

software piracy: graduate student attitudes and intentions

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ABSTRACT

This study sought to understand the reasons behind graduate students' attitudes towards piracy in the context of an international graduate school. The theory of planned behavior (TPB), (Ajzen, 1988) was used as the basis for the research framework. The model developed by Peace, Galletta and Thong (2003) is extended by incorporating other variables derived from the review of the literature, including demographic variables (age, gender, academic major, financial status, marital status, educational level attained, and ethnicity), religious commitment, and computer knowledge.

The major purposes of this study were (a) to investigate the influence of selected demographic variables on piracy attitude and piracy intention; (b) to determine the relationship between social norms, piracy attitude and perceived behavioral control, and software piracy intention; and (c) to determine whether software piracy intention can be predicted directly and indirectly based on background variables, one's perceptions of institutional position, punishment certainty, punishment severity, software cost, religious commitment and computer knowledge.

Factor analysis was conducted on the data. Eight factors were extracted and named piracy attitude, religious commitment, software cost, perceived behavioral control, low punishment, harsh punishment, personal shame, and institutional position.

One of the interesting findings is that perceived institutional position toward software piracy and personal shame were negatively related to piracy intention, indicating that a strong stand by a school against piracy and an increase in shame of pirating software could reduce the intent to pirate software.

Information technology shapes the way almost everything is done in the world, from teaching, buying and traveling, to selling, advertising, doing business, forecasting the weather, and many other daily activities. All these operations and activities are improved by its use. In spite of all these opportunities, however, information technology has created new challenges for its users. According to Salehnia (2002), "Information technology has created new social and ethical dilemmas by influencing and producing situations that can conflict with existing laws, rules, traditional ethical and moral principles as well as cultural norms and values" (p. i).

One of the ethical dilemmas created by information technology is the appropriate use of software. Software users would like to have the freedom to use the software they purchase the way they want and without restriction: sharing it with friends or using one copy for all the computers they own. On the other hand, software developers and publishers would prefer (and often require) each user to buy a separate copy of software for each computer or at least to

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comply with the licensing agreement (De George, 2003). To attain their objectives, software companies have tried to fight piracy through various techniques including education, lobbying, lawsuits (Marron & Steel, 2000), and moral claims (De George, 2003). Even so, software piracy is still rampant. The Business Software Alliance (BSA) (2006) estimated that 35% of the software installed worldwide on computers in 2005 was pirated in 2004, an estimated \$34 billion in lost revenue. While the Asia Pacific region had the lowest piracy rate amongst emerging regions, such as Latin America, Middle East/Africa, it did not offer a better picture of software piracy rates than the worldwide average for the same year. Four of the five countries with the highest rates of software piracy (China, Indonesia, Pakistan, and Vietnam) were found in this region (BSA, 2006).

Unfortunately for software publishers, software piracy occurs not only in business, but also in schools. A study done in Brunei Darussalam found that 74% of students admitted having used pirated software (Rahim, Seyal, & Rahman, 1999). Another large study by IPSOS (2003) involving 1000 United States college and university students reported that 89% of students downloaded commercial software without paying for it. Commenting on these findings, Smiroldo, Vice President for Public Affairs for the BSA said that “if [students] are used to downloading materials like movies and music they will take that illegal activity and download productivity software for the workplace” (as cited in Scott, 2004, p. A30). Therefore, giving students appropriate education about piracy and finding out their perceptions and attitudes has become a necessity.

Student software piracy has been studied from different perspectives. Some studies have tried to identify the relationships between software piracy and factors such as age, gender, area of concentration, level of income, morality, and other characteristics (Ang & Lo, 1998; Chiang, 2002; Kini, Ramakrishna & Vijayaraman, 2004; Rahim et al., 1999). Other studies have been done to determine why students tend to pirate software. Chiang (2002) concluded that the reasons for student piracy include the high software demand for their class activities, their superior technical skills (as compared to the general population), the low level of disposable income, the high cost of a university education, and the presence of peers with a similar mindset. Wong (1994) found that students believed that duplicating software for private use and for learning about computers, without an objective to earn money, was not immoral.

