http://www.acadpubl.eu/hub/

The Instruments Used in Measuring Internet Addiction: A Review

[1]K. Norliah, [2]S. Safiah, [3]A.H. Mahadi, [4]M. Shahrulanuar and
A. Muhamad Afzamiman
[1,2,3,4,5] Innovative Software System and Service Research Group, C-ACT,
[1,2,3,4,] Centre for Languages and Human Development,
[2,5] Institute of Technology Management and Technopreneurship,
Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya 76100 Durian
Tunggal, Melaka, Malaysia
norliah@utem.edu.my[1], safiahsidek@utem.edu.my[2], mahadi@utem.edu.my[3],
shahrulanuar@utem.edu.my[4], afzamiman@utem.edu.my[5]

Abstract

The growing attention of internet addiction problem has urged the researchers worldwide to develop an instrument to measure internet addiction level among worldwide population. Many of them have develop and adapt the diagnostic and test scale to identify the level of internet addiction among population. Thus, this study are going to conduct comparison analysis of the instruments used based on different platforms, the number of study used and different aspects included to other study .The assessment used in 28 studies will be discussed based on three type of analysis. Based on this review, IAT instrument was found to be the higher assessment used by the number of studies in order to evaluate internet addiction level which comprise of three dimensions. Most of these studies are mainly drawn from the field of psychology. This review will provide deep understanding on instrument construct to future study in developing new instrument based on internet addiction phenomenon.

Key Words: Internet addiction, instruments, comparison analysis.

1. Introduction

Sophisticated technology has influenced digital native life since early 1990s. Digital native has been born within the technological environment which they are fully exposure to all types of technology and learn how to operate with it. Particular young generation have experienced to handle this type of technology which has been emphasized in primary, secondary and tertiary education especially. Student does not face much difficulty in using online technologies and known as main user of internet [1]. They are dealing with internet network frequently through computer, smart phone and any electronic devices due to its unlimited space and time of accessed [2].The platform being provided by internet pool has been claimed as powerful tool that change human life tremendously. This can be shown by rise percentage of population penetration with internet over last few years and so forth by 29.4% in 2011 to 40.4% in 2024 [3].

A dynamic and valuable change of internet infrastructure has provided the internet user to gain benefits. The changes of internet infrastructure are deployed to deliver higher performance, speed and flexibility to user worldwide. Internet evolution can be perceived through the platform changes and to update the software and network application in order to attract user to this type of technology. The user can easily get access to internet with good variability of internet infrastructure changes without any obstacles. Furthermore, internets also play a part of human role in order to facilitate human work. Nevertheless, the internet evolution has also bring its dark side among users that lead to internet addiction phenomenon [4][5][6]. This phenomenon exerts harmful effect toward the user who misuses the internet. The negative outcomes of internet addiction studied by certain researchers are listed as follow: psychological altered, personality and physical changes, impairment in some relation, poor grade and social discomfort [7][8][9]. The critical of this issue has raised interest from many researchers in developing different instruments to measure internet addiction level. The various instrument developed by past researchers have been used as a tool to measure the level of internet addiction that have invade nation development [10][11]. The criteria included in the instrument become the most priority of most researchers in their study in order to occupy significant cases of diagnosis, clinical symptom, psycho-social perspective, mental health and others [11]. The instruments are considered as an important tool of measuring the level of internet addict. The instrument used can be referred as an initial action to curb one of the critical 21st endemic. Thus, it is crucial to have deep understanding on the platform and the element included inside the instrument of past studies. Certain instrument used may totally similar from the establish instrument based on the common criteria studied except the particular area of linguistic of population and type of respondent. Bashir has adapted Internet Addiction Test from Young research and change to Arabic version [7].

