Journal of Theoretical and Applied Information Technology
31st October 2021. Vol.99. No 20

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

PIRACY IN UNIVERSITY: FACTORS ASSOCIATED WITH DIGITAL PIRACY AMONG MULTIMEDIA STUDENTS

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ABSTRACT

Internet is especially important during the Covid-19 pandemic, where there is wide adoption of an online learning platform for teaching and learning. Students always utilize the Internet in many ways to meet their academic needs. Therefore, considerable attention has been given to the problem of digital piracy behavior among university students. This study aims to investigate the factors to be considered as part of digital piracy behavior among multimedia students. Guided by a theoretical perspective from Deterrence Theory, Ethics Theory, and Neutralization Theory, this study adopted a quantitative methodology where data from a survey (N=200) of multimedia students in public and private universities in Malaysia is analyzed. This study proposed a model that offers understandings of the contributing factors that may influence digital piracy behavior among multimedia students. Based on the findings, this study concluded that fear of legal consequences has the highest influence on digital piracy behavior, followed by perceived likelihood of punishment and neutralization techniques. This study may benefit other researchers attempting to understand multimedia students' standpoints on digital piracy behavior and increase user awareness in the computer ethics research area.

Keywords: *Digital Piracy, Intellectual Property, Computer Ethics*

1. INTRODUCTION

Intellectual property (IP) refers to a unique product or creation of the human mind [1] that has value in the market. For example, books, songs, paintings, drawings, chemical formulas, inventions, computer programs, and others. Copyright infringement, also known as piracy, is one of the intellectual property infringements. The Internet allows copies to spread quickly and widely and contribute to the issues of the increase in the rate of digital piracy.

Digital piracy can be defined as the act of downloading, copying, or distributing digital material with copyright and intellectual property for free [2]. Some factors may cause people to make pirated copies even though they know that it is illegal. For example, some people are knowingly committed to digital piracy because of the high profit that can be obtained. Due to the less attention on digital material, most people do not realize that some of the resources that they obtained from the internet were illegal. For example, the website that they are browsing had issued with digital piracy. There are still insufficient concerns of governments or authorities to take efficient action on digital piracy to block this illegal act [3] and this causes these illegal actions to continue to occur.

As the development of technology is growing rapidly nowadays, the use of Internet technology is a common phenomenon, especially among university students. For the past several decades, university students utilize the Internet in many ways to meet their needs especially in the aspects of academics. Internet is especially important during the Covid-19 pandemic, where there is wide adoption of an online learning platform for teaching and learning. All data or information is now digitalized and can be easily retrieved online. University students can easily acquire digital products or use them as their wish by simply search the keywords in the browsers.

This phenomenon seems to have no negative impact, but it raises a concern about digital piracy behavior. Almost all digital materials or products can be accessed freely or cheaper than the original one via Internet, despite some of them are pirated materials. Students are committing to digital piracy behavior unknowingly due to the low level of knowledge and awareness towards the digital piracy behavior. Besides, the lack of an effective method to decrease digital piracy also contributes to the issues. All the digital materials or products, except those open-source products, are protected by an intellectual property right. Gaining the copyrighted digital products without any cost will be considered copyright infringement.

In recent years, considerable attention has been given to associate digital piracy behavior among younger generations [4-5]. While many studies have explained student's perception of digital piracy behavior from multiple theoretical perspectives, the majority of the studies have relied on samples of university students [6-7]. Little is known about the correlates of the perception of university students in multimedia courses towards digital piracy behavior. This study argues that there is a need to understand the various perceptions of digital piracy behavior because unlike students in other courses, multimedia student's work is not limited to textual data only. Their academic tasks involve various types of digital data like audio, video, and images. The fact that the current plagiarism detector is only limited to detecting plagiarism and academic dishonesty that's in the form of texts may shape multimedia students' perception of digital piracy behavior.