Most of the software piracy studies have taken place in developed countries (Ang & Lo, 1998; Chiang, 2002; IPSOS, 2003; Villazon, 2004), but a few have been done in developing countries (Fang, Hongxia, Hengjia & Ming, 2005; Kini et al., 2004). The Philippines, a developing country, has a software piracy rate of 71% (BSA, 2006). For every ten copies of software used in the country, more than seven were illegal. Furthermore, countries nearby also had high levels of software piracy in 2005, like Indonesia (87%), China (86%), Thailand (80%), Malaysia (60%), and Vietnam (90%) (BSA, 2006). In this particular region with a high rate of piracy, gaining an insight into the attitudes and intentions of students with different

socioeconomic and regional backgrounds toward software piracy can increase the understanding of factors influencing the problem.

Rationale

The use of software is now prevalent in most educational systems. The cost and requirements of commercial software are not necessarily accessible to most students and faculty members in countries with a low-level income. Software use and knowledge is important in today's environment. To be marketable in the workplace, one of the criteria for qualification for a position is that a person knows how to use computer software, not how he or she respects the intellectual property rights of software publishers. Between two applicants, one who knows how to use computer software and one who does not, it does not matter that the latter did not pirate to learn the software; the first applicant will be preferred because of his or her superior software knowledge

This study looks at the attitudes and intentions of students toward software piracy in a developing country. We sought to (a) understand the influence of selected demographic variables on piracy attitude and piracy intention, (b) determine what relationship exists (if any) between social norms, piracy attitude, perceived behavioral control, and software piracy intention, and (c) determine whether software piracy intention can be predicted directly and indirectly based on one's perceptions of institution position, punishment certainty, punishment severity, software cost, religious commitment and computer knowledge. Further developing a model by Peace, Galletta, and Thong (2003), we sought to verify findings of previous studies about student attitudes and intentions towards software piracy in different environments. We further enhance the model with the addition of two new possible factors: institutional position on piracy and the concept we have titled "shame."

Theoretical framework

This study adopts the theory of planned behavior (TPB) as the basis for the research framework. The major premise of the TPB, an extension of the theory of reasoned action (TRA) (Ajzen, 1988), is that intention is the principal determinant of behavior (Ajzen, 1988). Intention, in turn, has three determinants: attitude toward the behavior, subjective norms, and perceived behavioral control (Ajzen & Fishbein, 2005). *Attitude* toward the behavior corresponds to the individual's positive or negative evaluation of the outcome of performing the behavior as well as beliefs about the result of undertaking the action.

Subjective norms refer to how an individual perceives referent groups' (parents, friends, faculty, etc.) pressure on him or her to perform or not to perform the behavior. The more referent groups approve of a certain behavior, the more likely the person is to execute it. When the attitude of the individual toward a behavior and the encouragement of referent groups to perform an act are both strong, the person will be even more likely to perform the behavior. This works essentially for behaviors under volitional control (Ajzen, 1988). These behaviors are relatively

simple and their successful accomplishment “require only the formation of an intention” (Armitage and Christian, 2003, p.191).

Not all behaviors are under complete volitional control. Other factors like skills and opportunities can hinder the performance of an intended behavior. The third component, *perceived behavioral control*, deals with behaviors that are not under complete volitional control. It refers to the perceived ease or difficulty of performing the behavior (Ajzen, 1988).

The TPB also postulates that a variety of cultural, personal, and situational factors influence behavioral, normative and situational beliefs but does not emphasize their effect (Ajzen & Fishbein, 2005). These factors play a background role by influencing the beliefs of people. They include things such as “age, gender, ethnicity, socioeconomic status, education, nationality, religious affiliation, personality, mood, emotion, general attitudes and values, intelligence, group membership, past experiences, exposure to information, social support, coping skills, and so forth” (p.197). This study suggests that the intention to pirate software can also be influenced by the individual attitude toward piracy, the perceived approval or disapproval of friends, parents or society, and the ease or difficulty of pirating or not. Similarly, Higgins and Makin (2004) found that associating with deviant peers and a positive attitude toward software piracy were important predictors of piracy.