Considering the internet addiction phenomenon has been claimed as the outbreaks in certain country [12], this is the right time to identify an excellent instrument to curb this critical issue. The instrument develop later can be used as a reference to enact the policies toward nation population. This paper is aimed to conduct comparison analysis of instrument used among number of studies in order to assess the level of internet addiction among population. The review is structured according each of section: first section start with introduction, following next section the synthesis of the review. The other two sections will present the methodology and discussion of the study. Finally, the paper section will be ending with a conclusion.

2.   Literature Review

Wide usage of internet worldwide has bring the critical phenomenon or known as internet addiction in certain countries. Thus, studies on internet addiction have been extensive in global country due to the severe level of the phenomenon. Within this study, various type of instrument were established to evaluate the behavioural of internet user, symptom, personality, family relation, psychological perspective, social, environmental dynamics and the negative consequences of internet addict [2]. Due to high focus of instrument used to measure level of internet addiction, this study mainly focuses on three main aspects of instrument developed which is the platform of using instrument, the comparison analysis between number of studies and the criteria which experienced by addict to be included in the instrument developed.

Platform of Conducting the Instrument

Most of the researchers are conducting quantitative methodology to assess internet addiction level. They conduct research technique such as in person survey and the electronic survey such as online survey. Bashir [7] were conducted survey comprise of IAT test to the all eligible nursing students with aiming to identify the level of internet addiction among students. In addition, Azher [13] were also conducted survey in person by using IAT and Beck Anxiety Inventory (BAI) instrument with aiming to identify the prevalence of internet addiction among master students. Quantitative research methodology not only focused to survey in person but various technique of conducting survey can be used. One of the techniques is the electronic platform or known as online platform in conduct survey. They are using similar platform of conducting the methodology with various type of instrument. Kapahi [14] were using IAT instrument and conduct the survey through online platform to examine the level of internet addiction among youth. However, there are limitations of conducting survey in person by taking longer time and costing more compared to the online platform.

While some researcher conduct their research using mixed method research by combine the quantitative and qualitative methodology. Madhukar [15] has conduct research by combining the methodology to determine the impact of

internet technology toward user healthy. This type of methodology has provided more complete view because it is more desirable technique which meet specific requirement on general methodology. Nevertheless, the limitation of conducting mixed method research is to cope with a greater time of commitment required.

Analysis of Instrument Used in Number of Study

Various instruments have been developed by researcher to conduct study. IAT is the most global measurement used to examine the level of internet addiction of population. Most of studies used Internet Addiction Test to measure internet addiction level which is developed from [10] research and validated by [16]. IAT instrument is developed to distinguish the user based on normal, moderate or severe level of addict via Likert scale. Bashir [7] stated that nearly half of students experience internet addiction which mostly dominated by male gender. While, Christakis [17] claimed that only 4% of student has high score on internet addiction level with different range of psychological behaviour. Some study has conduct internet usage pattern which are comprised the level of internet addiction, internet behaviour and the gender differences [18]. Although most of the studies have shown the psychometric properties of IAT, yet, there is a lacking on the optimal overall structure of IAT instrument and its stability across culture.

The other instrument used in certain study is General Health Questionnaire-28 (GHQ-28) which is developed by Goldberg and has been translated in 38 languages. GHQ-28 consists of 28 items and is designed to measure individual emotional disorders. Mostafaei [8] conduct IAT and GHQ instrument to identify the relationship between internet addiction level and mental health among university students. He found that there are no significant relation between internet addiction level and mental health among them. While Saraei [19] has using similar instrument as Mostafaei study except that her study are focusing in degree of association between internet addiction, mental health and academic performance. However, most of the researcher who are using GHQ instrument do a combination with IAT instrument in order to measure the level of internet addiction. Other instruments developed are not really utilized by other present study. Such of the other instruments are PHQ, PANAS, CSAS, CIUS, UPI, EMBU, MMPI, CPYDS, OCS, BAI, DUKE, MBTI.

