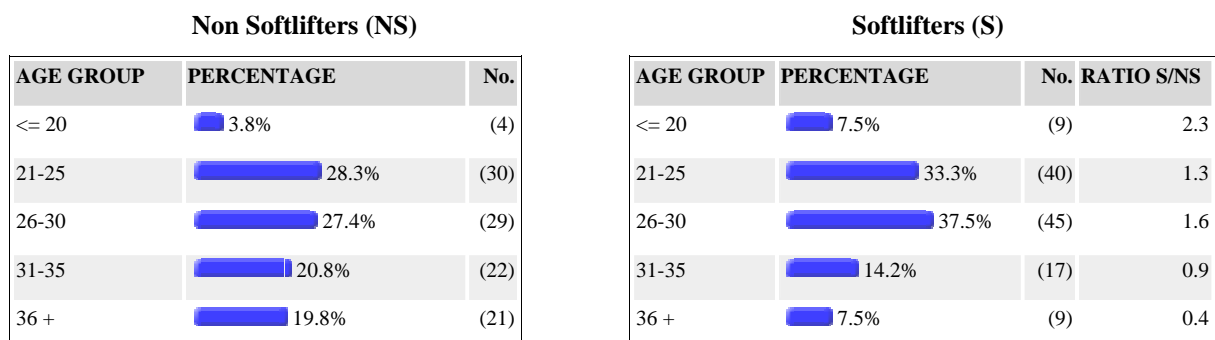
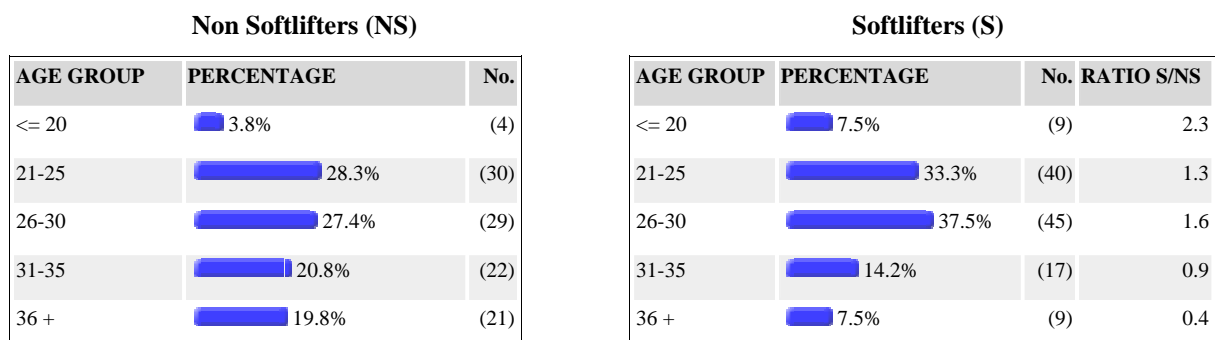
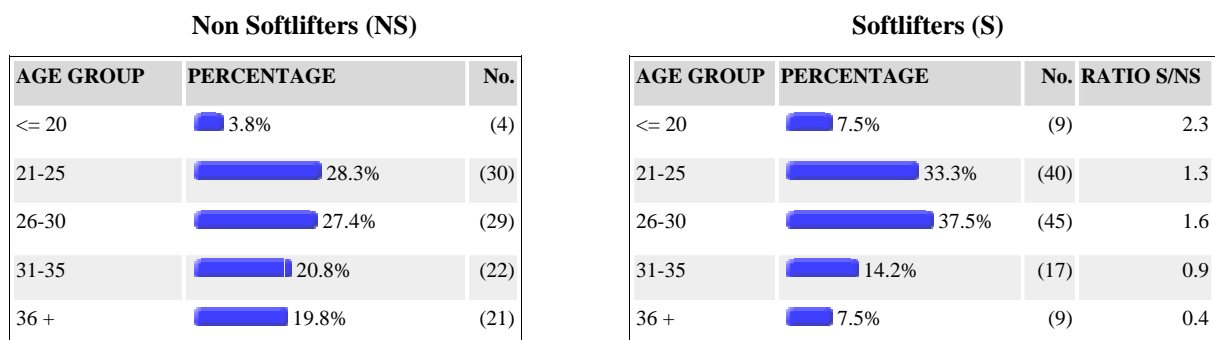
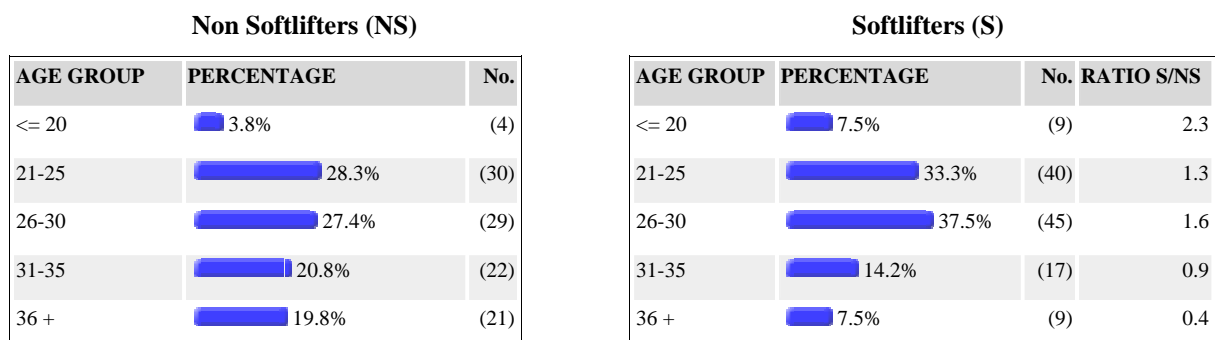
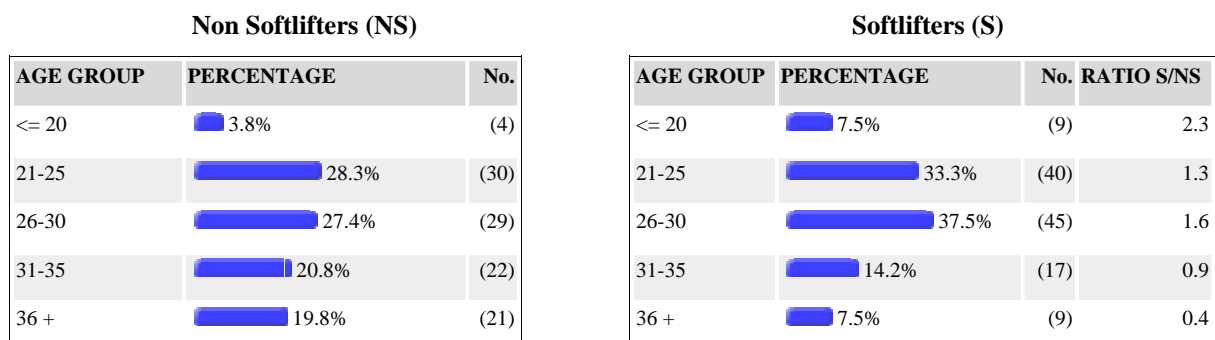
Results on the parameters investigated are presented and then discussed in the order they appeared in *Table 1*.