Peace et al. (2003), based on the TPB, developed a model targeting the understanding of software piracy. Alongside attitudes, subjective norms, perceived behavioral control, and intention, the authors added three more variables: punishment certainty, punishment severity, and software costs. The model suggests that the probability of being punished, the degree of punishment and the cost of the software have an impact on the decision of an individual to pirate by influencing the person’s attitude and perceived behavioral control. The decision to pirate is the result of weighing the benefits and the cost of piracy. This model is the backbone of the study.

Several other factors may influence software piracy. The model is extended by incorporating other variables derived from the review of the literature, such as demographic variables (age, gender, academic major, financial status, marital status, educational level attained, and ethnicity), religious commitment, and computer knowledge. In the present study, the TPB, and six additional constructs (punishment certainty, punishment severity, religiosity, software cost, computer knowledge, institution position) serve as key dimensions influencing software piracy. The relationships between the constructs and selected personal descriptors are summarized in Figure 1.

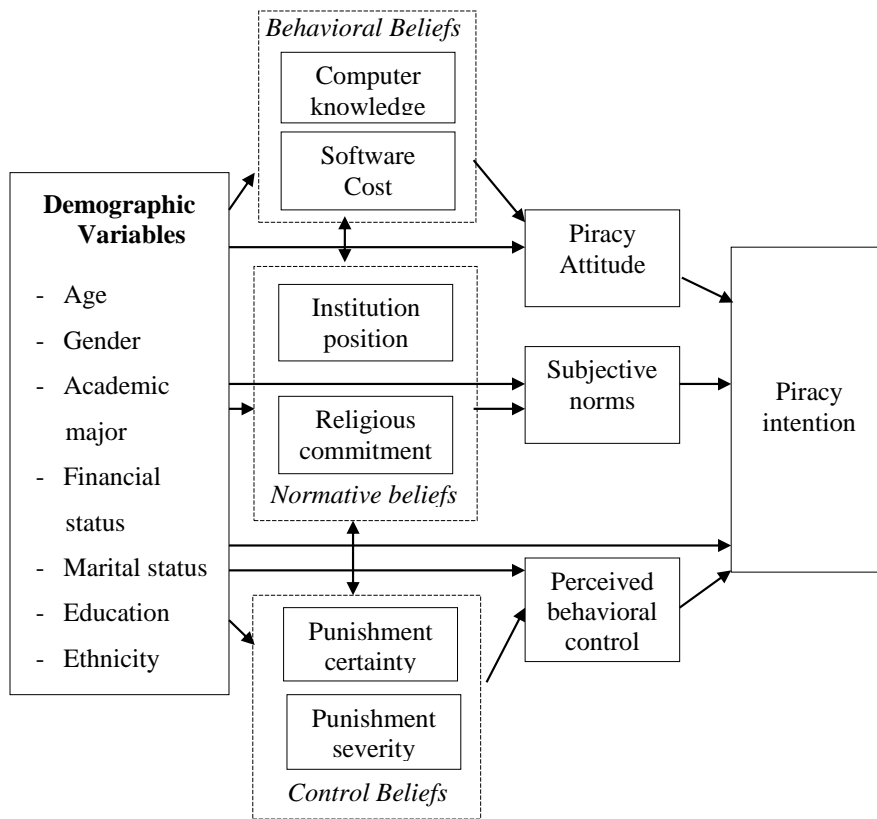


Figure 1: Theoretical framework of factors influencing software piracy

Methodology

In order to find out what drives students' intentions and attitudes toward piracy, an online survey was conducted at a faith-based graduate school in the Philippines in late 2006 and early 2007. All students were sent a link to the survey, and 132 of the 240 enrolled students responded. There was some resistance to filling out the questionnaire due to the moral and religious questions that were asked, which made some students uncomfortable. The questionnaire had 10 scales, with a total of 74 items, in addition to demographic questions. The various scales were analyzed for reliability, and found to be generally reliable (Table 1).