The Criteria Included in the Instrument

Although some of the validated instrument have multifariousness of overlapping criteria of internet addiction yet a number of studies has provided a different set of criteria in identifying internet addiction among population [20][21]. The paper indicate that IAT studies totally focused on the implication of the internet addict behavioral which underlying psychometric construct of IAT such as the emotional, psychological conflict, time management issue and mood modification. Bashir [7] has focused on the IAT criteria mainly drawn from psychological aspect with association of gender. Khoshakhlagh [22] mainly focused on the psychological aspect in assessing internet addiction level. This study stated that the criteria developed by the researcher are somehow related

with the degree of using internet and the consequences toward the users. However, this research found that IAT instrument should be measured in multifaceted construct that integrated others criteria too. So, it is easier to assess internet addictive behaviour from all dimensions.

BAI are focused on measuring anxiety symptoms and SCL-90 is used to measure the psychological problems of respondent [13][4]. DASS more focused towards anxiety, depression and stress of internet addict [20]. PANAS instrument more concentrate to respondent emotion [23]. Various instrument are used to measure psychological aspect of internet addict, yet, there is a limitation of those instrument used because of the element observed cannot be compile in one instrument.

After conduct a comparison analysis of instrument used in recent study, we concluded that various type of instrument are used to measure internet addiction among population. However, the different type of instrument used is basically covered on limited dimensions. Thus researcher emphasizes the need to do comparison analysis based on the platform conduct, analysis of instrument based on number of study and the criteria observed. The respondent will be categorized according to the instrument used either they are severe addict, moderate or normal category.

3.   Methodology

We conduct a review paper based on the existing findings which focus on internet addiction worldwide. We should follow the protocol of conducting the research to ensure this paper contribute to body of knowledge to our country. Most of the selected papers are focusing on students in secondary school, college and universities students. The paper can be accessed through online search engine such as Google database, SCOPUS, IEEE and etc. The important keywords searched are factors of internet addiction, psychometric properties of instrument and internet addiction. Based from the keywords, we found that there are many papers related to our topic which are about 1,150,000 papers. Then we proceed to first step by scanning the abstract and introduction of the papers. About 80 relevant papers have been selected. There is only 28 papers should be included after critically evaluate the paper. Once we have done evaluating the paper, we continue to summarize the contents of our study to review other researcher's work that imply to our topic. The summary should be in a table form to ease our work in making analysis comparison in further step. In the end the finding will be presented in writing form.

4.   Discussion

The increasing percentage number of internet addicts has become a controversial issue among internet user in a population. Most of the researcher emphasized the need to find the causal that affect internet addiction problem. Hence, a need to measure the addicts level and behavioural has become the

most significant assessment in their study.

Different Platform of Using Instrument

Most of the researcher are interesting in observe and understand the current phenomena related to their study. There are various design used in research which depends on researcher aim of study.
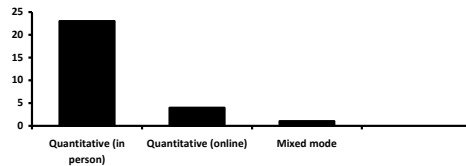

Figure 1: The Different Platform Used in Recent Study

Based on the figure above, 23 study are conduct quantitative research method by distributed the survey in person compared to the online platform. However, there is a limitation of conduct survey in person by taking longer time and cost more. While, the online platform has improve the limitation of survey in person and it is easy to analyse data. But still, the researcher and reader have doubt to the precise answer when they complete online survey. The least platform used by Madhukar [15] to identify the internet addiction is mixed mode method. This method has a combination between quantitative and qualitative methodology. Mixed method can be effective design to use to conduct research, yet there are many weaknesses of the method to be carried out. It can be concluded that most of the researcher prefer to use quantitative method by conduct survey in person. In person survey were the main mode of data collection regarding to this topic.

Frequency of Instrument Used in Recent Study

Figure 2 show the various instrument used in many study to evaluate internet addiction level among respondent.

