INFLUENCE OF PSYCHOLOGICAL, INTERNET USE AND DEMOGRAPHIC FACTORS ON PATHOLOGICAL INTERNET USE AMONG UNIVERSITY STUDENTS

LU XI

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ABSTRACT

The purpose of this study was to identify the prevalence of Pathological Internet Use (PIU), to test the hypothesized structural model of Pathological Internet Use (PIU) and explore the relationship between cognitive distortion, depression, motivation, loneliness, stressful life events, and PIU. A total of 1493 undergraduate students from Universiti Teknologi Malaysia (UTM) were selected as respondents of this study. The results of this study showed an overall prevalence of PIU was 1.2% and there was no significant difference across groups (Massively multiplayer online role-playing game known as MMORPG, Social Networking Sites known as SNS, and general). The structural model of PIU demonstrated a good fit and all the variables were identified as significant predictors of PIU. Cognitive distortion was identified as the most significant predictor influencing PIU (Beta=0.47, p<0.01), and was confirmed as the most significant mediator between motivation (Beta=0.45, p<0.01), stressful life events (Beta=0.15, p<0.01), depression (Beta=0.39, p<0.01) and PIU. Motivation was found as the second significant predictor directly influencing PIU (Beta=0.35, p<0.01), while stressful life events was the lowest significant predictor directly influencing PIU (Beta=0.10, p<0.01). All the three factors contributed 65% variance of PIU. Besides this, depression was identified as the second significant mediator fully mediating the effect of loneliness on cognitive distortion (Beta=0.71, p<0.01) and partially mediating the effect of stressful life events on cognitive distortion (Beta=0.22, p<0.01). The multi-group analysis was applied to test the moderating effect of Internet use group (MMORPG, SNS, general) on the structural model. The result confirmed the invariance of the structural model across groups. The discussions of results were based on cognitive-behavioral model and previous literatures related PIU. It is recommended to conduct research on pathological Internet use (PIU) among university students as it can identify the status of their Internet use.
ABSTRAK

Tujuan kajian ini adalah untuk mengenal pasti kadar kelaziman Patologi Penggunaan Internet (Pathological Internet Use, PIU), menguji model hipotesis struktur PIU dan meneroka hubungan antara penyimpangan kognitif, kemurungan, motivasi, kesepeian, peristiwa-peristiwa hidup yang tertekan, dan PIU. Sebanyak 1493 pelajar sarjana muda dari Universiti Teknologi Malaysia (UTM) dipilih sebagai responden dalam kajian ini. Dapatan kajian ini menunjukkan kadar kelaziman PIU pada keseluruhannya ialah 1.2% dan tidak terdapat perbezaan yang signifikan antara kumpulan (Massively multiplayer online role-playing game dikenali sebagai MMORPG, Social Networking Sites dikenali sebagai SNS, dan umum). Model struktur PIU didapati sesuai dan semua peboleh ubah dikenal pasti sebagai faktor peramal PIU yang signifikan. Penyimpangan kognitif terbukti sebagai peramal paling signifikan dalam mempengaruhi PIU secara langsung (Beta=0.47, p<0.01), dan dikenal pasti sebagai pengantara paling signifikan antara motivasi (Beta=0.45, p<0.01), peristiwa-peristiwa kehidupan yang tertekan (Beta=0.15, p<0.01), kemurungan (Beta=0.39, p<0.01) dan PIU. Motivasi merupakan peramal kedua signifikan dalam mempengaruhi PIU secara langsung (Beta=0.35, p<0.01), manakala peristiwa-peristiwa kehidupan yang tertekan ialah peramal yang rendah sekali signifikannya dalam mempengaruhi PIU secara langsung (Beta=0.10, p<0.01). Kesemua tiga faktor tersebut menyumbangkan sebanyak 65% varians dalam PIU. Selain itu, kemurungan dikenal pasti sebagai pengantara kedua signifikan yang mengantara sepenuhnya kesan kesepeian terhadap penyimpangan kognitif (Beta=0.71, p<0.01), dan mengantara secara sebahagian kesan peristiwa-peristiwa kehidupan yang tertekan terhadap penyimpangan kognitif (Beta=0.22, p<0.01). Analisis pelbagai kumpulan digunakan untuk menguji kesan moderasi kumpulan pengguna Internet (MMORPG, SNS, umum) terhadap model struktur. Keputusan kajian mengesahkan persamaan dalam model struktural merentas kumpulan. Perbincangan dapatan adalah berdasarkan model kognitif-behavioral dan kajian lepas yang berkaitan dengan PIU. Dicadangkan agar kajian tentang Patologi Penggunaan Internet (PIU) dijalankan dalam kalangan penuntut universiti kerana kajian seperti ini dapat mengenal pasti status penggunaan Internet mereka.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DECLARATION</td>
<td>ii</td>
<td></td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>iii</td>
<td></td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>iv</td>
<td></td>
</tr>
<tr>
<td>ABSTRAK</td>
<td>v</td>
<td></td>
</tr>
<tr>
<td>TABLE OF CONTENT</td>
<td>vi</td>
<td></td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>xiii</td>
<td></td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>xiv</td>
<td></td>
</tr>
<tr>
<td>LIST OF APPENDICES</td>
<td>xvii</td>
<td></td>
</tr>
</tbody>
</table>

1 INTRODUCTION 1

1.1 Introduction 1
1.2 Background of the Study 5
1.3 Statement of the Problem 10
1.4 Research Objectives 12
1.5 Research Questions And Hypothesis 13
1.6 Significance of the Study 15
1.7 Theoretical Framework 16
1.8 Conceptual Framework 21
1.9 Scope of the Study 22
1.10 Limitations of the Study 23
1.11 Definition and Operational definition 23
    1.11.1 Pathological Internet Use 23
    1.11.2 PIU symptom 24
    1.11.3 Massively Multiplayer Online Role-playing
## LITERATURE REVIEW

### 2.1 Introduction

### 2.2 Theoretical Context of the study

#### 2.2.1 Use and Gratification Theory

#### 2.2.2 Davis’s Cognitive-Behavioral Theory

#### 2.2.3 Caplan’s Theory of Problematic Internet use and Psychological Well-being

#### 2.2.4 Neuropsychological Chain Model

#### 2.2.5 Summary of Theories Integration for the Study

### 2.3 Pathological Internet Use

### 2.4 Pathological Internet Use in Malaysia

### 2.5 Pathological Internet Use among University students

### 2.6 Pathological Internet Use and Psychological Factors

#### 2.6.1 Cognitive Distortion

#### 2.6.2 Motivation

#### 2.6.3 Loneliness

#### 2.6.4 Depression

#### 2.6.5 Stressful Life Events

### 2.7 Pathological Internet Use and Internet Use Factors

### 2.8 Pathological Internet Use and Demographic Factors

### 2.9 Massively Multiplayer Online Role-playing game (MMORPG)
2.10 Social Networking Site (SNS) 67
2.11 Summary 70

3 METHODOLOGY 72
3.1 Introduction 72
3.2 Research Framework 72
3.3 Research Design 74
3.4 Research Site 75
3.5 Research Population and Sample 76
3.6 Research Instruments 77
   3.6.1 Section A. Basic Information 77
   3.6.2 Section B. Internet Addiction Test (IAT) 78
   3.6.3 Section C. Inventory of Cognitive Distortion (ICD) 80
   3.6.4 Section D. Motivation of Internet use (M-I) 81
   3.6.5 Section E. Short-form UCLA Loneliness Scale (ULS-8) and Depression of Depression Anxiety Stress Scale -21 (DASS-21) 81
   3.6.6 Section F: Stressful Life Events Scale for university students (SLES-U) 83
3.7 Reliability and Validity of Research Instrument 84
   3.7.1 Content Validity 85
   3.7.2 Construct Validity 85
   3.7.3 Pilot Study 86
   3.7.4 Rasch Model analysis on Item Validity and Reliability 86
      3.7.4.1 Item Analysis using Rasch Model on Internet Addiction Test (IAT) 88
      3.7.4.2 Item Analysis using Rasch Model on Inventory of Cognitive Distortion-S (ICD-S) 89
      3.7.4.3 Item Analysis using Rasch Model on Motivations of Internet use (M-I) 91
3.7.4.4 Item Analysis using Rasch Model on Short-form UCLA Loneliness scale (ULS-8) 92
3.7.4.5 Item Analysis using Rasch Model on Depression subscale of Depression Anxiety Stress Scale-21 (DASS-21-D) 93
3.7.4.6 Item Analysis using Rasch Model on Stressful Life Events Scale for university students (SLES-U) 94
3.8 Data Collection Procedure 96
3.9 Data Analysis 98
3.9.1 Variables 98
3.9.2 Types of Analysis Used 99
3.10 Summary 101