Due to the lack of studies that investigate the prevalence of the digital piracy behavior among multimedia students, this study seeks to address the following research question: What are the factors associated with digital piracy behavior among multimedia students? Guided by a theoretical perspective from Deterrence Theory [8], Ethics Theory [9], and Neutralization Theory [10], this study attempts to investigate the factors to be considered as part of digital piracy behavior among multimedia students.

2. LITERATURE REVIEW

This section begins by laying out the theoretical dimensions of this study and looks at how recent works done in the area of digital piracy among university students.

2.1 Overview of Digital Piracy

Digital piracy is a well-known global issue that harms multiple industries [11]. Digital piracy refers to an action which an individual copy and publish copyrighted digital products without permission or authorization of their legal owner [6][12]. Digital piracy can be categorized into four subcategories, namely music piracy, software piracy, movie piracy, and video game piracy [11]. Digital products that are usually copyrighted may include software, books, movies, music, and art design. Digital piracy behavior can be seen in many techniques such as counterfeiting, softlifting, online piracy, client-server overuse, and hard-disk loading [13]. Panda Security [14] suggested that the many forms of pirating techniques explain why some individuals might purposely commit piracy behavior, whereas some might be involved in the illegal act unknowingly.

Previous studies suggested that digital piracy is an unethical behavior [9]. This is due to the consequences that come from digital piracy will not benefit the legal owner of digital products. Since the development cost of the original digital products is costly, and the duplicates cost almost nothing, [14] states that the proliferation of piracy will reduce the demand for legitimate digital products. The copyright owners have to bear the loss due to digital piracy.

2.2 Related Works on Digital Piracy Among University Students

Nowadays, university students often use the Internet for academic purposes. Due to the wide use of the Internet in facilitating students' assignments completion, the risk of digital piracy increases as students can easily copy and paste digital materials from the Internet. Previous research papers study the correlation between university students and digital piracy [3][9][15-16]. The finding shown in [3] indicates that Asian international students are more probably to justify digital piracy compared to American students. There are various forms of copyright violation that occurs in academic. [16] had suggested three forms of copyright violation among university student which makes some modification and adapt it in another study, duplicates and publishes it on media, and use the material or product without the permission of the copyright holder.

Previous studies have reported contributing factors of digital piracy among university students as summarized in Table 1. Many studies have examined the relationship between demographic factors and digital piracy

behavior. Among the demographic factors are gender [16-22][24-25], age [16-18][24-25], marital status [17], and educational level [17][21]. In [17], the research explores the attitude of the university students in a public university in Malaysia to the issues related to information copyright and analyzes differences in demographic characteristics of students such as age, level of study, gender, marital status, and computer. Their findings indicate that there are no significant differences across all demographic groups we found among students regarding their attitude towards information copyright. The study shows that university students tend to have a similar perception of digital piracy regardless of their demographic backgrounds.

Other contributing factors in prior research that can be linked to the digital piracy behavior among university students have been identified. Most of the factors are drawn from theoretical perspectives in behavioral study and social science. From the summary in Table 1, it can be seen that Theory of Planned Behavior [16][19-20][22-25], Ethics theory [2][6][18-21], Deterrence Theory [2][6][22-23], and Neutralization Theory [24-25] have been identified as major contributing theories in many works in digital piracy behavior among students.

In [22], Arli and Tjiptono have tested a research model of university students' intention to digital piracy behavior in the context of Indonesia, where the research model is drawn by integrating the theory of planned behavior, ethics theory, and deterrence theory. Their study found that the constructs from the Theory of Planned Behavior (attitude and perceived behavior control) and Ethics theory (moral obligation and perceived benefit) are the significant factors that contribute to digital piracy behavior among students. In addition, their study found that the constructs from Deterrence theory (fear of legal consequences and perceived likelihood of punishment) were not significant in predicting digital piracy behavior. The result is supported with the investigation by Lee et al. [25] on the effect of the construct from Deterrence theory toward digital privacy behavior that shows formal deterrence (legal punishment) was not significantly related to digital piracy among university students in South Korea. They note that the result could be possibly due to the ineffective law enforcement and regulations in most Asia countries. However, what is interesting in their study is legal sanction (e.g., service termination by the ISP) may play an important role in decreasing university students' intention to digital piracy behavior.