5.1 Demographic Profile


In order to establish the demographic profile of the DCSS, the following parameters were investigated: Age Group, Gender, Work Status & Disposable Income, Computer Experience and Employed in a Computer-related Field.

5.1.1 Age

Table 2 (a) Demographic profile (Age Group)

Non Softlifters (NS)			Softlifters (S)		
AGE GROUP	PERCENTAGE	No.	AGE GROUP	PERCENTAGE	No. RATIO S/NS
<= 20	 3.8%	(4)	<= 20	7.5%	(9) 2.3
21-25	 28.3%	(30)	21-25	33.3%	(40) 1.3
26-30	 27.4%	(29)	26-30	37.5%	(45) 1.6
31-35	 20.8%	(22)	31-35	14.2%	(17) 0.9
36 +	 19.8%	(21)	36 +	7.5%	(9) 0.4

TOTAL		100.0%	106
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TOTAL		100.0%	120
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From Table 2 (a) it is evident that the majority of respondents fell in age groups 21-30, with 70.8% of softlifters falling into the age groups 21-25 (33.3%) and 26-30 (37,5%). In order to validate age as a predictor, a Chi-square test was performed on the data. The result ($\chi^2=11.4287$, $df=4$, p -value=0,0221 < 0.05) was significant. The null hypothesis of no relationship between age and softlifting is thus rejected in favour of the alternative hypothesis that there is a relationship between type of user and age group. A definite trend was noticeable - the ratio between types of user decreased with an increase in age. Specifically, younger distance computing students softlift more than older distance computing students, with a ratio of 230 softlifters for every 100 non-softlifters in the age group younger than 20, decreasing to 40 softlifters for every 100 non-softlifters in the age group 36+. The Cochran-Armitage Trend Test was employed to investigate this trend. The result ($p<0.01$) was significant.