4 DATA ANALYSIS AND FINDINGS 102
4.1 Introduction 102
4.2 Demographic Profile of Research Participants 102
4.3 Factor Analysis 104
4.3.1 Exploratory Factor Analysis for IAT 105
4.3.2 Exploratory Factor Analysis for ICD-S 107
4.3.3 Exploratory Factor Analysis for M-I 109
4.3.4 Exploratory Factor Analysis for ULS-8 111
4.3.5 Exploratory Factor Analysis for DASS-21-D 112
4.3.6 Exploratory Factor Analysis for SLES-U 113
4.4 Findings 115
4.4.1 Research Question 1: What is the prevalence of pathological Internet use (PIU) among university students of Internet use groups (MMORPG, SNS, general and others)? 115
4.4.2 Research Question 2: What is the level of PIU symptoms, cognitive distortion, loneliness, depression and stressful life events on
4.4.3 Research Question 3: Is there any significant difference on the level of PIU symptoms, cognitive distortion, motivation, loneliness, depression and stressful life events among university students of three Internet use groups (MMORPG, SNS and general)?

4.4.4 Research Question 4: Are there significant predictors among psychological, Internet use and demographic factors on PIU symptom for MMORPG users?

4.4.5 Research Question 5: Are there significant predictors among psychological, Internet use and demographic factors on PIU symptom for SNS users?

4.4.6 Research Question 6: Are there significant predictors among psychological, Internet use and demographic factors on PIU symptom for general Internet users?

4.4.7 Research Question 7: What is the goodness of fit of hypothesized model of relationship among PIU symptom, cognitive distortion, motivation, loneliness, depression and stressful life events for the university students?

4.4.8 Research Question 8: Does Internet use groups (MMORPG, SNS and general) moderate the relations between cognitive distortion, motivation, loneliness, depression and stressful life events and PIU symptoms?
SUMMARY, DISCUSSION, CONCLUSION, IMPLICATION AND RECOMMENDATION

5.1 Introduction
5.2 Summary of Overview of the Study
5.3 Summary of Research Findings
  5.3.1 Background Information of Research Samples
  5.3.2 Prevalence of PIU
  5.3.3 Difference on PIU, Cognitive Distortion, Motivation of Internet use, Stressful life Events, Depression and Loneliness across Internet use Groups
  5.3.4 Factors Influencing PIU
  5.3.5 Structural Model of PIU
  5.3.6 Difference on Structural Model of PIU across Internet use Groups
5.4 Discussion
  5.4.1 Prevalence of Pathological Internet Use
  5.4.2 Pathological Internet use, Cognitive Distortion, Motivation of Internet use, Stressful Life Events, Depression and Loneliness across Internet use Groups
  5.4.3 Factors Influencing Pathological Internet use
  5.4.4 Structural Model of Pathological Internet use
  5.4.5 Structural Model of Pathological Internet use across Internet use Groups
5.5 Conclusion
5.6 Implication
  5.6.1 Theoretical Implication
  5.6.2 Practical Implication
5.7 Research contribution
5.8 Reflections
5.9 Recommendation
5.10 Summary
REFERENCES
Appendices A-C
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIGURE NO.</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Hypothesized Structural Model for Conceptual Framework 2</td>
<td>15</td>
</tr>
<tr>
<td>1.2</td>
<td>Theoretical Framework</td>
<td>20</td>
</tr>
<tr>
<td>1.3</td>
<td>Conceptual Framework</td>
<td>22</td>
</tr>
<tr>
<td>3.1</td>
<td>Research Framework</td>
<td>73</td>
</tr>
<tr>
<td>3.2</td>
<td>Data Collection</td>
<td>97</td>
</tr>
<tr>
<td>4.1</td>
<td>Hypothesized Structural Model</td>
<td>143</td>
</tr>
<tr>
<td>4.2</td>
<td>Revised Structural Model</td>
<td>146</td>
</tr>
<tr>
<td>TABLE NO.</td>
<td>TITLE</td>
<td>PAGE</td>
</tr>
<tr>
<td>----------</td>
<td>------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>2.1</td>
<td>Prevalence of Pathological Internet Use in Various Areas</td>
<td>40</td>
</tr>
<tr>
<td>3.1</td>
<td>Item Fit Analysis for Internet Addiction Test (IAT)</td>
<td>88</td>
</tr>
<tr>
<td>3.2</td>
<td>Measured Person for Internet Addiction Test (IAT)</td>
<td>89</td>
</tr>
<tr>
<td>3.3</td>
<td>Measured Item for Internet Addiction Test (IAT)</td>
<td>89</td>
</tr>
<tr>
<td>3.4</td>
<td>Item Fit Analysis for Inventory of Cognitive Distortion-S (ICD-S)</td>
<td>90</td>
</tr>
<tr>
<td>3.5</td>
<td>Measured Person for Inventory of Cognitive Distortion-S (ICD-S)</td>
<td>90</td>
</tr>
<tr>
<td>3.6</td>
<td>Measured Item for Inventory of Cognitive Distortion-S (ICD-S)</td>
<td>90</td>
</tr>
<tr>
<td>3.7</td>
<td>Item Fit Analysis for Motivation of Internet use (M-I)</td>
<td>91</td>
</tr>
<tr>
<td>3.8</td>
<td>Measured Person for Motivation of Internet use (M-I)</td>
<td>91</td>
</tr>
<tr>
<td>3.9</td>
<td>Measured Item for Motivation of Internet use (M-I)</td>
<td>92</td>
</tr>
<tr>
<td>3.10</td>
<td>Item Fit Analysis for Short-form UCLA Loneliness scale (ULS-8)</td>
<td>92</td>
</tr>
<tr>
<td>3.11</td>
<td>Measured Person for Short-form UCLA Loneliness scale (ULS-8) with two item deleted</td>
<td>93</td>
</tr>
<tr>
<td>3.12</td>
<td>Measured Item for Short-form UCLA Loneliness scale (ULS-8) with two item deleted</td>
<td>93</td>
</tr>
<tr>
<td>3.13</td>
<td>Item Fit Analysis for Depression subscale of Depression Anxiety Stress Scale-21 (DASS-21)</td>
<td>94</td>
</tr>
<tr>
<td>3.14</td>
<td>Measured Person for Depression subscale of Depression Anxiety Stress Scale-21 (DASS-21-D)</td>
<td>94</td>
</tr>
<tr>
<td>3.15</td>
<td>Measured Item for Depression subscale of Depression</td>
<td></td>
</tr>
</tbody>
</table>
Anxiety Stress Scale-21 (DASS-21-D) 94