Table 1
Scales, Number of Items, and Reliability Data

Factors	Initial reliability		Final reliability	
	n _i	α _i	n _f	α _f
Attitudes supporting piracy	13	.886	13	.886
Software cost	7	.869	7	.869
Harsh punishment	5	.776	5	.776
Religious commitment	5	.805	5	.805
Institution position	6	.692	6	.692
Perceived behavioral control	7	.846	7	.846
Personal Shame	3	.573	2	.749
Low punishment	3	.695	2	.717
Piracy intention	8	.866	8	.866
Computer knowledge	17	.925	17	.925
Total items	74		72	

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Younger students and single students had a more permissive attitude toward piracy. Males were more likely to pirate than females. At the same time, males were more likely to be influenced by perceived behavioral controls than females. The piracy intention of males was significantly higher than females ($p < .001$). At the same time, both genders were unsure as to whether there might be negative consequences associated with piracy.

One of the interesting findings was that the various ethnic groups demonstrated significant differences in attitudes and intentions toward piracy.

The correlations between religious commitment, piracy attitude, piracy intention, harsh punishment, low punishment, computer knowledge, institution position, personal shame, perceived behavioral control, and software cost are presented in Table 2.

The analysis of Table 2 shows that three variables: low punishment, perceived behavioral control, and personal shame were moderately related to piracy attitude. Low punishment had the highest correlation. This seems to imply that the perception that there would be little or no punishment had a major impact on the attitude of an individual toward software piracy. Personal shame was negatively related to piracy intention. The more a person feels guilty, the less he or she will have a positive attitude toward software piracy. Perceived behavioral control was positively related to piracy attitude. The more a person perceived that he or she had the opportunities and skills to pirate software, the more he or she had a favorable attitude toward software piracy. However, this does not necessarily explain the relationships between piracy and perceived behavioral control. In fact people may have opportunities and skills to pirate software but do not have a positive piracy attitude. As suggested by Ajzen and Fishbein (2005),

relationships may exist between these variables “because they may be based in part on the same information” (p.195). In this study, perceived behavioral control and piracy attitude may be related because of information that influences both.

Five variables (piracy attitude, software cost, perceived behavioral control, low punishment and personal shame) had moderate or higher correlations with piracy intention. Of the four variables, piracy attitude had the highest correlation with piracy intention, followed by low punishment and perceived behavioral control. Low punishment was highly related to both piracy attitude and intention.

The results of a correlational analysis (see Table 3) reveal a small, but significant relationship ($r = .185$) between normative beliefs and control beliefs. This would imply that there is some relationship between societal norms and an [individual's](#) perception of their ability to pirate software. No significant correlations were found between behavioral beliefs and normative and control beliefs.

Table 2
Correlations Between Scales

Scale	1	2	3	4	5	6	7	8	9	10
1. Piracy attitude	1	.226(**)	-.263(**)	-.093	-.207(*)	.361(**)	-.327(**)	.571(**)	.753(**)	.039
2. Software cost	.226(**)	1	-.084	.137	-.078	.312(**)	-.113	.234(**)	.333(**)	.138
3. Harsh punishment	-.263(**)	-.084	1	.006	.249(**)	.016	.324(**)	-.386(**)	-.257(**)	.012
4. Religious commitment	-.093	.137	.006	1	-.029	-.012	.075	-.003	.014	-.124
5. Institutional position	-.207(*)	-.078	.249(**)	-.029	1	-.035	.237(**)	-.109	-.179(*)	.042
6. Perceived behavioral control	.361(**)	.312(**)	.016	-.012	-.035	1	-.068	.286(**)	.504(**)	.421(**)
7. Personal shame	-.327(**)	-.113	.324(**)	.075	.237(**)	-.068	1	-.249(**)	-.391(**)	-.096
8. Low punishment	.571(**)	.234(**)	-.386(**)	-.003	-.109	.286(**)	-.249(**)	1	.516(**)	.135
9. Piracy intention	.753(**)	.333(**)	-.257(**)	.014	-.179(*)	.504(**)	-.391(**)	.516(**)	1	.073
10. Computer knowledge	.039	.138	.012	-.124	.042	.421(**)	-.096	.135	.073	1