5.1.2 Gender

Table 2 (b) Demographic profile (Gender)















Non Softlifters			Softlifters		
GENDER	PERCENTAGE	No.	GENDER	PERCENTAGE	No.
Male	 60.4%	(64)	Male	 84.2%	(101)
Female	 39.6%	(42)	Female	 15.8%	(19)
TOTAL	 100.0%	106	TOTAL	 100.0%	120

Table 2 (b) shows 73% of the respondents to be male. Sixty-one percent (61%) of males admitted to softlifting, with 84,2% of softlifters being male and 15% being female. For non-softlifters the spread between male and female was less with 39.6% of non-softlifters female. A Chi-square test value ($\chi^2=16.1639$, $df=1$, p -value=0,0001 < 0,05) was significant. The alternative hypothesis of a relationship between gender and softlifting is accepted. Being a 2x2 table, results could also be confirmed with Fisher's Exact Test ($p=0,00004957$). The results confirmed H2 *male distance computing students are more likely to softlift than female distance computing students*.

5.1.3 Work Status & Disposable Income

Table 2 (c) Demographic profile (Work Status)

Non Softlifters (NS)			Softlifters (S)			
WORK STATUS	PERCENTAGE	No.	WORK STATUS	PERCENTAGE	No.	RATIO S/NS
Work full-time and study part-time?	 79.2%	(84)	Work full-time and study part-time?	 85.8%	(103)	1.2
Study full-time and work part-time?	 6.6%	(7)	Study full-time and work part-time?	 5.8%	(7)	1
Study full-time?	 12.3%	(13)	Study full-time?	 8.3%	(10)	0.8
TOTAL	 98.1%	104	TOTAL	 100.0%	120	

As alluded to in the research approach to this paper, Table 2(c) confirms the majority (83%) of students to be employed full-time. Of the students who admitted to softlifting, 85.8% were working full-time. The ratio of softlifting between the two groups, however, do not differ significantly ($\chi^2=1.1850$, $df=2$, p -value=0,5530 > 0,05). The alternative hypothesis H3 *part-time distance*

computing students are less likely to softlift than full-time distance computing students is thus rejected in favour of the null hypothesis, that is, work status and type of user is unrelated.

Table 2 (d) Demographic profile (Income)

Non Softlifters			Softlifters		
INCOME (R)*	PERCENTAGE	No.	INCOME (R)*	PERCENTAGE	No.
Less than a 1000,00	16.0%	(17)	Less than a 1000,00	14.2%	(17)
1000,00 - 1999,00	4.7%	(5)	1000,00 - 1999,00	3.3%	(4)
2000,00 to 4999,99	13.2%	(14)	2000,00 to 4999,99	15.8%	(19)
5000,00 to 9999,99	14.2%	(15)	5000,00 to 9999,99	15.0%	(18)
10 000,00 to 14 999,00	17.0%	(18)	10 000,00 to 14 999,00	21.7%	(26)
15 000 or more	33.0%	(35)	15 000 or more	29.2%	(35)
TOTAL	98.1%	104	TOTAL	99.2%	119

* \$1.00 = more or less R6.20

Table 2 (d) reflects disposable income of distance computing students in South African Rands (\$1,00 = R6,20). Nearly a third (29.2%) of softlifters have a disposable income of more than R15 000,00 (\$2419.00) per month, positioning them towards the higher-middle economic class. The Chi-square test value ($\chi^2=0.9019$ df=5, p -value=0,9019 > 0,05), however, was not significant, indicating type of user and income to be independent. The Cochran-Armitage Trend Test ($p=0,91$ > 0.01) confirmed this independence. H4 *distance computing students with a higher disposable income are less likely to softlift than distance computing students with a lower disposable income* is thus rejected in favour of the null hypothesis of no dependence.

5.1.4 Computer Experience.

Table 2 (e) Demographic profile (Computer Experience)

Non Softlifters (NS)			Softlifters (S)			
EXPERIENCE	PERCENTAGE	No.	EXPERIENCE	PERCENTAGE	No.	RATIO S/NS
0-2 years	25.5%	(27)	0-2 years	10.8%	(13)	0.5
3-4 years	20.8%	(22)	3-4 years	11.7%	(14)	0.6
5-6 years	17.9%	(19)	5-6 years	24.2%	(29)	1.5
7-8 years	8.5%	(9)	7-8 years	18.3%	(22)	2.4
9-10 years	2.8%	(3)	9-10 years	5.0%	(6)	2.0
10 years +	24.5%	(26)	10 years +	30.0%	(36)	1.4
TOTAL	100.0%	106	TOTAL	100.0%	120	