Despite many studies that investigate the factors of digital piracy behavior among university students, very few have studied the prevalence of the behavior among multimedia students. One of the works is by Wilhelm [24] that study (two undergraduate courses in media and communication studies.) The study examines the effect of neutralization (offenders' justification), towards media content preferences. The findings of this study indicate that the neutralization effect (denial of victim and denial of injury) was significantly associated with students' intention toward digital piracy, which in turn influences digital piracy behavior.

3. METHODOLOGY

This section provides the details of the quantitative methodology used in this study that covers the process in theoretical and research model development, instrument design, and data collection

3.1 Theoretical Framework and Hypothesis Development

This section will discuss the proposed theoretical framework as shown in Figure 1.

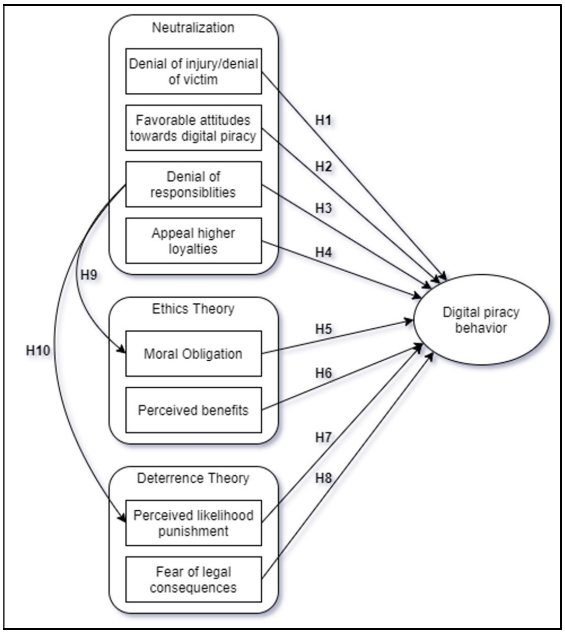

Figure 1: Research Model

All the theories used in the framework (Neutralization Theory, Ethics theory, and Deterrence theory) will be explained as well as review the construct of each theory for hypothesis formation. The theoretical framework integrates multiple theories because of the complexity of

digital piracy behavior, where the use of a single theory is proven to be insufficient [22].

3.1.1 Neutralization Theory

According to [26], neutralization can be known as a technique used by offenders to rationalize their deviant behavior, which is a circumstance that the offenders determine their illegal behavior as "legal". Besides, [27] states that neutralization techniques focus on how individuals handle social sanctions if they feel shame or guilt when they are involved in deviant behavior. Neutralization techniques refer to the offenders' actions that proffer a justification to defend their deviant behavior. The offenders use these neutralization techniques as avoidance mechanisms from the blame of others and self-blame [28].

[29] states that denial of injury is a technique related to an individuals' belief that the illegal behavior will not cause any injury or harm to the person who was affected. Perpetrators justified that their behavior did not cause any real or lasting harm [30]. According to [18], offenders use this neutralization technique to justify that there is no existence of any enduring or actual harm caused by their deviant behavior. [27] share the same opinion and suggests that offenders think that their behavior is harmless by giving an example that students with high achievement will refuse to admit that their fellow students will be affected by their deviant behavior. In addition to this, according to [29], offenders who applied this technique accept that there will be victims due to their illegal behavior, but they will consider that the victims deserve the punishment or consequences. In this case, perpetrators will shift the blame from themselves to the victim. Therefore, the following hypotheses are proposed:

H1: Denial of injury has an association with digital piracy behavior
H2: Denial of victims has an association with digital piracy behavior

[31] explain that most perpetrators who implicate in other unethical or illegal actions consider digital piracy as a moral action. Denial of responsibility is frequently used by offenders to make themselves innocent. They feel no guilt due to the reason that they do not think they should be responsible for the consequences of their act [32]. Additionally, previous research stated that one of the important predictors of digital piracy is the appeal to higher loyalties [24]. The offenders who did digital piracy advocate that they are not the only person who will gain the benefits from their actions, but other people as well [3]. They usually justified themselves as innocent even though they are digital pirating [32]. Therefore, the following hypotheses are proposed:

H3: Denial of responsibilities has an association with digital piracy behavior
H4: Appeal higher loyalties has an association with digital piracy behavior

3.1.2 Ethics Theory

Digital piracy has been declared by some researchers as unethical behavior and is an illegal act in many countries. According to Yoon [9], the ethical decision-making model [33] is usually employed as a theoretical base model to incorporate the ethical factors in many studies. Hunt and Vitell [33] classify normative ethical theories into two ethics theories, deontological theory (universal rules guiding right and wrong) and teleological theory (right and wrong are based on the consequences). Yoon [9] has then proposed these two theories in digital piracy studies as the moral obligation and perceived benefits constructs.

In [31], the paper states that lack of morality may be used as a factor to predict unethical or immoral behaviors. [22] suggested that the authorities should focus on the importance of moral education on digital piracy to increase moral awareness as well as the awareness of copyright infringement issues. They also state that perceived benefits (benefits and conveniences in terms of time and money) are a significant predictor of digital piracy. Offenders usually gain benefits from piracy at no cost or effort. Therefore, the following hypotheses are proposed:

H5: Moral obligation has an association with digital piracy behavior
H6: Perceived benefits has an association with digital piracy behavior

3.1.3 Deterrence Theory

[25] states that the classical deterrence theory postulate that individuals are rational in making every decision. This means that the individuals will be weighing the pros and cons resulting from their actions before engaging in digital piracy behavior. According to [9], many countries have declared digital piracy behavior as illegal and unethical behavior. People will refrain from committing digital piracy if they are afraid of being punished due to the severity and certainty of

the punishment [22]. The general population will avoid engaging in such behaviors since the perceived likelihood of punishment surpass the benefits of the action. [34] shows that there is a negative relationship between the level of illegal behavior and the severity and certainty of punishment. The lower the level of severity and certainty of punishment, individuals will be more inclined to engage in digital piracy behavior. In other words, digital piracy behavior can be inhibited by the threat of punishment.

Some offenders commit digital piracy behavior due to the knowledge deficiency about the action of digital piracy, the associated law, and the legal consequences of digital piracy. [23] states that usually individuals have no knowledge or interest about the penalty and piracy behavior. The severity of punishment can inhibit deviant behavior [34]. In addition, various research suggested that an individual's intention to have immoral behavior such as digital piracy is influenced by two factors, which are perceived likelihood of punishment and fear of legal consequences [22]. Therefore, the following hypotheses are proposed:

H7: Perceived likelihood punishment has an association with digital piracy behavior
H8: Fear of legal consequences has an association with digital piracy behavior

Offenders can justify their deviant behaviors as normal by using the neutralization technique to disengage themselves from moral responsibility [31]. On top of that, recent research states that there is a strong correlation between Neutralization Theory and Deterrence Theory [32]. Prior research suggested that an individual deserves the punishment for his or her behavior as long as he or she takes responsibility for them [35]. [36] clarifies that judgment of moral responsibility is required for penalty determination. Therefore, the following hypotheses are proposed:

H9: Denial of responsibilities has an association with moral obligation
H10: Denial of responsibilities has an association with perceived likelihood punishment

3.2 Instrument Design

3.2.1 Operational Definition

The operational definition of the dependent variables, independent variables, and modifying variables is shown in Table 2.

Table 2: Operational Definition of the Variables

Variables	Operational Definition
Digital piracy behavior	A state where an individual obtains the copyrighted digital products illegally.
Denial of injury	A state where an individual believes the loss caused by digital piracy is little.
Denial of victims	A state where an individual believes that no one gets hurts due to digital piracy behaviors.
Denial of responsibilities	A state where individuals feel that they are forced to do digital piracy.
Appeal higher loyalties	A state where an individual feels that there is a higher and greater cause that causes them to do piracy.
Moral obligation	A state where an individual feels wrong in doing digital piracy and feels guilty if does so.
Perceived benefits	A state where an individual perception of gaining benefits or positive consequences from digital piracy.
Perceived likelihood punishment	A state where an individual perceives the possibility to have negative consequences due to involvement in digital piracy.
Fear of legal consequences	A state where an individual does not want to have negative consequences.