3.16 Item Fit Analysis for Stressful Life Events Scale for university students (SLES-U) 95

3.17 Measured Person for Stressful Life Events Scale for university students (SLES-U) 96

3.18 Measured Item for Stressful Life Events Scale for university students (SLES-U) 96

3.19 Type of Statistical Approach used For Each Question 100

4.1 Demographic Profile of Respondents 103

4.2 Goodness of Fit of EFA on IAT 106

4.3 Factor Loadings, Factor Correlations, Model Fit Indices for EFA on IAT 107

4.4 Goodness of Fit of EFA on ICD-S 108

4.5 Factor Loadings, Factor Correlations, Model Fit Indices for EFA on ICD-S 109

4.6 Goodness of Fit of EFA on M-I 110

4.7 Factor Loadings, Factor Correlations, Model Fit Indices for EFA on M-I 111

4.8 Goodness of Fit of EFA on 6-item of ULS-8 112

4.9 Factor Loading for EFA on 6-item of ULS-8 112

4.10 Goodness of Fit of EFA on DASS-21-D 112

4.11 Factor Loading for EFA on DASS-21-D 113

4.12 Goodness of Fit of EFA on The Stressful Life Events Scale for university students (SLES-U) 114

4.13 Factor Loadings, Factor Correlations, Model Fit Indices for EFA on SLES-U 114

4.14 Internet use group distribution of PIU and non-PIU 116

4.15 Statistical Descriptive of variables across four Internet use group 118

4.16 Skewness and Kurtosis for variables across four Internet use group 120

4.17 Test of Between-Subjects Effects for IAT 121

4.18 Multiple Comparisons on IAT using Gabriel Post Hoc Test 122
4.19 Test of Between-Subjects Effects for ICD-S

4.20 Multiple Comparisons on ICD-S using Gabriel Post Hoc Test

4.21 Test of Between-Subjects Effects for M-I

4.22 Multiple Comparisons on M-I using Gabriel Post Hoc Test

4.23 ANOVA test for ULS-8 and DASS-21-D

4.24 Multiple Comparisons on ULS-8 and DASS-21-D using Gabriel Post Hoc Test

4.25 Correlation Matrix of Dependent Variables and Independent Variables for MMORPG group

4.26 Model Summary of Stepwise Multiple Regression on IAT for MMORPG

4.27 Regression Coefficients for MMORPG

4.28 Correlation Matrix of Dependent Variables and Independent Variables for SNS group

4.29 Model Summary of Stepwise Multiple Regression on IAT for SNS

4.30 Regression Coefficients for SNS

4.31 Correlation Matrix of Dependent Variables and Independent Variables for general group

4.32 Model Summary of Stepwise Multiple Regression on IAT for general group

4.33 Regression Coefficients for general group

4.34 Statistical Descriptive and Normality of Observed Indicators

4.35 Measurement Model Estimates

4.36 Path coefficients of Hypothesized Structure Model

4.37 Fit statistics Comparison between hypothesized and revised model

4.38 Path coefficients of Revised Structure Model

4.39 Baseline models across Internet use groups

4.40 Test for multi-group analysis across MMORPG, SNS and general groups
### LIST OF APPENDICES

<table>
<thead>
<tr>
<th>APPENDIX</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Questionnaire</td>
<td>211</td>
</tr>
<tr>
<td>B</td>
<td>List of Publication Related to Thesis Work</td>
<td>219</td>
</tr>
<tr>
<td>C</td>
<td>Letter of Assisting Data Collection</td>
<td>220</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

1.1 Introduction

The advent of Internet and its applications have changed the world and people’s daily lives. It has become more important in various aspects, such as work, study, and entertainment. As increasing number of Internet applications have been created, and with its easy accessibility, people spend more time online, ranged from 19 to 68 hours per week (Li, Wang and Wang, 2009; Hardie and Tee, 2007). Besides its benefits on academic, economic, and social aspects, the negative consequences of long-time Internet use were highlighted in numerous previous research, such as declined academic achievement (Soule, Shell and Kleen, 2003; Kubey, Lavin and Barrows, 2001; Chou and Hsiao, 2000), interpersonal relationship with others (Chou and Hsiao, 2000) and physical health problems (Kim and Chun, 2005).

Griffiths (1998, p. 73) indicated that “excessive use of the Internet may not be problematic in most cases but the limited case study evidence suggests that for some individuals, excessive Internet use is a real addiction and of genuine concern”. The term to describe those people is not consistent, which include “Pathological Internet use, Internet Addiction Disorder, Internet addiction, Internet addicts, Problematic Internet use, computer-mediated communication addicts, computer junkies, maladaptive patterns of Internet use, etc.” (Caplan, 2002; Davis, 2001; Beard and Wolf, 2001; Chou, Chou and Tyan, 1999; Goldberg, 1996; Young, 1998). This research adopts the term “Pathological Internet use” (PIU) which refers to the
excessive use of Internet and significantly influences one’s normal life including psychological, family, and social problems (Beard and Wolf, 2001; Davis, 2001).

The word “pathological” which has been used in The Diagnostic and Statistical Manual of Mental Disorders IV (DSM IV) of “pathological gambling” to describe individuals who have persistent maladaptive patterns of gambling behaviors despite the negative consequences was adapted into eight criteria by Young (1998) to assess maladaptive Internet use. Davis (2001) pointed that although the Internet addiction has been widely used, “addiction” in the literature was usually used to describe a physiological dependence between a person and some stimulus, usually a substance. The DSM-IV uses terms “dependence” (for substances) and “pathological” (for gambling disorders) instead the word “addiction” to describe pathological use of a substance or other such stimulus. Although DSM IV has not yet included the diagnosis of pathological Internet use or Internet addiction, the behavior and cognitive symptoms, as well as the abnormal brain function and lateral activation of the right brain was detected among the students with pathological Internet use (Du, Liu, Gao, Li, Li, Li, Zhang and Zhou, 2011; Meerkerk, Van den Eijnden, Vermulst and Garretsen, 2009; Caplan, 2002; Davis, 2001; Young, 1998).

The prevalence data varies across countries due to different criteria used to determine the prevalence. In Korea, it was 3.5% by using modified Young’s Internet Addiction Scale (Whang, Lee and Chang, 2003) and 10.7% by using Internet Addiction Scale (Park, Kim, and Cho, 2008). Canbaz, Tevfik Sunter, Peksen and Canbaz (2009) identified 1.2% of Internet addicts (IAs) and 19.9% of possible Internet addicts (PAs) in Turkey based on Young’s Internet Addiction Scale. Netherlands reported a prevalence of 0.9% measured by the Compulsive Internet Use Scale (Meerkerk, 2007). A study in Malaysia identified 43% of samples as Internet dependence by Young’s Diagnostic Questionnaire (Ng, Isa, Hashim, Pillai and Harbajan Singh, 2012).

As the number of Internet user increased rapidly (usage rate increased 528.1% from 2000 to 2011) (Internet Usage World Stats, 2011), more and more people will be at the risk of developing pathological Internet use. In light of this, the increasing population and negative consequences of addiction or pathological Internet use
should not be neglected. Continuous research should be carried out to study the prevalence of pathological Internet use among Internet users and detect the characteristics of people who are vulnerable to develop pathological Internet use, as well as formulating interventions. Findings from these researches could offer useful information to help people under pathological Internet use and also provide the theoretical knowledge for the psychological counsellor to apply the appropriate intervention and counselling plan.

Some special Internet activities were found to be more attractive and addictive, such as the online game, social networking, chatting (Van Rooij, Schoenmakers, Van de Eijnden and Van de Mheen, 2010; Grüsser, Thalemann and Griffiths, 2007; Meerkerk, Van den Eijnden and Van Rooij, 2006). They were found to be associated with compulsive Internet use or pathological Internet use while social function was deemed as a special attractive trait of Internet (Chou and Hsiao, 2000; Ju, 2000). The strongest negative correlation between online game and social network provided the sign of competition between these two Internet applications, which further implied that individuals who were indulged in on online games would spend less time or no time on social network, while individual fascinated on social network would spend less or no time on online games (Van Rooij et al., 2010). Therefore, the Internet users who preferred these two online activities may have different characteristics, such as gender, motivation. Male students were reported with higher rates of playing online multi-user games, while female students reported higher rates of social networking (Durkee, Kaess, Carli, Parzer, Wasserman, Floderus, Apter, Balazs, Barzilay, Bobes, Brunner, Corcoran, Cosman, Cotter, Despalins, Graber, Guillemin, Haring, Kahn, Mandelli, Marusic, Mészáros, Musa, Postuvan, Resch, Saiz, Sisask, Varnik, Sarchiapone, Hoven and Wasserman, 2012).