Tables 2 (e) shows 89.2% of softlifters to have computer experience of 3 years and more. The 10 years plus category provided the highest percentage (30%) of all categories, with the 5-6 years category next highest. The Chi-square test value ($\chi^2=16.0198$ df=5, p -value=0,0068 > 0,05) was significant, indicating a relationship to exist between years experience and softlifting or not. The ratio between types of user increases with an increase in age (from 0.48 for category 0-2 years to

1.38 for category 10+ years). The one-sided Cochran-Armitage Trend Test was employed to investigate this trend. The result (one-sided $p=0,0024 < 0.01$) was significant, confirming that with more experience, the ratio softlifter versus non-softlifter increases. H5 *the more personal computer experience distance computing students have, the more likely they are to softlift* is thus accepted.

5.1.5 Employed in a Computer-related Field

Table 2 (f) Motivation for use profile (employed in a computer-related field)

Non Softlifters			Softlifters		
IT-FIELD	PERCENTAGE	No.	IT-FIELD	PERCENTAGE	No.
Yes	75.5%	(80)	Yes	79.2%	(95)
No	18.9%	(20)	No	16.7%	(20)
TOTAL	94.3%	106	TOTAL	95.8%	120

From Table 2 (f) it is evident that as expected, the majority of distance computing students, regardless their softlift status, are indeed employed in a computer-related field. An equal number of softlifters and non-softlifters are employed in a computer-related field. The Chi-square value ($\chi^2=0.2404$ $df=1$, p -value= $0,6239$), however, was not significant, indicating that whether a student is employed in the IT-field or not does not affect whether he/she softlift or not. H6, *distance computing students who are employed in a computer-related field are less likely to softlift than full-time distance computing students who are not* is thus rejected in favour of the null hypothesis of no dependency.

5.2 Motivation for Use

Motivation for use parameters investigated were Ethical Viewpoint, Reasons for Use and Understanding the Implications of Softlifting.

5.2.1 Ethical Viewpoint

Table 3 (a) Ethical Viewpoint

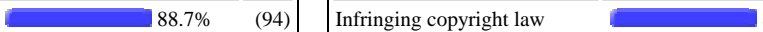

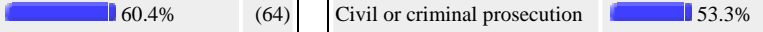

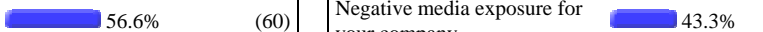

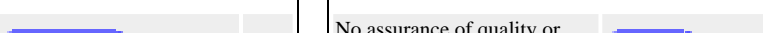

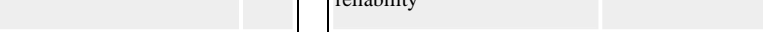
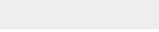


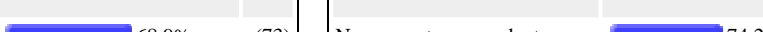
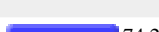
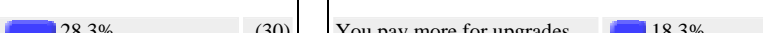


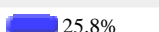
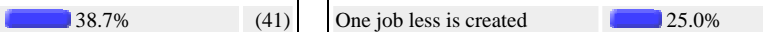

Non Softlifters (NS)			Softlifters (S)		
STANDPOINT	PERCENTAGE	No	STANDPOINT	PERCENTAGE	No. RATIO S/NS
Softlifting is Wrong	60.4%	(64)	Softlifting is Wrong	49.2%	(59) 0.92
Softlifting is Not wrong	4.7%	(5)	Softlifting is Not wrong	8.3%	(10) 2.0
Softlifting is Sometimes wrong	34.9%	(37)	Softlifting is Sometimes wrong	42.5%	(51) 1.38
TOTAL	100.0%	106	TOTAL	100.0%	120

Table 3 (a) reflects the ethical viewpoint taken by students on softlifting. While the majority of students in both groups agree with the viewpoint that softlifting is wrong, large percentages (34.9% and 42.5%) held the view that there are times when illegal use is justified. The Chi-square test value ($\chi^2=3.242$ $df=2$, p -value= $0,1977$), however, did not support the existence of a relationship between type of user and ethical viewpoint. H7 *distance computing students who softlift have a less moral viewpoint of softlifting than distance computing students who do no softlift* is thus rejected. A one-

sided Cochran-Armitage Trend Test ($p=0,0016 < 0.05$), however, proved significant indicating a tendency for softlifters to be “less ethical” in their viewpoints on softlifting.