* p<0.05, **p<0.01

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Table 3

Correlations between attitudinal and belief constructs

Variables		1	2	3	4	5	6
1. Normative beliefs	r	--	.185(*)	-.035	-.040	-.226(**)	.235(**)
2. Control beliefs	r		--	.063	.144	-.032	.241(**)
3. Behavioral beliefs	r			--	.450(**)	.121	-.132
4. Perceived behavioral control	r				--	.361(**)	-.068
5. Piracy attitude	r					--	-.327(**)
6. Personal shame	r						--

* p<0.05, **p<0.01

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Figure 2 indicates a predictive model for software piracy intention. Four variables entered the regression model: software piracy attitude, perceived behavioral control, personal shame, and gender of the respondents. The relationship between intention and the predictor variables indicates that piracy attitude has a stronger association ($\beta = .560$) than perceived behavioral control ($\beta = .267$) and personal shame ($\beta = -.186$). Gender also influences piracy intention. Females are less likely to have positive attitudes toward piracy. This model suggests that around 67.7% of the variance in intention is explained by piracy attitude, perceived behavioral control, personal shame, and gender.

Looking more closely at the factors influencing piracy intention (Figure 3), we see that perceptions of low punishment for pirating had a stronger association ($\beta = .543$) than institutional position ($\beta = -.143$) and marital status (single) ($\beta = .161$). However, the institutional position on piracy does have a negative influence on piracy attitude. This model suggests that around 38.5% of the variance in attitude is explained by these factors. Students who felt that there was a lower

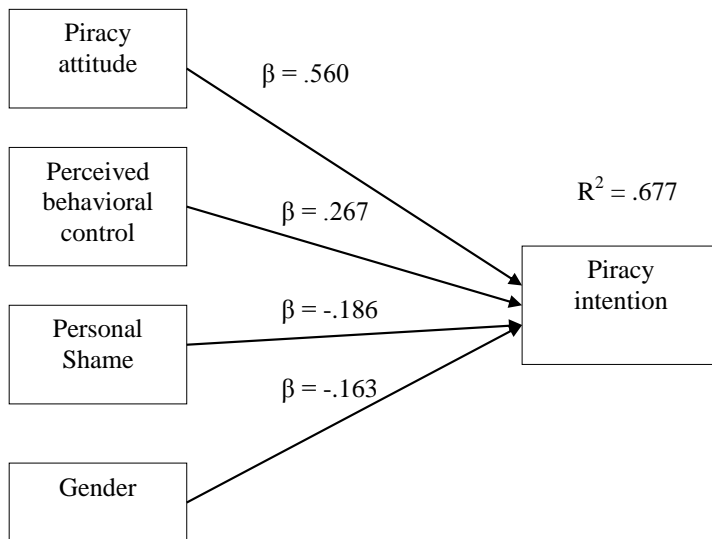


Figure 2: Piracy intention significant predictors

probability of being punished and who were single had a stronger piracy attitude. Students who perceived more strongly that the school used and encouraged the use of legal software had a more negative attitude toward software piracy.