Online gaming, such as massively multiplayer role-playing game (MMORPG) (i.e. World of Warcraft) was found to be most significantly associated with pathological Internet use (Van Rooij et al., 2010; Ducheneaut and Moore, 2004). Although the partial reinforcement effect (PRE) is the critical psychological component of gaming addiction, the MMORPG obtain the unique advantages from Internet compared to traditional games. The Internet provides a virtual context for gamers to build their own virtual organizations. The online social interaction is an
important element to play the game with their group members. Another new Internet application, social networking site (SNS) (i.e. facebook.com, xiaonei.com) makes up a new pattern of pathological Internet use. Although there is limited research on this topic, the negative influences on users’ social and psychological function were detected (Daria, Kuss and Griffiths, 2011; Spraggins, 2009).

Both of these Internet applications – MMORPG and SNS have huge number of users and the amount is increasing with high speed (Young and Nabuco de Abreu, 2011; The Nielsen Company, 2009). They were always chosen as the most popular Internet application (Durkee et al, 2012; Kim, LaRose, and Peng, 2009; Yen, Ko, Yen, Wu, and Yang, 2007; Whang, Lee and Chang, 2003), which have some similarities related to Internet unique traits, such as virtual environment, remote social interaction, but they are totally different in content and function. Students who are attracted by these two Internet applications may be different in some aspects, such as motivation and gender. And those students who pathologically use these two applications may also share some similar characteristics, such as loneliness and cognitive distortion. Research compared these two Internet application is limited. This research intended to identify the prevalence of pathological Internet use (PIU), as well as the psychological, Internet use and demographic factors related to the PIU among MMORPG and SNS users respectively.

University students are deemed as one of the most vulnerable group to develop PIU ranged from 13% to 18.4% (Young and Nabuco de Abreu, 2011; Anderson, 2001; Hall and Parsons, 2001), which is usually higher than others (Young and Nabuco de Abreu, 2011). A pilot study in Universiti Teknologi Malaysia (UTM) among 90 undergraduate students identified 12 cases of PIU and students with PIU spent longer time (7.58±1.93h) on Internet than non-PIU (5.21±1.93h) (Lu and Yeo, 2013). Ling, Ramadass, Altaher and Arjuman (2011) identified 58 persons (29%) at the risk of PIU among 203 Malaysians and further suggested that individual at the age of 18 to 25 were more vulnerable to get PIU, especially students in universities or colleges. As they are more free and easier to access Internet, as well as have more rational reason in environment. On the other hand, they are psychologically at the stage from dependent to independent, which could bring various challenges, such as developing various interpersonal relationships (e.g.
romantic relationship) and ability (e.g. academic work, vocational skills). But some of the psychological aspects are still in development, such as self-regulation, emotional management. They may experience difficulties to cope with attractive Internet application and regulate their Internet use, which may lead to PIU (Frangos, Frangos, and Kiohos, 2010; Young, 2004).

Internet usage and its potential influence (Kaltiala-Heino, Lintonen and Rimpela, 2004; Kubey, Lavin and Barrows, 2001; Morahan-Martin and Schumacher, 2000) on the vulnerable group (students) have been well studied in many countries but little information could be obtained in Malaysia. Therefore, continuous research on this area should be conducted to enhance the current empirical research in Malaysia.

### 1.2 Background of the Study

The widespread use of Internet affects various aspects of society and people all over the world, such as communication, study, work, business, and shopping. It provides a global data communications system between computers, which bring many advantages such as faster communication, information resources, entertainment, social networking, and make life convenient and efficient. There are approximately 2.27 billion Internet users all over the world in 2011. The growth rate is 528.1% from 2000 to 2011. Asia takes the biggest population, more than one billion, followed by Europe and North America (Internet World Stats, 2011). As the technology advanced and multiple applications emerged, people are attracted and even obsessed with Internet. Previous research including review studies, pointed out that some people may develop abnormal Internet dependence, which present the similar symptoms as substance addiction, such as obsessive thoughts of Internet, tolerance, diminished impulse control, inability to cease using the Internet, and withdraw (Laura Widyanto and Mark Griffiths, 2006; Chou, Condron and Belland, 2005; Davis, 2001, Young, 1998).

The various adverse consequences of abnormal Internet use and PIU were
found by most past researches, such as negative influence on students’ daily routines, school performance, teacher and parental relation (Yang and Tung, 2007), poor health status (Kim and Chun, 2005), weak sense of time management, as well as behavioral and emotional problems (Cao and Su, 2007). The students may further get poor academic performance, psychological and physical problems (Cao and Su, 2007; Cao, Su, Liu and Gao, 2007).

There is no single standard instrument and criterion for the pathological Internet use, and the prevalence report varies widely across cultures and countries. Young and Nabuco de Abreu (2011) summarized the data from past researches and concluded that there were 6% to 15% of the general population are at the high risk for PIU. The report of PIU among students in Asian countries indicated fairly high excessive Internet use. Chou and Hsiao (2000) collected 910 valid responses from 12 Universities and Colleges in Taiwan and reported that a total of 13.7% of students were Internet addicts based on Young’s Diagnostic Questionnaire (YDQ). In Mainland China, a study used the same instrument found 4.6% Internet addicts among 433 college students (Mei, Ge, Kou, Zhang, Chen and Yu, 2008). Li, Wang and Wang (2009) used Chinese version of GPIU scale to measure the generalized problematic Internet (GPIU) among College students which reported a prevalence of 13.6%. The prevalence of GPIU did not vary across gender, grade or major. Hechanova and Czincz (2008) reported that there were approximately 12% of Asian youth are at risk of being PIU based on the studies in Asian area: Mainland China, Hongkong, Taiwan and Korea. This study also found a higher rate of prevalence among university students compared to others.

In Malaysia, the proportion of individuals at the risk of PIU was reported in some researches, but most of them investigated a small sample size. The result is also varied widely due to the inconsistent definition, sample, and method. For examples, Yong (2011) used Internet Addiction Test (IAT) and identified 4 students (3.333%) as excessive user among 120 students in Sekolah Menengah Kebangsaan Jenis Pei Yuan Kampar, Perak. Ling, Ramadass, Althar and Arjuman (2011) found 29% of PIU in a sample of 203 Malaysian by using Internet Addiction Test (IAT). Another study detected 43% of cases as Internet dependence in a sample of 162 students by Young’s Diagnostic Questionnaire (YDQ) (Ng, Isa, Hashim, Pillai and Singh, 2012).
As mentioned above, the big scale investigation on Malaysian university students is limited. Furthermore, there is no research to examine the psychological deficits among different Internet application users (MMORPG and SNS). This research was conducted in a public university, Universiti Teknologi Malaysia (UTM) with a big scale investigation in order to examine the prevalence of pathological Internet use (PIU) in UTM, and find out the psychological vulnerabilities of MMORPG and SNS users who may tend to develop PIU. As UTM is one of the prestigious research universities and could be good representative of public university, where Internet was widely used and provided in campus (e.g. library, college, lecture room) as it is necessary in student learning (e.g. E-learning).