3.2.2 Item Constructions

A structured questionnaire was used for data collection in this study. The questionnaire was divided into three parts namely Section A (demographic profiles), B (digital piracy behavior), and C (risk factors). Section B was measured through ordinal data and Section B and C used continuous data. Items in Part B and C were adapted from the previous study as shown in Table 3.

Table 3: Source of Items

Variables	Source
Digital piracy behavior (DPB)	[15]
Denial of injury (DOI)	[37]
Denial of victims (DOV)	[37]
Denial of responsibilities (DOR)	[37]
Appeal higher loyalties (ALP)	[37]
Moral obligation (MO)	[38]
Perceived benefits (PB)	[9]
Perceived likelihood punishment (PLP)	[39]
Fear of legal consequences (FLC)	[39]

3.2.3 Content Validity

Content validity was carried out to verify the representation and relevancy of the items in measuring the variables. The questionnaire is validated by three experts with a minimum experience of 5 years. The experts are selected based on their expertise in the field of computer ethics. Since there are only three experts involved, reviewed items will be eliminated if the items are deemed irrelevant by any of the experts, following the guideline by Lynn [40]. Hence, items with an I-CVI of less than 1 will be dropped. Some of the items are revised based on the comment of the experts. The number of items before and after content validation is shown in Table 4

Table 4: Content Validation

Variables	No of Item (Before)	Drop Item	No of Item (After)
DPB	9	NDPB4, DPB6, DPB9	6
DOI	5	DOI5	4
DOV	5	DOV4	4
DOR	7	DOR5, DOR7	5
ALP	5	APL4	4
MO	5	MO1, MO5	3
PB	5	PB3, PB4	3
PLP	5	PLP3, PLP4	3
FLC	5	NFLC2, NFLC4	3

3.2.4 Pilot study

A pilot study was carried out by collecting data from 50 respondents to determine the reliability of the questionnaire. The questionnaire's reliability is tested using the Cronbach alpha value for each variable. A total of nine variables (35 items) have been tested. Among the nine variables, seven variables are considered as highly reliable, which are digital piracy behavior (DPB), denial of injury (DOI), denial of victims (DOV), denial of responsibilities (DOR), appeal higher loyalties (APL), perceived likelihood punishment (PLP), and fear of legal consequences (FLC) with Cronbach's alpha value of 0.899, 0.859, 0.844, 0.847, 0.851, 0.853, and 0.954 respectively. The Cronbach's alpha value of perceived benefits (PB) is 0.733 and it is acceptable since it exceeds 0.7. moral obligation (MO) variable has Cronbach's alpha value less than 0.7. Therefore, item MO4 is eliminated to meet the minimum value requirement of Cronbach's alpha. Table 5 summarized the results of the reliability analysis.

Table 5: Reliability Analysis

Variables	Cronbach Alpha (Before)	Cronbach Alpha (After)	No of Item (After)
DPB	0.899	0.899	6
DOI	0.859	0.821	4
DOV	0.844	0.844	4
DOR	0.847	0.847	5
ALP	0.851	0.851	4
MO	0.447	0.813	2 (Drop MO4)
PB	0.733	0.733	3
PLP	0.853	0.853	3
FLC	0.954	0.859	3

3.3 Sampling

200 respondents that consist of undergraduates in multimedia courses from public and private universities in Malaysia were included in this study. This study had a sample size of 200 respondents and they were chosen according to the criteria in which 100 should be from public universities and another 100 is from private universities. There were no limitations set to the age and gender of the respondents. This study utilized proportional quota sampling, the abovementioned target sample was subdivided into equal proportions of multimedia students in public and private universities. The quota sampling method was used to evaluate the variable and make the findings general from the total population.