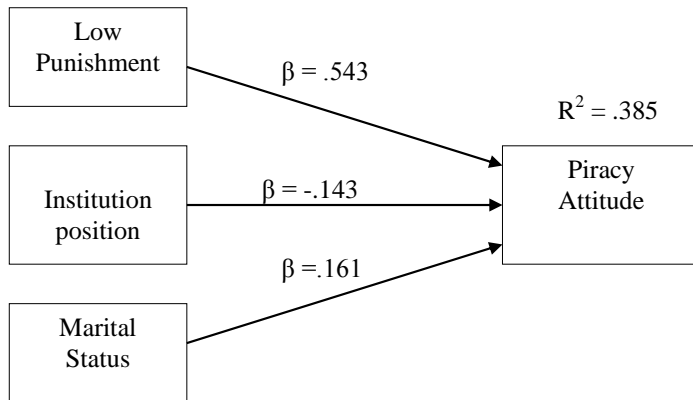


Figure 3. Piracy attitude significant predictors.

The relationships between perceived behavioral control and the variables which predict it (see Figure 4) indicate that computer knowledge ($\beta = .387$) had a higher association than the following variables in order of decreasing influence, software cost ($\beta = .189$), low punishment ($\beta = .170$), ethnicity ($\beta = .224$), degree pursued ($\beta = -.185$), and gender ($\beta = -.173$). Gender and degree pursued had negative relationships with perceived behavioral control. Being male and having a lower degree are all associated with lower perceptions of perceived behavioral control, while high computer knowledge, considering software expensive, considering punishment would be more severe, and being non-Filipino was related to higher perceptions of control. This model suggests that around 37.1% of the variance in perceived behavioral control is explained by computer knowledge, software cost, low punishment, ethnicity, gender and degree pursued.

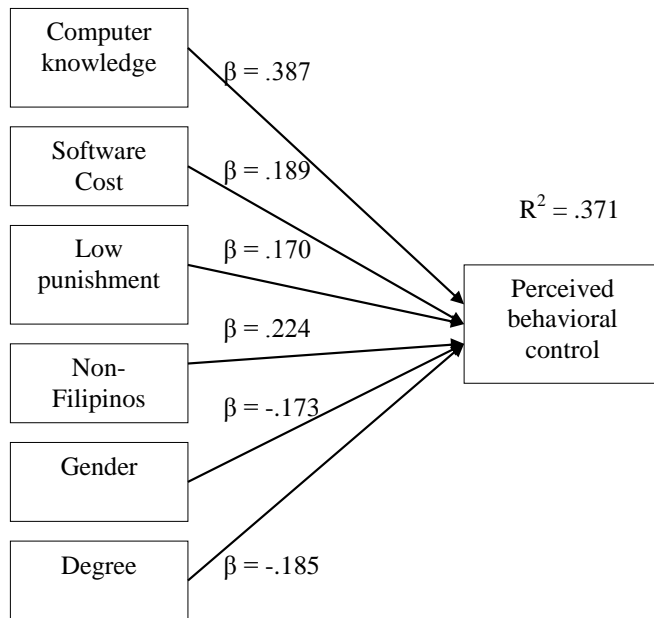


Figure 4. Significant predictors of perceived behavioral control.

Further analysis of the relationships between personal shame and the variables used to predict it (Figure 5) indicates that harsh punishment ($\beta = .293$) had a higher association than being non-Filipino ($\beta = .236$), institutional position ($\beta = .186$), and being a non-business student ($\beta = .176$). All four variables used to predict shame were positively related to personal shame. This model suggests that around 21.3% of the variance in personal shame is explained by perceptions of harsh punishment, being non-Filipino, institutional position, and being non-business student. Respondents who perceived that harsh punishment for copying software exist, that the institution or school uses and encourages the use of legal software, and were non-Filipinos and non-business students were more likely to have higher personal shame.