According to Davis’s (2001) cognitive-behavioral theory of PIU, the maladaptive cognition or cognitive distortion is deemed as the proximal sufficient cause of PIU, which exist before the maladaptive behavior on Internet use. The psychopathology (e.g. depression, loneliness) is the distal necessary cause of PIU. This theory explained the development of PIU in cognitive-behavioral perspective and was supported by the following research which found that cognitive distortion was the important factor lead to PIU (Caplan, 2003; Kim, LaRose and Peng, 2009) and further developed instruments (OCS: Online Cognition Scale and GIPU: Generalized Problematic Internet Use Scale) to examine the cognitive symptoms of PIU (Davis, Flett and Besser, 2002; Caplan, 2010). The influence of psychopathology such as loneliness and stress was also confirmed (Harn, Wu, Chen and Chang, 2007; Kim, LaRose and Peng, 2009), but the effect of depression on PIU was not consistent in different countries (Yen, Ko, Yen, Wu, and Yang, 2007; Harn, Wu, Chen and Chang, 2007; Lu, Watanabe, Liu, Uji, Shono, and Kitamura, 2011).

The theory of Davis (2001) and Caplan (2002) highlighted the effect of cognitive distortion and the social function of Internet on the development of PIU, but ignored the effect of individual’s motivation on the selection of Internet application. Currently, study found that individual was fascinated on some Internet applications (e.g. Facebook, World of War craft), not others (Van Rooij, Schoenmakers, Van de Eijnden and Van de Mheen, 2010; Grüsser, Thalemann and Griffiths, 2007; Meerkerk, Van den Eijnden and Van Rooij, 2006). Kuss and Griffiths (2011) found that the motivations related to dysfunctional coping,
socialization and personal satisfaction were the risk factors for PIU of online game users. While, the most frequent motivation for SNS users was keeping in touch with friends (Kujath, 2011). This study assumed the motivation as the important factor on the selection of Internet application which could show the different picture of PIU with different Internet application and further compensate the gap of current theory and realistic situation.

Van Rooij et al. (2010) explained that “the multiplayer online games can be played with other gamers. As a result, networks of relationships with other gamers become very important. Some games, such as First Person Shooters (FPS), are played in temporary environments, whereas Massive Multiplayer Online Role Playing Game (MMORPGs) utilize a persistent world that continues even if the gamer is absent.” “World of Warcraft” as one of the most famous massively multiplayer online role playing game (MMORPG), has developed over ten million members worldwide since 2004 (Blizzard Entertainment, 2008). Others are "Ever Quest", “Lineage”, "Ragnarok Online", etc. It provides a persistent virtual world. Players may resume the role of one or more characters in the game and play with other members online to adventure in their virtual world. The different characters in this game usually take different responsibilities in a group and complete tasks with other characters, such as tank, healer in World of Warcraft. The type of characters determines the type of weapon and armor can be used, as well as the ability, powers and skills gained. As the gaming experiences accelerate, the characters could advance to the next higher level, which could gain weapons and values, become healthier and wealthier.

In addition, those games are never-ending and time consuming. It is impossible for players to complete all the tasks as the new content come continuously which draws them back to play the games. Social interaction online in MMORPG is used for the players to collaborate with others and cooperate to succeed in task. Those games do not only have the traits as the traditional ones, but also develop other attractive traits through Internet platform (Ng and Wiemer-Hastings, 2005). Preference of a virtual life was found as a predictor for PIU with MMORPG, which implied that the virtual world online is a special traits which attracted people (Liu and Peng, 2009). Therefore, many researchers look at virtual world games to be
more addictive than other games (Council on Science and Public Health, 2007; Lee, Ko, Song, Kwon, Lee, Nam and Jung, 2007; Chappell, Eatough, Davies and Griffiths, 2006). A study compared MMORPG players with video game players found that most of MMORPG players (11-40 hours) played much longer than non-MMORPG players (1-6 hours). They sacrificed their sleep time, had more fun and felt more pleasant with in-game friends than friends in real life (Ng and Wiemer-Hastings, 2005).

While MMORPG have many members, another Internet attraction for many Internet users is the Social Networking Site (SNS), such as Facebook and MySpace. SNS provides virtual communities where users can create and design their personal profile, interact with real-life friends, meet and add other users (Daria, Kuss and Griffiths, 2011). SNS was defined as “web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system” (Boyd and Ellison, 2008). Facebook as one of the most popular sites has over 500 million users worldwide and 50% of the users log on to it every day (The Nielsen Company, 2009). The SNS contains almost all the ingredients of other Internet application, such as chatting, post message and pictures, blog, games (happy farm), email. SNS users could make up their profile, search and add friends, according to their interests, as well as visit their friends’ profile, post comment.

Wise, Alhabash and Park (2010) used skin conductance and facial electromyography to study the emotional responses during social information seeking on Facebook, which found that people felt more pleasurable on social searching, such as extracting information from friends’ profiles, compared with social browsing. It implied that the appetitive system may be aroused by goal-directed activity of social searching which is related to pleasurable experience (Lang, Potter, Bolls, 2009). This was also found on Internet game over users and addicts (Park, Kim, Bang, Yoon, Cho and Kim, 2010; Ko, Liu, Hsiao, Yen, Yang, Lin, Yen and Chen, 2009). Echeburua and de Corral (2010) pointed that the symptoms on people who pathologically obsessed on SNS, are similar to people with substances or other behaviors addictions. As its huge population and complex functions,
researchers stressed the necessities and importance of more researches on this new Internet application (Daria, Kuss and Griffiths, 2011; Echeburua and de Corral, 2010).

As mentioned above, MMORPG and SNS both have a huge number of users, provide virtual environment and online social interaction based on Internet platform, researches to examine the users belong to these two Internet applications is limited. Therefore, a study specifically examined these two Internet use groups should be encouraged to complement more empirical information on this filed and fill the gap of current cognitive-behavioral theory and its application to reality, which could help to detect the characteristics of the vulnerable population regarding to these two applications and provide clues for intervention.

1.3 Statement of the Problem

Internet has become the ideal means of providing information to students and more importantly it is enjoyable due to the interactivity it provides. Students have the freedom of doing anything: to research and learn any topics, chatting, gaming, shopping and much more. One of the questions often arise is pathological Internet use (PIU) which refers to excessive Internet use with inability to control the impulse of Internet use, while various negative consequences turned up.

Researchers considered the university students as the most vulnerable population to be pathological Internet users based on past prevalence report in many countries (Young and Nabuco de Abreu, 2011; Hechanova and Czinzcz, 2008). A study in Malaysia also found the students in university or college were more vulnerable and got a higher prevalence of PIU (29%) (Ling, Ramadass Altaher and Arjuman, 2011).

As mentioned above, the research on PIU in Malaysia was just in the beginning and still lacking in many areas. Researches on university students were limited and restricted in the sample size and methodological design. Due to the
different characteristics of university students on various aspects, such as gender, the preferred Internet application, educational background, and psychological status, the tendency and possibility of PIU should be varied. Research to examine the effect of those factors on PIU is limited in Malaysia and the result is inconsistent in overseas.

Some previous research found that MMORPG users spent longer time compared to other non-MMORPG users (Ng and Wiemer-Hastings, 2005) and experienced higher level of loneliness (Parsons, 2005), while some did not find the influence of loneliness and depression on PIU among MMORPG users. But loneliness was positively related to PIU among SNS users (Wan, 2009; Spraggins, 2009). Both Massively multiplayer online role-playing game (MMORPG) and social networking site (SNS) are most popular Internet applications having huge number of users. They provide service worldwide via the Internet platform. Both of them use Internet unique traits to develop virtual community to interact and communicate with other users from different areas. They have shared some similarities via Internet, but the content and intention of them are totally different. MMORPG is a one kind of online games, which is mainly for entertainment; while, SNS is a kind of website for people to interact with other friends, which could be used for study, work, and entertainment.