4. DATA ANALYSIS AND RESULTS

This section presents the result of data analysis involved in this study namely item analysis, factor analysis, correlation analysis, and regression analysis.

4.1 Respondent Profiles

Five demographics criteria are collected in the survey; namely age, gender, year, university, family income, and personal income. Table 6 displays the summary of demographics. For gender, the number of male and female respondents is equal. The same goes for the type of university, where 100 participants from each public and private university participated in the survey. For the year of study group, students from Year 3 group have the highest frequency which is 83 (41.5%), followed up by Year 1 which has 62 respondents (3%). The least group belongs to Year 2 which only has 55

respondents with a percentage of 27.5%. From Table 6, it can be seen that the majority of the respondents came from the family with incomes between RM 2,000 to RM 2,999 and RM 3,000 to RM 3,999 respectively which make up 100 out of 200 respondents (50%). There are no respondents that come from the family with incomes less than RM 1,000.

Table 6: Respondent Profiles

Categories	Description	Frequency	Percentage (%)
Gender	Male	100	50
	Female	100	50
Year of Study	Year 1	62	31
	Year 2	55	27.5
	Year 3	83	41.5
Type of University	Public	100	50
	Private	100	50
Personal Income	RM 0 – RM 499	185	92.5
	RM 500 – RM 999	15	7.5
Family Income	RM 1,000 – RM 1,999	18	9
	RM 2,000 – RM 2,999	50	25
	RM 3,000 – RM 3,999	50	25
	RM 4,000 – RM 4,999	36	18
	RM 5,000 above	46	23

4.2 Factor Analysis

Next, principal component analysis through varimax rotation is performed to reduce the number of items and grouped them based on their factor loadings. Any item with factor loading less than 0.3 or on more than one factor (cross-loading) is removed. All of the items that are grouped in Factor 1 comes from the same theory which is neutralization theory. Therefore, Factor 1 is renamed to neutralization technique because this factor is the combination of denial of injury, denial of victims, and denial of responsibilities variables. The results of the principal component analysis are shown in Table 7.

Table 7: Principal Component Analysis

Item Code	1	2	3	4
Neutralization Technique (NT)				
DOI1	.876			
DOV2	.704			
DOR3	.648			
DOR4	.643			
DOI2	.634			
DOI4	.599			
DOV3	.590			
DOR6	.584			
DOV1	.576			
DOR2	.471			
Fear of Legal Consequences (FLC)				
NFLC1		0.939		
NFLC3		0.920		
NFLC5		0.908		
Perceived Likelihood of Punishment (PLP)				
PLP5			0.896	
PLP1			0.835	
PLP2			0.700	
DOI3			0.680	
Perceived Benefits (PB)				
PB2				0.828
PB1				0.771
DOR1				0.586
Total amount of variance	9.414	3.704	2.562	1.381
Total % of variance	36.207	14.247	9.855	5.312
Cumulative %	36.207	50.454	60.309	65.621

4.3 Correlation Analysis

Correlation analysis was carried out to evaluate the strength of the relationship between variables. Spearman Rho correlation analysis is used to test the association between variables understudied due to non-normal distribution. Table 8 summarized the results of correlation analysis.

Table 8: Correlation Analysis

	DPB	NT	FLC	PLP	PB
DPB	1	-	-	-	-
NT	0.513**	1	-	-	-
FLC	0.367**	0.023	1	-	-
PLP	0.513**	0.384**	-0.058	1	-
PB	0.375**	0.598**	0.093	0.233**	1

**Correlation is significant at the 0.01 level (2-tailed)

Among the 10 associations, 7 associations between the variables are found to be statistically significant at the significant level of 0.01. Therefore, the hypotheses H1, H2, H3, H6, H7, H8 are accepted, whereas H4 and H5 are rejected. The associations of variables of the tables show its correlation range in moderate and weak correlation. Digital piracy behavior scored the highest correlation with neutralization techniques and perceived likelihood of punishment variables with a correlation coefficient of 0.513 ($p<0.01$). Digital piracy behavior also has a weak correlation with perceived benefits and fear of legal consequences. The result is supported by the correlation coefficient of 0.375 and 0.367 respectively.