5.2.2 Understanding the Implications of Softlifting



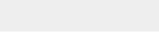
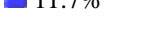

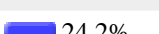
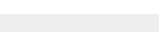
Table 3 (b) Motivation for use profile (Understanding the implications of softlifting)

Non Softlifters			Softlifters		
IMPLICATION	PERCENTAGE	No	IMPLICATION	PERCENTAGE	No
Infringing copyright law	 88.7%	(94)	Infringing copyright law	 80.8%	(97)
Civil or criminal prosecution	 60.4%	(64)	Civil or criminal prosecution	 53.3%	(64)
Negative media exposure for your company	 56.6%	(60)	Negative media exposure for your company	 43.3%	(52)
No assurance of quality or reliability	 61.3%	(65)	No assurance of quality or reliability	 53.3%	(64)
No technical support	 71.7%	(76)	No technical support	 78.3%	(94)
Exposure to threat of viruses	 59.4%	(63)	Exposure to threat of viruses	 46.7%	(56)
No warranty on products	 68.9%	(73)	No warranty on products	 74.2%	(89)
You pay more for upgrades	 28.3%	(30)	You pay more for upgrades	 18.3%	(22)
Government revenue is lost	 27.4%	(29)	Government revenue is lost	 25.8%	(31)
One job less is created	 38.7%	(41)	One job less is created	 25.0%	(30)

All the implications of softlifting provided in Table 3 (b) are valid implications of softlifting and software piracy. Infringement of copyright laws was the prominent implication recognized by both groups (88,7% and 80,8%). No technical support (71,7 % and 78,3%) and no warranty (68,9% and 74,2%) were the other prominent implications recognized by DCSSs. The rest of the implications of softlifting are not well recognized, particularly by the DCSS with more than 43.7% (civil or criminal prosecution) up to 81,7% (you pay more for upgrades) not being aware of other prominent implications of softlifting. The Chi-square test value ($\chi^2=7.5125$ $df=9$, $p\text{-value}=0,5839$), however, was not significant. The null hypothesis of no dependency between type of user and knowledge of the implications of softlifting is accepted. *H7 distance computing students who have less knowledge of the implications of softlifting are more likely to softlift than those who do* is thus rejected.

5.2.3 Reasons for Use

Table 3 (c) Motivation for use profile (Reasons for use)

REASON FOR USE	PERCENTAGE	No.
Software is too expensive to buy	 85.8%	(103)
I cannot afford to buy a new version every few months	 64.2%	(77)
Software companies make enough money	 11.7%	(14)
I want to test software before I decide to buy it	 40.8%	(49)
Software should be freely available	 24.2%	(29)
It is too easily done, therefore it is not a crime	 7.5%	(9)
I copied a legal version - it's not like I'm	 8.3%	(10)

robbing somebody		
I only use it for personal or educational use		50.0% (60)
It is only illegal if I get caught		2.5% (3)
Everyone is doing it, so why should I pay for it?		9.2% (11)
One is allowed to make a backup in case something happens to it, so it must be okay to use it on another machine		15.0% (18)
I didn't copy it - a friend gave it to me		13.3% (16)
Trial versions don't allow me enough time to evaluate a product		32.5% (39)

From table 3 (c), and from general comments that the DCSS were allowed to add to the end of the questionnaire (Annexure A), it is clear that cost (85.5%) is the predominant reason forwarded by the DCSS to “justify” softlifting. The regularity with which newer versions are released (64,2%) is the next dominant reason. Other prominent justifications were that the software was for personal or educational use (50%); that they do not want to buy (expensive) software if they are not sure they will continue using it (trial versions don't allow me enough time to evaluate a product - 32.5%); and that they want to test software before they decide to buy it (40,8%).

5.3 Sources

Source parameters proposed were Having Friends Who Softlift, Having Three or More Friends Who Softlift, the WWW and Counter Copies.