It is unclear whether the MMORPG and SNS users with PIU have the same psychological vulnerabilities (e.g. stress, depression, loneliness) or not. Most previous research studied these two applications separately or compared with the offline activities. There is no such research to examine the PIU of MMORPG and SNS users in a same context either in Malaysia or overseas. This research studied the effect of motivation on Internet application selection based on the theory of Davis (2001) and Caplan (2002) to examine the relationship among psychological factors (cognitive distortion, motivation, depression, loneliness, stressful life events) in influencing PIU symptoms.
1.4 Research Objectives

The main objective of this study is to identify the prevalence of pathological Internet use and PIU (pathological Internet use) symptoms among university students of three Internet use groups (MMORPG, SNS and general Internet users) in Universiti Teknologi Malaysia (UTM); to examine the influences of psychological factors, Internet use factors and demographic factors to PIU among university students of three Internet use groups (MMORPG, SNS and general Internet users). Internet use factors include average number of hours cost on Internet per day and years of Internet use experience. Demographic factors include gender, major, grade and race.

Based on the main objective of the study, the following objectives are set as follows:

1. To identify the prevalence of pathological Internet use (PIU) among university students of three Internet use groups (MMORPG, SNS and general).

2. To identify the level of PIU symptom, cognitive distortion, motivation, loneliness, depression and stressful life events among university students of three Internet use groups (MMORPG, SNS and general).

3. To identify the difference on the level of PIU symptom, cognitive distortion, motivation, loneliness, depression and stressful life events between Internet use groups (MMORPG, SNS, and general) among university students.

4. To identify the important factors influencing the level of PIU symptoms among university students of three Internet use groups (MMORPG, SNS and general).

5. To identify the goodness of fit of a hypothesized model of relationship among PIU symptom, cognitive distortion, motivation, loneliness, depression and
stressful life events among university students for three Internet use groups (MMORPG, SNS and general) (Fig. 1.1).

1.5 Research Questions and Hypothesis

Based on the objectives, the following research questions are addressed:

Question 1:
What is the prevalence of pathological Internet use (PIU) among university students of three Internet use groups (MMORPG, SNS and general)?

Question 2:
What is the level of PIU symptom, cognitive distortion, motivation, loneliness, depression and stressful life events among university students of three Internet use groups (MMORPG, SNS, general and others)?

Question 3:
Is there any significant difference on the level of PIU symptom, cognitive distortion, motivation, loneliness, depression and stressful life events among university students of three Internet use groups (MMORPG, SNS and general)?

Question 4:
Are there significant predictors among psychological, Internet use and demographic factors on PIU symptom for MMORPG users?

Question 5:
Are there significant predictors among psychological, Internet use and demographic factors on PIU symptom for SNS users?
Question 6:
Are there significant predictors among psychological, Internet use and demographic factors on PIU symptom for general users?

Question 7:
What is the goodness of fit of hypothesized model of relationship among PIU symptom, cognitive distortion, motivation, loneliness, depression and stressful life events for the university students? (Fig. 1.1)

Question 8:
Does Internet use groups (MMORPG, SNS and general) moderate the relations between cognitive distortion, motivation, loneliness, depression and stressful life events and PIU symptom

Based on the research questions above, the null hypotheses for the study are formulated as follows:

Null hypothesis 1 for question 3:
$H_01$: There is no significant difference on the level of PIU symptom, cognitive distortion, motivation, loneliness, depression and stressful life events across three Internet use groups (MMORPG, SNS and general).

Null hypothesis 2 for question 4:
$H_02$: There is no significant predictor among psychological, Internet use and demographic factors on PIU symptom for MMORPG users.

Null hypothesis 3 for question 5:
$H_03$: There is no significant predictor among psychological, Internet use and demographic factors on PIU symptom for SNS users.

Null hypothesis 4 for question 6:
$H_04$: There is no significant predictor among psychological, Internet use and demographic factors on PIU symptom for general users.
Null hypothesis 5 for question 8:

\( H_05: \) There is no significant moderate effect of Internet use groups in the relationship of cognitive distortion, motivation, loneliness, depression and stressful life events and PIU symptom.

![Hypothesized Structural Model for Conceptual Framework 2](image)

**Figure 1.1 Hypothesized Structural Model for Conceptual Framework 2**

### 1.6 Significance of the Study

This study provides an insight for a better understanding on the behavioral and cognitive aspects of individual with pathological Internet use, how the psychological factors (e.g. motivation, depression), Internet use factors (e.g. years experiences on Internet), and demographic factors (e.g. gender, major) are related to the pathological Internet use (PIU). Furthermore, this study took the undergraduate students in Universiti Teknologi Malaysia (UTM) as its research population, which intended to conduct a big scale survey on this vulnerable population to identify its prevalence of PIU. It provides information on problems of Internet use among university students, which could arouse the consciousness of Universities and The Ministry of Education Malaysia to pay attention on students with PIU or at the risk of PIU. The vulnerabilities of students with PIU detected in this study will help the educators and parents to identify students who are more likely to become PIU in
early stage, so that appropriate measure such as advise or cognitive intervention can be provided to these students.

In addition, examine the motivation of students using different Internet applications and its relationship of psychological factors (cognitive distortion, motivation, depression, loneliness, stressful life events) in influencing PIU, which could give a clear picture of students’ Internet usage on MMORPG and SNS, identify the commonalities and differences of psychological vulnerabilities of PIU for MMORPG and SNS users. The different content and attractions between these two Internet applications fascinate students with different characteristics, such as psychological status, major, gender. This study presents the similarities of PIU on MMORPG and SNS for educators and counselors to better understand on psychological aspects of students with PIU and its risk factors; identify the differences on MMORPG and SNS users to better understand the specific psychological vulnerabilities related to PIU for MMORPG and SNS users for the educators and counselors to treat them differently.

Furthermore, the findings of this study do not only add to the richness of research data in this field, but also provide empirical evidence and theoretical clues of psychological aspects of students with PIU which could benefit the research on therapies and intervention regarding to PIU, and push the progress of efficient treatment. It also provides a baseline and theoretical evidence for the Universities and Ministry of Education Malaysia to develop related assessment or instrument in order to identify the students at risk of PIU and make further support action for those students. The systematic guideline of healthy Internet use for the university students will be suggested for the Ministry of Education.

1.7 Theoretical Framework

Not every Internet user is at risk for pathological Internet use. Individuals respond to Internet applications differently based on their own psychological and social traits. Although the criterion to define pathological Internet use or Internet
addiction is complex and inconsistent in academic research, some specific performance on this population have been confirmed and supported by most researches, such as loss of impulse control to become unmanageable for Internet, spend extremely long time on Internet which influence their normal daily activates, psychological and social negative consequence with excessive use of Internet (Young and Nabuco de Abreu, 2011). Starting from Young’s first research on heavy Internet user, researchers dedicated on the Internet related research have proposed various theories based on different perspectives (Young and Nabuco de Abreu, 2011). The theoretical work on the pathological Internet use is still ongoing and encouraged. This study was conducted based on theories illustrated below.

The first theory introduced in this study is Use and Gratification theory. It was firstly proposed to explain the function of mass media and the media users’ behavior in 1940s (Young and Nabuco de Abreu, 2011). The basic premises of this theory are that media users are active in their selection of media content and make deliberate choices among the media alternatives available to them based on their needs. In other words, media users choose different media to meet their specific needs and goals. Katz, Blumler and Gurevitch (1974) in their research on use and gratification assumed that individual use media based on their needs and motives, their following media use is reinforced by the obtained gratifications. “Gratification sought” and “gratification obtained” are typical concern of this theory. Gratification sought is refer to the various motivations based on expectations, which predict the media consumption; while the gratification obtained the perceived gratification level related to the media use behavior. The sense of satisfaction or gratification obtained on media use is the critical factor on continuous use of any media. If the users perceive that their motives are satisfied by the media, they are more likely to continue on using it. If not, they may seek for an alternative one. This theory has been frequently applied to the Internet use behavior currently (Young and Nabuco de Abreu, 2011).