Further investigation is done to test hypotheses H9 and H10. The findings of the correlation analysis show that the neutralization techniques variable is correlated with the perceived likelihood of punishment with a correlation coefficient of 0.384 ($p>0.01$). The analysis also shows that the neutralization techniques variable is not significantly associated with the moral obligatory variable. Therefore, H9 is rejected whereas H10 is accepted.

4.4 Structural Equation Modeling

Structural Equation Modelling (SEM) is used to analyze structural relationships between variables. The IBM SPSS Amos software is used to compute the result of SEM. The fit indices that are taken into account are Chi-Square Test (X2), Comparative Fit Index (CFI), Normed Fit Index (NFI), Tucker Lewis Index (TLI), Adjusted Goodness of Fit Index (AGFI), and Root Mean Square Error of Approximation (RMSEA). Table 9 displays the value for each of the fit indices in the proposed framework.

Table 9: Fit Indices

Index	Accepted Value	Framework Value
X2	2.0 - 5.0	3.405
CFI	≥ 0.95	1.000
AGFI	≥ 0.90	0.989
TLI	≥ 0.95	1.018
NFI	≥ 0.95	0.995
RMSEA	<0.08	0.000

Table 10 illustrates the output of regression weight for digital piracy behavior from the SEM analysis. The data displayed in the table includes the Estimate value, which is the unstandardized estimates, standard error (S.E.), Critical Ratio (C.R.), and P which indicates the significance value between the variables. At the P column, the three asterisk symbols (***) represent the statistically significant association between the variables, where $P<0.01$. The result shows that majority of the association between the digital piracy behavior and independent variables is significant. However, based on the regression output, H5 that postulates that the perceived benefit variable has an association with digital piracy behavior is rejected, as no significant effect ($p<0.05$) was found based on the regression output. Hence, the association is eliminated from Table 10.

Table 10: Regression Weight

	Estimate	S.E.	C.R.	P
PLP <--- NT	.210	.029	7.137	***
DPB <--- NT	.293	.036	8.051	***
DPB <--- PLP	.447	.078	5.726	***
DPB <--FLC	.480	.070	6.836	***

Based on the estimate value in Table 9, the estimated regression equation is shown as below:

$$DPB = -9.366 + 0.480FLC + 0.447PLP + 0.293NT$$

where:
DPB= Digital Piracy Behavior
FLC = Fear of Legal Consequences
PLP = Perceived Likelihood of Punishment
NT = Neutralization Techniques.

The final Digital Piracy Behavior framework is shown in Figure 2.

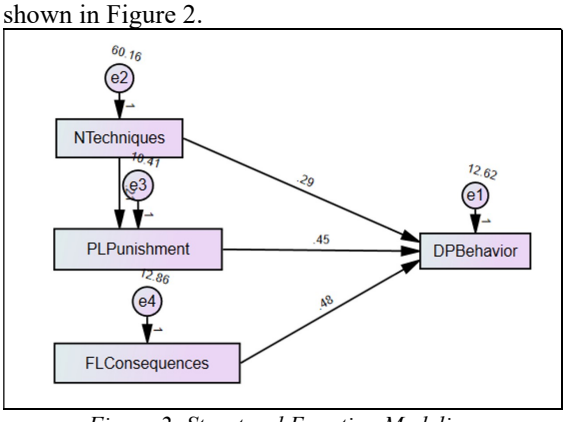

Figure 2: Structural Equation Modeling

5. DISCUSSIONS

During factor analysis, items from all constructs in Neutralization Theory are grouped as one factor. It was found that the items from the

denial of injury, denial of victims, and denial of responsibility variables measure the same thing. The group is named neutralization techniques as the items come from the same theory. The combination of variables under Neutralization Theory as a result of factor analysis seems to be consistent with the study by Wilhelm [24] that combines both denials of injury and denial of victims under one variable, neutralization.