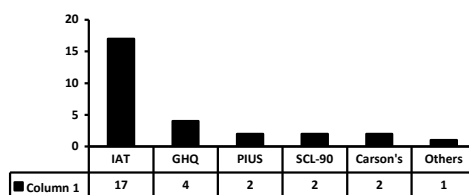| Column 1	IAT	GHQ	PIUS	SCL-90	Carson's	Others
	17	4	2	2	2	1

Figure 2: Frequency of Instruments Used in Recent Study

IAT is one of the most utilized instruments in worldwide as shown in in Figure 2. IAT has been used by 17 studies and translated into several languages such as Chinese, Persian, Korean, German, Portuguese, Arabic, Italian, etc. [9][5][8] [24][25]. Young [10] has been developed her assessment step by step in order to increase the sensitivity of the instrument based on its reliability and validity. She has classified the internet addiction level according to mild, moderate and

severe stages. IAT instrument was developed based on the improvement of YDQ and IADQ structures. Widyanto and McMurran [16] has conduct analysis on IAT factor and reveal six factors of IAT item which are salience, excessive use, neglect work, anticipation, lack of control and neglect social life. IAT was evaluated using confirmatory approach in order to assess the psychometric properties consist of three dimensions namely: withdrawal and social problem, time management performance and reality substitute. The dimensions were then correlated with a number of criteria such as academic performance, gender, internet usage and psychology. Bashir [7] correlated IAT dimensions with gender. It can be concluded that the dimension of IAT has meet certain criteria in different studies.

The second high instrument used in four studies is General Health Questionnaire (GHQ) as shown in figure 2. GHQ has been constructed and utilized in various versions with different length of items. GHQ is used as screening instrument in identifying the psychological distress among respondent. Kutty [5] claimed that there is a positive relation between internet addict with psychological distress among students. It implies most of the respondent who addict to internet having psychological problem in their life.

While the other instruments developed are less utilized by recent study. It might because of the construct viewpoint are focused to individual and cannot be generalized.

The Criteria Include in the Instrument

Researcher should be determining the best kind of data gathering approaches who, when and how the data will be collected. The instrument utilized by researcher should be included the observed criteria which provide the similar conditions as to those specified to be target of study. The entire instrument used show high validity and reliability.
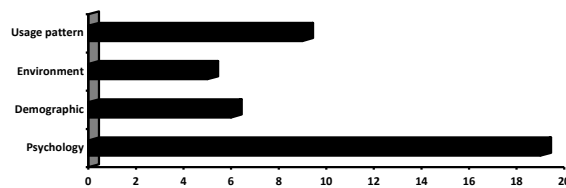

Figure 3: The Criteria Involved in the Instrument

Based on figure 3, recent study has mainly focused on psychological aspect that relate to internet addiction. The psychology show the highest score in 19 studies related to this topic. However there are various sub-element of psychology that has raised interest among researchers. Psychology is a broad area which later can be divided into many elements namely: anxiety, depression, stress, loneliness, behaviour, personality and emotion. Khoshahklagh [22] has determined mental health of internet addict using Carson instrument which comprise of anxiety, stress and depression. Various instrument developed are

aligned with the sub-element of psychology. GHQ, DASS, Online Cognition Scale (OCS), Beck Anxiety Inventory (BAI), Patient Health Questionnaire (PHQ), NEO, Positive and Negative Affect Scale (PANAS), Symptom Checklist 90 (SCL-90) mainly focused on mental health of addict, loneliness, depression, anxiety, internet addict personality, emotion and symptom psychopathology respectively [7][20][26][13][27][17][23][4]. While, certain researcher are using IAT to measure internet addict behaviour.