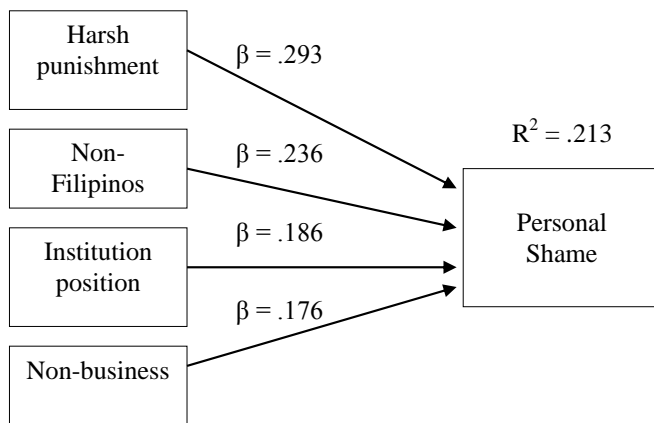


Figure 5: Personal shame significant predictors

Figure 6 shows the final model that was found from this research study. This model introduces the concept of ethnicity and shame in addition to the past models. At the same time, it would appear that cost and computer knowledge may only affect the piracy intention indirectly.

This new model can be particularly helpful in looking at piracy in culture where societal expectations and norms are prevalent and strongly enforced. It also shows that there is much we have yet to understand of how and why individuals pirate software.

Further research should be done, particularly in the light of the increasing quantity and quality of free software, to study the impact of non-commercial software on piracy. In addition, a larger broader study should be done in other institutions to see to what extent these results can be generalized. Future research should include a diversified population in term of religious environment including schools without religious orientation. The study could confirm the original theoretical framework of this study or challenge it by supporting the modified outcomes found in the final modeling within this study or purporting an adaptation.

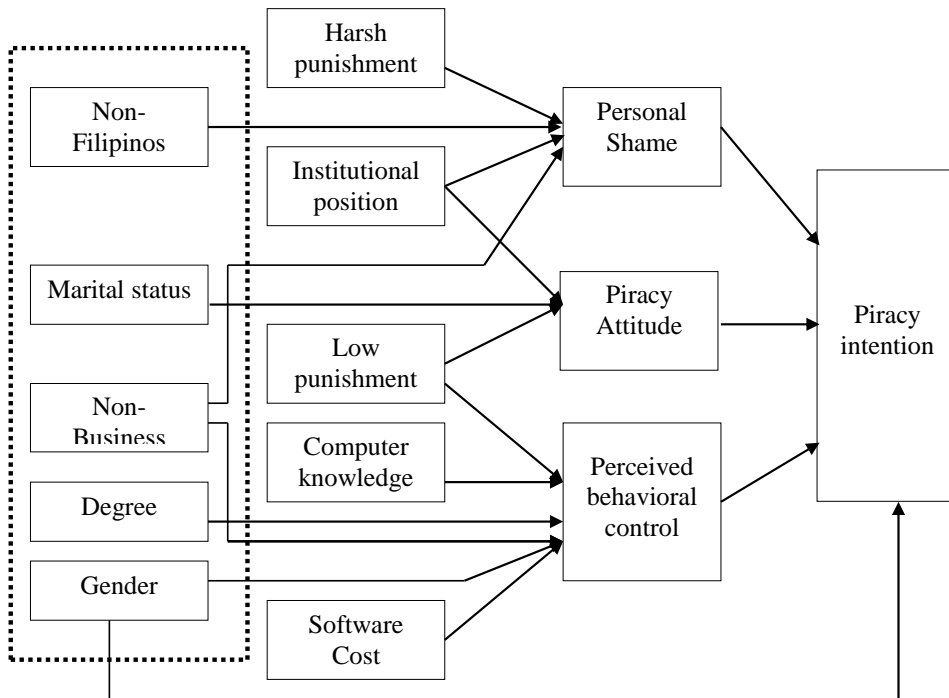


Figure 6: Final predictive model of software piracy intention

Another study should be done that uses a qualitative methodology to ask students questions about the reasons that push them to pirate software. A study of this type would give deep insight into the personal influences methodologically summarized by the quantitative data of this study.

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