Based on the regression output, further elimination of the perceived benefits variable is done during regression analysis due to its insignificant effect on digital piracy behavior. The findings of this study are consistent with previous studies [2][41] which also found that perceived benefit does not influence student intention towards piracy. While the perceived benefits seem to be in parallel with digital piracy behavior, the students may not specifically consider factors such as price and time savings, productivity, fun time, and socialization when engaging with the digital piracy act [41].

Our findings show that the constructs from Deterrence theory, namely fear of legal consequences has the highest contribution towards digital piracy behavior, followed by perceived likelihood of punishment and neutralization techniques. The findings indicate that laws and punishment can be effective deterrents exercise to regulate digital piracy behavior among multimedia students. Our findings has extended the works by Wilhelm [24] that study examines the effect of neutralization effect (denial of victim and denial of injury) towards multimedia students' intention toward digital piracy,

These findings are supported by the previous study which also finds that the relationships between those variables [22][29][31]. From the aspect of deterrence theory, although the respondents have a higher level of perceived likelihood of punishment and fear of legal consequences, they are also having a high level in response to digital piracy behavior. This might cause by the less severity of the punishment as mentioned in [34].

6. CONCLUSION AND FUTURE WORK

This study aims to identify the factors associated with digital piracy behavior among multimedia students. A proposed theoretical framework which consists of three theories is evaluated. The three theories are Neutralization Theories, Ethics Theory, and Deterrence Theory. Originally, the proposed framework consists of nine variables, which are four independent variables from Neutralization Theory, two independent variables from Ethics Theory and Deterrence Theory respectively, and a dependent variable (digital piracy behavior). Based on the sequential equation modeling, the findings indicate the fear of legal consequences variable has the highest influence on digital piracy behavior, followed by perceived likelihood of punishment and neutralization techniques. This study may benefit other researchers attempting to understand multimedia students' standpoints on digital piracy behavior and increase user awareness in the computer ethics research area.

Some limitations are found in this study include data sampling. The collected demographic data seems to be less useful in this study. This might be due to the insufficient sample size of respondents to obtain a finer output. Therefore, one can argue that the context of this study has introduced bias thus any generalizability to other research settings is limited. Besides, the range in certain demographic criteria such as personal income group is too large. Therefore, future work should seek to expand the sample size to fully represent the population in all demographics aspects.

7. ACKNOWLEDGMENT

Authors are grateful to Universiti Teknikal Malaysia Melaka for the financial support through Universiti Teknologi Malaysia (UTM), Universiti Teknikal Malaysia Melaka (UTeM), Universiti Tenaga Nasional (UNITEN) and Universiti Kuala Lumpur (UniKL) Collaborative Research Grant (PJP/2019/FTMK-CACT/CRG/S01705)

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ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

Table 1: Related Work of Digital Piracy Among University Students

Study	Demographic					Variables												Country
						Theory Planned Behavior			Ethics Theory		Deterrence Theory		Neutralization Theory				Religiosity	
	Gender	Marital Status	Education level	Age	Course taken	Attitudes	Subjective norm	Perceived behavioral control	Moral obligation	Perceived benefits	Fear of legal consequences	Perceived likelihood of punishment	Denial of Injury	Denial of Victim	Denial of Responsibility	Appeal of higher loyalty	Intrinsic Religiosity	
[16]	X			X		X	X											Turkey
[17]	X	X	X	X				X										Malaysia
[18]	X			X				X	X	X								Thailand
[19]	X					X		X	X	X								China
[20]	X					X	X		X									Indonesia
[21]	X		X	X				X		X								Indonesia
[22]	X					X		X				X						Turkey
[6]	X			X		X	X	X	X	X	X	X						Indonesia
[2]	X			X		X		X	X	X	X	X					X	Indonesia
[23]						X		X	X		X	X						Bangladesh
[24]	X			X	X	X	X	X					X	X	X	X		German
[25]	X			X			X	X					X	X	X	X		South Korea