Second higher criteria included in instrument are the usage pattern among respondent. They mostly assess usage pattern among respondent through the duration uses, location and purpose of access. The instrument quite being used by the respondent is Problematic Internet Usage Scale (PIUS), Compulsive Internet Use Scale (CIUS) and Internet Addiction Diagnose Questionnaire (IADQ). Two others criteria included in instrument are demographic and environment. The Environment is divided into many parts which are social and physical element. Social also comprise many items below and one of it has become interest to this study which is the relation between families [21]. The physical aspect has been conduct by researcher to correlate the impact of internet addiction toward their physical healthy. Demographic usually discussed the effect of internet addiction that relate to gender, academic performance and parents socio-economic. It can be concluded that studies on internet addiction have been extensive which mainly drawn from psychology aspect. Further, it is believed that the criteria included in instrument are interrelated to each other that resulting to internet addiction. There are three part of analysis of recent studies that have been discussed above which are the platform of conduct the survey, the frequency of instrument utilized by other study and the criteria should be included in the instrument. It implies that most of the researcher were using IAT instrument through in person survey which mainly comprised of psychological aspect inside.

5. Conclusion

As a brief review, internet addiction is advancing rapidly worldwide without any specific proactive measurement especially in Malaysia. In regard to this phenomenon, the interest of researcher to conduct this study has been increasing. However, the difficulty to assess the severity of internet addict has urged researchers to develop an assessment to measure internet addiction level. Based on the existing literature review, the study has doing comparison analysis between other studies by addressing the platform of instrument conduct, the frequency usage of instrument by number of study and the element which mainly focused in construct the instrument. Most of the researchers particular conduct in person survey to distribute the instrument toward respondent. The platform used by researcher is definitely suitable to their aim of study and the phenomenon occurred compare to other platform. IAT is the most extensive instrument used among researcher all over the country. The latent structure of IAT which contain three dimensions of withdrawal and social problem, time

management and performance of respondents met the interest of researcher study. Recent studies have mainly focused on psychological aspect because the internet addict is described as an impulse control disorder. Thus, most of the researcher interrelate the psychology aspect with other criteria to strengthen their research. Thus, future study is needed to provide good basis on refining scale and further improve the instrument by recruiting the criteria as discussed above.

Acknowledgement

References

[1]   S.A., Sharifah. Internet dan anda: teman untuk melangkah ke dunia siber, Federal Publication, Kuala Lumpur. 1997

[2]   S., Pui and M., Kit. Factor structure for the internet addiction test: a confirmatory approach. International DSI/ Asia and Pacific DSI, p.1-12, July, 2007

[3]   Internet World Stats Usage and Population Statistics. Retrieved from   InternetWorldStats: http://www.internetworldstats.com/emarketing.htm,   June   12, 2015

[4]   M., Koc. Internet addiction and Psychopatology. Turkish Online Journal of Educational Technology, vol.10, no.1, p. 143-148, 2011

[5]   K., Nizar, A. M., Sreeramareddy, T., Chandrashekhar. A cross-sectional online survey of compulsive internet use and mental health of young adults in Malaysia. Journal of Family Community Medicine, vol.21, no.1, p. 23-28, 2014

[6]   S., Takeshi. Internet addiction among students: Prevalence and Psychological problems in Japan. Japan Medical Association Journal. vol.4, no.(7-8), p.279-283, 2006

[7]   I.A., Bashir. Internet Addiction and Psychological Morbidity among nursing students in Gaza Palestine. American Journal of Applied Psychology. vol.3, no.4, p.99-103, 2014

[8]   A. Mostafaei, and M., Khalili. The relationship between internet addiction and mental health in male and female university students. Annals of Biological Research. vol.3, no.9, p.4362-4366, 2012

[9]   G., Deng and Y., Xuan. Internet addiction and mental health status of Chinese college freshmen. Bioinformatics and Biomedical Engineering. ICBBE 2009. 3rd International Conference on, p.1-4, 2009

[10] K.S., Young. Internet addiction: the emergence of a new clinical disorder. Cyberpsychology & Behavior. vol.1,no.3, p.237-244. 1988