Davis (2001) proposed a cognitive-behavioral model of pathological Internet use (PIU), which considered that beside the maladaptive behavioral, the problematic cognition as an important component related to the maladaptive response on Internet. It emphasized that the main source of the abnormal Internet use was the individual’s
thoughts or cognitions. One of the most important components of this model is the
maladaptive cognitions which are the proximal causes and are sufficient to cause
symptoms of PIU. There are two types of maladaptive thoughts: thoughts of self and
the world. While, the distal necessary cause of PIU is the psychopathologies, such as
depression and social anxiety. The Cognitive-Behavioral Model assumes that the
original psychopathology will make the individual more vulnerable to developing
symptoms of PIU. The exposure to Internet (e.g. online auction service, online stock
trading, chatting) is considered as the stressor in this model, which is also a distal
necessary cause of PIU. The experiences with these Internet applications do not
cause the symptoms of PIU, but is a contributory factor in the process of PIU. The
reinforcement received from the Internet use is another key factor on individual’s
continuing Internet use. If the individual gets a positive experience with Internet, he
or she is reinforced to reuse it.

Based on Davis’ model, Caplan (2003) further proposed a theory of
Problematic Internet use and Psychosocial Well-being, which regard that the
psychosocial problems lead the problematic use of Internet. And the problematic use
of Internet may in turn worsen their original psychosocial problems. There are three
propositions in this theory. First, it proposed that individual with psychosocial
problems such as depression and loneliness have more negative perceptions on their
social competence than others; second, as these individuals get more efficacious and
feel less threatening via online interaction with others, they tend to develop a
preference for online social interaction rather than face to face communication; third,
this preference would lead to excessive and compulsive use of computer-mediated
interactions, which, in turn worsen their problems and create new ones at school,
work and home. This theory considers the preference for online social interaction as
a key contributor to the development of pathological Internet use.

The last theory introduced in this study is from the China Youth Association
for Network Development (CYAND, 2005), which proposed a neuropsychological
chain model of pathological Internet use. The primitive drive include various motives
and impulses (pursue pleasure and avoid pain) to use Internet. The central nervous
system is stimulated (e.g. increase of dopamine) by the Internet use, which produce
the feeling to continuously use the Internet and extend euphoria. The euphoric
experience will soon be transformed into a habit and numbness state once addiction is formed. As the sensory threshold increases with the repeated Internet use, the user must increase the time and passion in order to achieve the same happy experience as the first time, which leads to high level of tolerance. Once the individual tries to control the Internet use such as stops or decrease the Internet use, the physical and psychological syndromes appear, such as emotional instability, irritability, dysphoria. The passive coping style is formed once the individual is faced with frustration or harmful effects, which include passive behaviors such as adverse event imputation, cognition falsification. The avalanche effect will happen at last, which includes passive experience consisting of tolerance and abstinence reaction, and combined drive consisting of individual passive coping styles on the basis of the primitive drive of the individual (Young and Nabuco de Abreu, 2011). According to this theory, the increasing time spent on Internet is the result of PIU which is aimed to achieve the previous happy experience.

Davis’s theory deemed cognitive distortion as the proximal cause of PIU which was set as a mediator in this study. The psychopathology (e.g. depression, stress) were the distal factors influencing PIU through cognitive distortion in Davis’s theory. Caplan upgraded Davis’s theory and suggested that lonely people were more likely to develop preference for online social interaction (POSI) and become PIU. In this study, some psychopathologies (e.g. loneliness, depression) were selected as the independent variable directly or indirectly influencing PIU through cognitive distortion. Use and gratification theory explained the relationship between motivation and Internet application selection and viewed motivation as the critical factor of continuous use of Internet. Thus this study added motivation based on Davis’s cognitive-behavioral theory, which was assumed to influence PIU directly or indirectly through cognitive distortion. With all the potential variables proposed by the three theories above, the Neuropsychological Chain Model deemed that individual develop PIU concurrent with the accelerate of Internet use (e.g. time spent online) which was set as the Internet use factors in this study.

Davis’s theory provides a model of etiology, development, and outcomes related to pathological Internet use, which deemed the maladaptive cognition as the key factor facilitate the pathological Internet use. Other contributors, such as
psychopathology, Internet, have also been included in this model. Caplan’s theory illustrated the relationship of psychosocial well-being and PIU, which provided another psychological factors (e.g. loneliness and depression) influencing PIU. The theory proposed by the China Youth Association for Network development (CYAND), explained the PIU on the neuropsychological perspective.

Based on all the theories above, this study generated a theoretical framework based on Davis’s cognitive-behavioral model, ideas from Caplan’s, and also support Use and Gratification theory and neuropsychological theory (Figure 1.2). The study proposed that the pathological Internet use was influenced by various psychological factors (e.g. motivation, loneliness), Internet use factors (e.g. number of hours cost on Internet), demographic factors (e.g. gender)

![Figure 1.2 Theoretical Framework](image-url)
1.8 Conceptual Framework

Not every Internet use will develop to be a pathological Internet user. Individual uses Internet differently based on their psychological status, background and social environment. Most of those factors have been well studied and confirmed by previous researches. This study proposed conceptual frameworks based on the past literatures and theoretical framework described above, as well as the research objectives (Fig. 1.3).

As shown in Fig.1.3, this study had proposed multiple independent variables from three aspects deemed important to pathological Internet use, which are psychological factors, Internet use factors and demographic factors. The psychological factors include cognitive distortion, motivation, loneliness, depression and stressful life events. Internet use factors include average number of hours cost on Internet per day and years of Internet use experience. Demographic factors include gender, major, grade and race. The effect of those variables were described in Chapter two.

There are numerous Internet applications including email, instant-message, games, social networking site, etc. Individual may use them simultaneously in one day according to their interests and needs. But some of them develop a preference on some special Internet application, who use it regularly and with long time, such as games and social networking site. This study divided responders into three groups (MMORPG, SNS, general users) according to their self-report on preference Internet application and time cost on the Internet application (Fig. 1.3), which is aimed to find out the differences between MMORPG and SNS users, as well as the relationship with pathological Internet use.

The level of pathological Internet use (PIU) symptoms is the dependent variables in this study, which may be influenced by various independent variables mentioned above. Another focus of this study is to explore the level of PIU symptoms among three groups (MMORPG, SNS, general users) and the relationship among cognitive distortion, motivation, loneliness, depression, and stressful life events in influencing PIU (Fig. 1.1).
1.9 Scope of the Study

This study explored the Internet use among university students in Universiti Teknologi Malaysia (UTM). Besides the prevalence of pathological Internet use, the researcher was interested in detecting the vulnerabilities of university students on pathological Internet use, such as cognitive distortions, stressful life events. The effect of different Internet application on Internet users is another interest, so this study also concentrates comparing three Internet use groups (MMORPG, SNS, general users).

This study focuses on the level of PIU symptoms among university students in UTM. The data are responses from the students’ self-report questionnaires. In order to do the large scale survey, the study has to get at least 600 validate respondents. The researcher collected data using pencil-paper questionnaire.
1.10 Limitations of the Study

The study relied mainly on the self-report from university students which may not be objective in some aspects due to the different personality, value system and response style. The students with PIU or excessive Internet use may hide some of their behaviors or ideas, which may fail to detect some of them and not reflect the incidence accurately.

This study divided the samples into three groups based on their self-report of preference Internet application and time cost on it, which may ignore the effect of other Internet applications, such as chatting, blog. Most users are multiple Internet application user who may apply them simultaneously, the Internet application rated by the samples as less frequent use or preference may also contribute to their pathological Internet use.

The study was conducted only in one of the public universities, Universiti Teknologi Malaysia, which may not reflect the situation of students in Private universities and may be difficult to generalize the finding to the university students all over Malaysia.

1.11 Definition and Operational Definition

There are several terms frequently used in this research. The conceptual and operational definitions as used in this study are listed in the following pages.