Table 4 (a) Sources profile (Having friends who softlift)

Non Softlifters (NS)			Softlifters (S)			
FRIENDS	PERCENTAGE	No.	FRIENDS	PERCENTAGE	No.	Ratio S/NS
True		65.1% (69)	True		(115)	1.67
False		34.9% (37)	False		(5)	0.14
TOTAL		100.0%	TOTAL		120	

Table 4 (b) Sources profile (Having 3 or more friends who softlift)

Non Softlifters			Softlifters			
RESPONSE	PERCENTAGE	No.	RESPONSE	PERCENTAGE	No.	Ratio S/NS
True		50.9% (54)	True		(109)	2.0
False		49.1% (52)	False		(11)	0.21
TOTAL		100.0%	TOTAL		120	

Table 4 (c) Sources profile (Sources of illegal software)

SOURCES	PERCENTAGE	No.
I downloaded the software and license (serial number, key generator, patch etc.) from the Internet		65.0% (78)
A friend gave me softlifted software		74.2% (89)

A friend borrowed me his legal copy with legal license to use, which I now use		49.2%	(59)
I bought it over a counter		11.7%	(14)

The ratios shown in tables 4 (a) and (b) seems to indicate that having friends, and having 3 or more friends who softlift, to contribute to softlifting. Both Chi-square test values ($\chi^2=35.1486$ df=1, p -value=0,0001) and ($\chi^2=44.5445$ df=1, p -value=0,0001) and Fisher’s Exact Tests ($p=1,105E-11$) and ($p=1,109E-11$) supported this assertion. The null hypotheses of no dependencies are thus rejected. H9 *distance computing students who have friends who softlift are more likely to use illegal software than distance computing students who do not have friends who softlift* and H10 *distance computing students who have more than 3 friends who softlift are more likely to use illegal software than distance computing students who do not have more than 3 friends who softlift* are thus accepted.

Table 4 (c) further confirmed this relationship by showing friends (74.2%) to be the most important source of softlifted software. The Internet (65%) was the next most important source. Nearly half of the DCSS possessed “legal” copies which they borrowed from friends but which are illegal since license agreements explicitly forbids this practice. Counter copies formed a small percentage of their softlifted applications.

5.4 Usage Patterns

Usage patterns parameters suggested were Types of Applications, Number of Applications and Rate of Usage.

5.4.1 Types of applications

Table 5 (a) Usage patterns profile (Types of applications used by the DCSS)

TYPE OF AOOLICATION	PERCENTAGE	No.
Entertainment		57.5% (69)
General Productivity (word processing, spreadsheet, presentation graphics, etc)		69.2% (83)
Professional Applications (accounting, programming, professional drawing etc.)		66.7% (80)
Operating System		63.3% (76)
Education		13.3% (16)
Utilities (anti-virus, communications, system etc.)		50.0% (60)


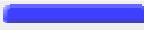
Table 5 (a) shows the DCSS to possess variety of softlifted applications. General productivity and professional applications heads the list, with educational applications softlifted the least.

5.4.2 Number of Applications

Table 5 (b) shows the majority (55,9%) of DCSSs to possess more than 10 softlifted applications. From another perspective, the majority (75,9%) of DCSSs possesses either many (>15, 39,2%) or few (2-5, 36,7%) softlifted applications.







Table 5 (b) Usage patterns profile (Number of applications possessed by the DCSS)

NUMBER OF APPLICATIONS	PERCENTAGE	No.
1		7.5% (9)
2-5		36.7% (44)
6-10		11.7% (14)
11-14		5.0% (6)

15 or more		39.2%	(47)
TOTAL		100.0%	120

5.4.3 5.4.3 Rate of Usage

Table 5 (c) Usage patterns profile (Rate of usage of softlifted applications by the DCSS)

RATE OF USAGE	PERCENTAGE	No.	
20% and less		44.2%	(53)
21-40%		16.7%	(20)
41-60%		15.0%	(18)
61-80%		13.3%	(16)
81-100%		10.8%	(13)
TOTAL		100.0%	120

It is apparent from Table 5 (c) that the majority of DCSSs do not use all of their softlifted applications on a regular basis.

5.5 Additional comments by students

Students were invited to submit their own comments on the issue of softlifting at the end of the questionnaire. Sixty-four DCSSs did submit a comment. These comments are available online at <http://osprey.unisa.ac.za/comments.html>. With exceptions, students used this opportunity to “justify” their softlifting endeavours. A review revealed cost of software to be the most popular justification forwarded, followed by references to the Open Source software model.

One comment encompasses this assessment:

“I am in Information Technology. I earn SUBSTANTIALLY less than my counterparts in the States and Europe. I don't for a second believe it is honest to use pirate software, but I am afraid if I have to buy everything, my company will go under. If I am put in a situation where I am forced to pay for everything on my machine, I will uninstall it and only start using open source software. I am waiting for that day...and the money I will save, I will donate to the open source community. The software I produce is open source, too, by the way. Why don't I do it already? Because everyone else wants their documents in MS Word format and my secretary is scared of the Linux desktop interface.” Comment 13.