[11] D.P., Goldberg, and V.F., Hillier. A scaled version of the General Health Questionnaire. Psychology Medical. vol.9, no.1,p.139-145, 1979

[12] D.J., Kuss, and M.D., Griffith. Excessive online social networking: can adolescents become addicted to facebook. Journal of Education and Health. vol.29, no.4, p.68-71, 2011

[13] M., Behram, Salim, Bilal, Altaf, Mehvish. The relationship between internet addiction and anxiety among students of university Sarghoda. International Journal of Humanities and Social Science. vol.4, no.1, p.288-293, 2014

[14] A., Kapahi, S.L., Choo, S., Ramadass, and N., Abdullah. Internet Addiction in Malaysia Causes and Effects. International Business Journal. vol.5, p.72-76, 2013

[15] M., Madhukar and K.M., Nalawade. Study of internet use and health related implications of internet users. International journal of advanced research in computer sciences and software engineering. vol.2, no.11, p.89-94, 2012

[16] L., Widyanto and M., McMurren. The Psychometric Properties of the Internet Addiction Test. CyberPsychology & Behavior. vol.7, no.4, p.445-453, 2004

[17] D.A., Christakis, M.M., Moreno, L., Jelenchick, M.T., Myaing, C., Zhou. Problematic internet usage in US college students: a pilot study. Journal Biomedical Central Medicine. vol.9, no.77, p.1-6, 2011

[18] A., Maria, E., Sidoti, and S., Pignata. A pilot study of internet usage pattern in a group of Italian university students. Italian Journal of Public Health. vol.9, no.2, p.67-72, 2012

[19] F., Saraei, M.E., Ebrahimi, M., Reza. Relationship between Internet addiction Mental Health and Academic Performance Among adolescent 15 to 18 Years Referred to Cafe-Net in Hamadan-Iran. Life Science Journal. vol.10, no.1, p.1260-1267, 2013

[20]   X., Lu and Y.K., Jiar. Depression and internet use in sample of Malaysia Undergraduate students. Journal of Education & Vocational Research. vol.4, no.11, p.317-325, 2013

[21]   H., Guanli, J., Ru, H., Guanhua, W., Rengang. Contribution of component factors to internet addiction disorder for vocational students. Information Technology and Applications (IFITA), International Forum on, vol.3,   p.206-209, 2010

[22]   H., Khoshakhlagh, and S., Faramarzi. The relationship of emotional intelligence and mental disorders with internet addiction in internet users university students. Addict & Health Journal. vol.4, no.(3-4), p.133-141, 2012

[23]   Vidyachathoth, B., Kashmi, N.A., Kumar. Correlation between Affect and Internet Addiction in Undergraduate Medical Students in Mangalore. Addiction Research and Therapy, vol.5, no.1, p.175-178, 2014

[24]   D., Goel, A., Subramanyam, R., Kamath. A study on the prevalence of internet addiction and its association with psychopatology in India adolescents. Indian Journal Psychiatry. vol.55, no.2, p.140-143, 2013

[25]   J., Hamissi, M., Babaei, M., Hosseini. The Relationship between Emotional Intelligence and Technology Addiction among University Students. International Journal of Collaborative Research on Internal Medicine and Public Health. vol.5, no.5, p.310-319, 2013

[26]   A., Akin and M., Iskender. Internet addiction and depression, anxiety and stress. International Online Journal of Educational Sciences. vol.3, no.1, p.138-148, 2011

[27]   B., Eshraf, Y., Abedini, A., Kheradmand. Internet addiction based on Personality Characteristics of high school students in Kerman Iran. Addict & Health Journal. vol.3, no.(3-4), p.85-91, 2011

[28]   J., Hassan and R., Shahrina. Ketagihan Penggunaan Internet di Kalangan Remaja Sekolah Tingkatan 4 di Bandaraya Johor Bahru. Journal of Technical, Vocational & Engineering Education. vol.6, p.23-43, 2012