1.11.1 Pathological Internet Use

Young (1998) first studied the pathological Internet use compared with the criterion of pathological gambling defined by the DSM-IV. Individual who meet the
five of eight criterion of the Internet Addiction Diagnostic Questionnaire (IADQ) is considered as suffering with pathological Internet use (PIU).

Davis (2001) divided pathological interne use (PIU) into two types which is specific and generalized. Specific pathological Internet use refers to the individuals that are dependent on a specific function of the Internet, which would exist without Internet, such as online sexual materials/services, online auction services and online stock trading, and online gambling. While, generalized pathological Internet use refers to overuse of Internet generally and multidimensionality, which can be related to the social aspect of Internet and increased desire to stay in a virtual social life, such as e-mail, chatting.

Pathological Internet use (PIU) in this study refers to the excessive use of Internet and significantly influences one’s normal life including psychological, family, social problems, which was determined by Internet Addiction Scale (IAT). Individual who scored 68 or higher than 68 on the 17-item of IAT are deemed as PIU.

1.11.2 PIU symptom

PIU symptom refers to the symptom related to individual’s pathological Internet use (e.g. behavioral, emotional symptom), which was measured by Internet Addiction Scale (IAT). As IAT in this study was identified as a three-factor model, including neglect work and social life, time management problem, emotional conflict, the PIU symptom in this study was divided into these three sub-constructs.

1.11.3 Massively Multiplayer Online Role-playing game

Massively Multiplayer Online Role-playing Game (MMORPG) are fantasy role-playing games played on the Internet, where several thousand various players from all around the world are present at the same time. A player controls his or her
character, which can fulfill various tasks, advance its capabilities, and interact with other player’s characters. A player can perform a wide range of activities, from building his or her avatar’s character to interacting with other players in both positive ways (conversation) and negative ways (aggression) (Young and Nabuco de Abreu, 2011).

Massively Multiplayer Online Role-playing Games (MMORPG) in this study refers to all the online role-playing games which allow a large number of individuals to play simultaneously in a virtual game world. These games include Everquest, Dark Age of Camelot, Ultima Online, Star Wars Galaxies, Final Fantasy XI, and World of Warcraft, etc.

1.11.4 Social Networking Site

Boyd and Ellison (2008) defined the social networking site (SNS) as “web-based services that allow individual to construct a public or semi-public profile within a bounded system; articulate a list of others users with whom they share a connection; view and traverse their list of connections and those made by others with the system”.

Social networking site (SNS) in this study refers to a web site that provides virtual community for individual to create their personal profile and interact with their real-life friends and other individuals with similar interests, such as Facebook, MySpace.

1.11.5 General Internet user and Others

General Internet user in this study is Internet user who may use various Internet applications, but is fascinated on some special Internet application or does not have favorite Internet applicaiton.
Others is Internet user who has other favorite Internet application than MMORPG and SNS, such as online shopping, searching.

1.11.6 Cognitive Distortion

“Cognitive distortion” was first proposed by Beck (1967) in the depression research, which was defined array of errors in thinking including arbitrary inference, selective abstraction, overgeneralization, magnification and minimization, personalization, absolutistic and dichotomous thinking.

Burns (1999) proposed ten types of cognitive distortion based on Beck’s work, including all-or-nothing thinking, overgeneralization, mental filter, discounting the positive, jumping to conclusions, magnification, emotional reasoning, should statements, labeling, personalization and blame.

Cognitive distortion in this study refers to errors either in interpretation or cognitive processing, which was examined via the cognitive distortion scale adapted by researcher. The short-form cognitive distortion scale has four subconstructs, externalization of self-worth, magnification and minimization, perfectionism, comparison to others & labeling.

1.11.7 Motivation

Cuirrin (2007) reviewed the previous research and defined motivation as a “set of processes that simulate, guide and sustain human behavior towards accomplishing some goal”. It is a dynamic internal state resulting from the influence of personal and environmental factors. Motivation refers to “the reasons underlying behavior” (Guay, Chanal, Ratelle, Marsh, Larose, and Boivin, 2010).
Motivation in this study refers to the processes that accounts for an individual’s intensity, direction and persistence of efforts towards Internet use. It will be assessed by a motivation of Internet use scale adapted by researcher. There are three sub-constructs in motivation of Internet use, entertainment and escape, social recognition and relationship maintenance, information seeking.

1.11.8 Loneliness

Perlman and Peplau (1981) defined loneliness as “the unpleasant experience that occurs when a person's network of social relations is deficient in some important way, either quantitatively or qualitatively”.

de Jong Gierveld (1998) reviewed the previous study and defined loneliness as “a situation experienced by the individual as one where there is an unpleasant or inadmissible lack of (quality of) certain relationships. This includes situations in which the number of existing relationships is smaller than is considered desirable or admissible, as well as situations where the intimacy one wishes for has not been realized. Thus loneliness is seen to involve the manner in which the person perceives, experiences, and evaluates his or her isolation and lack of communication with other people”.

Loneliness in this study is defined as the unpleasant feeling perceived by individual with social network deficits, which was examined by short-form UCLA Loneliness Scale (ULS-8) (Hays and DiMatteo, 1987).

1.11.9 Depression

Depression refers to a wide range of mental health problems characterized by the absence of a positive affect (a loss of interest and enjoyment in ordinary things and experiences), low mood and a range of associated emotional, cognitive, physical
Depression in this study refers to depressed or sad mood, and decreasing interest in various activities, which could further influence individual’s thoughts, behavior, feeling and physical well-being. It was examined by the depression subscale of The Depression Anxiety Stress Scale-21 (DASS-21) which is a self-report measure of depression developed by Lovibond and Lovibond (1995).

1.11.10 Stressful Life Events

Stressful Life Events is defined as stressful stimuli or situations to which everyone is exposed to a greater or lesser extent in the natural course of life (Dohrenwend and Dohrenwend, 1974).

Dohrenwend (2006) defined stressful life events as “occurrences that were likely to bring about readjustment-requiring changes in people’s usual activities”.

Stressful life events in this study are array of stressors associated to University students’ normal life which may produce stress on them, such as study, examinations. It was examined by a stressful life events scale adapted by researcher. Four sub-constructs were identified in this study, which are transformation on study, interpersonal & intrapersonal hassles, academic performance hassles, negative life events.

1.11.11 University Student

University student refers to the individual who pursue higher degree in university, which usually include the undergraduates and postgraduates.
In this study, university student is referred to the full-time undergraduate students in Universiti Teknologi Malaysia (UTM), usually including the students at the first year to the fourth year.

1.12 Summary

This chapter first introduced the development of Internet, and its advantages to contemporary life. The negative effect brought by the excessive Internet use that may lead to pathological Internet use was further discussed. Background of Massively multiplayer online role-playing games (MMORPG) and social networking site (SNS) regarding to the pathological Internet use in the previous literatures was illustrated in detail. A statement on the prevalence of pathological Internet use (PIU) in Malaysia, more opportunities and easier to develop pathological Internet use among University students, as well as the inconsistent findings and research absent from the previous researches were elaborated to stress the necessities to carry out this study. Objectives, questions and hypothesis were listed to instruct this study. The significance of how this study would benefit the empirical and practical field was explained.

In theoretical framework, this chapter introduced neuropsychological chain model of pathological Internet use from the China Youth Association for Network Development (CYAND, 2005) as its cornerstone to explain the process of development on pathological Internet use. Theories of use and gratification, Davis and Caplan referred as its superstructure to this study. To the conceptual framework, this chapter described the pathological Internet use influenced by multiple-variable system which was summarized to three aspects; include psychological, Internet use, and demographic factors.

The scope, limitation and definition of this study was elaborated in the end of this chapter, which further explained the location, subjects requirement, deficits of this study precisely as well as the key terms and operational definition.
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