Where applicable, further references to some of these comments are made in the discussion of the results, which follows next.

6 DISCUSSION

In order to develop a demographic profile of the distance computing student softlifter, several alternative hypotheses were forwarded. Results from statistical analysis were presented in the previous section. A brief discussion on these results follows.

6.1 Demographic profile

One of the motivations for the present study was that the student body of a distance institution represents all age groups whereas residential students typically fall into the 18-25 years of age category. Statistical analysis confirmed a significant relationship to exist between type of user (softlifter or non-softlifter) and age group. Specifically, softlifting was found to be more prevalent in the 21-30 years of age group categories. Few softlifters were under the age of 20 years with less than a quarter of softlifters over the age of 31 years. In the context of the age range of the current

population, the results support the findings of Kini, Rominger and Vijayaraman (2000) and Nyaw en Ng (1994) who reported older people to softlift less.

Statistical analysis also supported gender as a predictor. A higher proportion of males (61%) admitted to softlifting than females (37%), a finding in agreement with Wong (1985), Simpson et al (1994), Sims et al (1997) and Moores & Dillon (2000), all whom reported male students to use illegal software more than females. Copious explanations for patterns of gender crime exist across a variety of disciplines. Here, a cursory analysis of the current results revealed females to be more sensitive towards perceived negative consequences of softlifting (such as infringement on copyright law and civil or criminal prosecution). The author thus concurs with Lampert and Yassour's (1992) viewpoint that females tend to be lower risk takers than males and therefore less likely to softlift.

As predicted, the majority of distance computing students were employed full-time. Given strict workplace regulations on illegal software use, the distance computing student's demand for softlifted applications was expected to be less than that of the residential student. Work status, however, was not a significant predictor of softlifting, perhaps because work status does not necessarily imply economic capacity to purchase legal software. Hence students were also asked to specify their disposable income per month.

Students are believed to softlift because they do not earn a substantial income and therefore cannot afford software (Sims et al, 1997; Husted, 2000). Whereas the residential student's disposable income is primarily derived from part-time employment and parental support, 50% of the DCSS were found to earn a salary that can be classified as higher middle-income. While, in theory, they should be able to meet the expenses of software, they still viewed software as being too expensive. This finding is in direct contrast to Husted (2000) who found a lower level of income to correlate with higher incidences of softlifting. Disposable income, however, was not confirmed a predictor of softlifting. Given the results, perhaps the implication here is that it is not so much affordability (i.e. cost as a percentage of disposable income) that drives softlifting, but a sentiment that software is overly expensive, i.e. you pay too much for what you get, particularly given the Open Source movement which offers comparable functionality. Software, off course, is arguably overly expensive *because* of lower revenue as a result of softlifting and piracy!

A significant relationship was found to exist between years of computing experience and softlifting. The ratio between illegal versus legal software use increased with experience, supporting computer experience as a key predictor of the DCSS. This finding is in apparent contrast with Shore et al (2001) who did not find any relationship. In the current population, computer experience is probably the product of (a) the average DCSS's age - being older and thus having more years of computing experience, (b) the DCSS's likely employment in a computer-related field, and (c) the DCSS being a student in computer studies. Given other results, it is suggested that computer experience may also contribute to softlifting in that experienced students know how to find, download and use keymakers, serials and patches from the Internet.

Being employed in a computer-related field is also believed to contribute to or deter from softlifting. For example, having an intimate knowledge of computing software (being employed for that knowledge) may attract some to the act of softlifting but deter others. While the majority of students (both softlifters and non-softlifters) were indeed employed in a computer-related field, there was no statistical evidence to support the viewpoint that being employed in the field of computing is a predictor of the DCSS. The best conjecture that can be made is that being employed in a computer-related field contributes to computing experience, which proved a significant predictor of softlifting.

6.2 Motivation for Use profile

In the current study, ethical viewpoint refers to the principle of right and wrong. Some research has attempted to identify ethical factors that influence the individuals' piracy act (Al-Jabri & Abdul-Gader, 1997; Lin, Hsu, Kuo and Sun, 1999). Models developed from these research efforts are

based on various theories of association, behavior and decision-making. Regardless the model applied the act of softlifting remains wrong according to most laws. There is and can not be any justification for softlifting. While the majority of distance computing students agreed with this viewpoint, disturbing percentages (34,9% and 42,5%) of non-softlifters and softlifters held the view that there exists *some* “justification” for softlifting. The majority of the DCSSs’ comments (Appendix A) are, in fact, “justifications“ for softlifting.

Some examples of these “justifications” are:

“If you use pirate software to make money it is wrong. It is fine to pirate software to educate yourself”. Comment 29.

“Once certain software manufactures release reliable/bug free software I’ll consider paying for it”. Comment 36, Appendix A.

“To charge a private individual the same as a company for something he will only use a fraction of is as wrong as using illegal software itself. I would happily legalize my software if it was reasonably priced and upgrades thereafter were free or vastly cheaper than the original”. Comment 59.

Ethical viewpoint, however, was not a significant predictor of the DCSS. There was, however, some statistical evidence to suggest that softlifters “might be” less ethically inclined than non-softlifters, supporting earlier studies by Cohen & Cornwell (1989) and Glass & Wood (1996) who found that college students do not view software piracy unfavorably or unethical.

In terms of understanding the implications of softlifting, the DCSSs (and the non-softlifters) perceived ignorance was astounding. All the implications listed were well-know implications of softlifting, yet only 53,3% of DCSSs were aware that criminal prosecution can result from their activities! The summation is once again that DCSSs justify softlifting in whatever pretext, as long as it suits the purpose. The results, however, did not prove significant and Understanding the Implications of Softlifting is thus not included as a predictor of the DCSS profile.

Cost of software was found to be the leading reason why the DCSS softlifts, supporting anecdotal evidence that students find software too expensive. As indicated earlier, the majority of DCSSs who responded, however, earns an income above the national average and hence this result must be viewed with some suspicion. As suggested earlier in the discussion, students perhaps feel that they do not receive value for money with their justification the Open Source movement.

“How is it possible that a program like Linux with all its affiliates can generate free software but a company as big as Microsoft has to make software so expensive...!” Comment 21.

Software is more expensive, off course, because of piracy!

6.3 Sources profile

The current population is geographically dispersed and thus friends, as opposed to fellow students, were proposed to be a major source of softlifted software. The results confirmed this opinion. Having friends (and having more than 3 friends) who softlift probably not only makes it easier to obtain illegal software (more sources), but may also provide the stimulus required to become a softlifter. The results support those of Sims et al (1997) and Solomon & O’Brien (1990). The results also appear to support the notion that the WWW is becoming a major source of illegal software. With a higher disposable income, the DCSS can probably afford premium Internet connections from home which makes it easier to download software, key generators, serials and patches from WWW sources. While the current study did not test for the friend’s “sources”, it is probably safe to assume that they share an enthusiasm for the Internet and associated softlifting activities.

6.4 Usage Patterns profile

The DCSS was found to make use of a broad spectrum of illegal applications. While it is unlikely that the DCSS use their illegal applications at work due to strict business regulations covering the possession of illegal software on work computers, professional applications featured high on the list of illegal software. Home education software and operating system software were expected to feature prominently, but did not. One reason could be that the faculty has several student license agreements (some free) with several software vendors in place, therefore negating the need for students to softlift within these groups of software.

More than half of the DCSSs admitted to having more than 10 softlifted titles in their possession, with nearly 40% having 15 or more softlifted applications in their possession. Possessing a large number of softlifted applications does not mean that they are used on a regular basis, however. For this purpose the DCSSs were asked to indicate their rate of usage of softlifted applications. However, Rate of Usage showed the DCSS not to use of these softlifted applications on a regular basis - probably explained by the fact that they are unlikely to use it at work.

7 SUMMARY

Based upon the results obtained, the profile of the DCSS can thus be predicted and profiled as follows:

The distance computing student softlifter is more likely to be male. They fall in the younger (in terms of distance student spreads), age groups. The more computer experience they have, the more they softlift. There is some evidence to suggest that they do not view softlifting as unethical. They forwards cost of software as the major reason they softlift, and have friends who softlift. Having 3 or more friends who softlift increase the chance that they softlift. These friends and the Internet are their major sources of softlifted applications. While they softlift a variety of applications, they do not use the majority of their softlifted applications on a regular basis. Professional applications are the most popular application softlifted.

Parameters not supported by statistical analysis and thus not included in compiling the profile of the DCSS were Work Status, Disposable Income, Employed in a Computer-related Field and Understanding the Implications.

In conclusion it is evident that the DCSS profile does not differ much to that of the residential student softlifter. As in other studies, age, gender and computer experience have been shown to be reliable predictors of the student softlifter profile. Where there are contradictions and/or differences, they are slight and perhaps circumstantial. For example, whereas younger residential students are more likely to softlift entertainment applications, the distance computing student softlifter who is older, employed and far more computer experienced will softlift applications appropriate to their requirements. It is also clear that softlifting is as prevalent under distance computing students as under residential students.

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