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Internet addiction among college student of educational administration programs: network psychometrics analysis

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Abstract. Increasing the number of Internet users each year needs to be a concern. Judging from the world rankings, Indonesia is ranked 6th as most Internet users. However, predicted will experience a significant increase in the next two years. As Internet users increase, issues like Internet addiction are the parts that should be thought of by many people. This study measured the level of Internet addiction to students in terms of Internet Addition Core Symptom and Internet Addition Related Problem. The study involved 83 students of Education Administration who still have active status and are taken at random. Measurement of Internet addiction in this study using Chen Internet Addiction Scale (CIAS). Data findings were analysed using network psychometrics. Network psychometric analysis shows the interaction between factor structure is excellent. Based on the analysis of network psychometry can be seen positive and negative partial correlation of each item. The findings from this research can be an important input for the academic community and can be the starting point for further research.

1. Introduction

Internet addiction problems have gained attention in recent years [1], [2]. Internet usage is exploding around the world, with global Internet users reaching over 2.3 billion in 2011 [3], [4]. If in 2011 alone the number of Internet users reached over 2.3 billion, what about the year 2018? By 2018, about 3.6 billion people on Earth access the Internet at least once every month. According to market research Institute e-Marketer, netter population from the country reached 83.7 million people in 2014. In 2017, e-Marketer estimates netter Indonesia will reach 112 million people, beating Japan in the fifth [5], [6]. Peart said developing countries such as Indonesia and India still have room for the growing number of Internet users whose size can reach double digits every year [6]. Above Indonesia, for now the top five internet users in the world are occupied by China, the United States, India, Brazil and Japan [7], [8].

Research in Iran, found that Internet addiction to students has weaker social relationships and weaker mental health [9]; they prefer to use the Internet to have social connections with friends, family, spouses, and others [4]. People addicted to the Internet are depressed [10]. Internet Addiction is associated with attention deficit/hyperactivity symptoms (ADHS) [11], [12], low self-esteem [13], [14], anger expression [15], hostility [11], depressive symptoms [14], [16], impulsivity [17], [18] and obsessive compulsive symptoms [12], [18], [19]. Finally, according to a meta-analysis [20], Internet Addiction is associated with alcohol abuse, ADHS, depression and anxiety [21].

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In terms of specific applications, gaming has been extensively researched as an online application with a high addictive potential [22]–[26]. Moreover, the use of social applications, namely online chatting [22], [23], [27], social networking sites [28]–[30], such as Facebook, Instagram [31], and online instant messengers [25], [32], [33] have been found to be associated with Internet addiction. Furthermore, spending more time on online activities such as shopping and gaming has been linked to depressive symptoms [26], [33]. In addition to the use of specific online activities, personality traits have been linked to Internet addiction. Higher scores on neuroticism [34], [35], and low scores on extraversion [36], [37], agreeableness and emotional stability [36], [38] have been established as potentially important risk factors for Internet addiction. Internet gaming addiction specifically has been associated with neuroticism [39], [40], aggression and hostility [39], [41], [42], introversion [41], social inhibition [43], sensation seeking [39], and diminished agreeableness [40]. In spite of the substantial evidence for the role of personality traits, far less is known about interactions between traits and specific uses of the Internet in increasing the risk of being addicted to the Internet [26].

In terms of risk populations, students have been identified [44] for several reasons. They have a natural affinity towards the Internet [26], [45] and their conspicuous Internet literacy has been linked to Internet addiction [29]. Moreover, they typically have free and unlimited access, flexible schedules, and freedom from parental interference. Additionally, their online activities are not externally controlled, university bodies expect that they make use of the technology, and university settings can foster social intimidation and alienation [26], [46], [47]. The same condition applies to students of Educational Administration at Padang State University. And most of the students are indications of Internet addiction. So it needs to be investigated further related to Internet addiction student Education Administration.

2. Experimental Method

The sample in this study comprises 83 respondents. Respondents are students of educational administration, taken at random, with distribution 30.12%, are male and 69.88% are female. This study reveals Internet addiction in terms of two aspects of Internet addiction tendency and Internet addiction related problems. Internet addiction is measured using The Chen Internet Addiction Scale (CIAS) [48]. Data finding was analysed using network psychometrics analysis [49]. Which involves JASP Version 0.8.6.0 software. A collection of research data is available in the Open Science Framework.

3. Result and Discussion

3.1. Descriptive Statistics

Reliability test is done using JASP 0.8.5.1 software. From the results of reliability test in table two note that the variable Internet addiction is reliable, because it has a Cronbach Alpha value greater than 0.6, in this section also describes Descriptive Statistics Internet Addition Core Symptom and Internet Addition Related Problem (table 1).

Table 1 shows the valid, missing, Mean, Standard Deviation, Minimum value and the maximum value of Internet reddened and Internet addition related problem variables. Based on table 1, the IAS14 item has a higher standard deviation score than the other item of 1,063. this means that IAS14 is more heterogeneous than another item.

	Valid	Missing	Mean	Std. Deviation	Minimum	Maximum
IARP1	83	0	2.843	0.9303	1.000	4.000
IAS1	83	0	2.398	0.9492	1.000	4.000
IAS2	83	0	2.988	0.8337	1.000	4.000
IAS3	83	0	2.892	0.9629	1.000	4.000
IAS4	83	0	2.434	0.7839	1.000	4.000
IAS5	83	0	3.120	0.9160	1.000	4.000
IARP2	83	0	2.398	0.8687	1.000	4.000
IARP3	83	0	2.325	0.9641	1.000	4.000
IAS6	83	0	2.253	0.7130	1.000	4.000
IAS7	83	0	2.217	0.9377	1.000	4.000
IAS8	83	0	2.398	0.9620	1.000	4.000
IARP4	83	0	2.771	0.7703	1.000	4.000
IARP5	83	0	2.578	1.037	1.000	4.000
IAS9	83	0	2.181	1.061	1.000	4.000
IARP6	83	0	2.518	0.8884	1.000	4.000
IAS10	83	0	2.639	0.9700	1.000	4.000
IARP7	83	0	2.157	1.006	1.000	4.000
IARP8	83	0	2.277	0.9281	1.000	4.000
IAS11	83	0	2.434	0.9524	1.000	4.000
IAS12	83	0	2.181	1.026	1.000	4.000
IARP9	83	0	3.205	0.8801	1.000	4.000
IAS13	83	0	2.398	0.8826	1.000	4.000
IARP10	83	0	2.048	0.9988	1.000	4.000
IAS14	83	0	2.458	1.063	1.000	4.000
IARP11	83	0	2.169	0.9730	1.000	4.000
IARP12	83	0	2.578	0.8571	1.000	4.000

 Table 1. Descriptive Statistics Internet Addition Core Symptom and Internet Addition Related

 Problem

Table 2. Scale Reliability Statistics Internet addition tendency an Internet addition related problem

	Cronbach's α
Scale	0.932

Note. Of the observations, 83 were used, 0 were excluded listwise, and 83 were provided.

3.2. The network conditions

Furthermore, the network conditions of the factor structure of Internet Addition Core Symptom and Internet Addition Related Problem are graphed in figure 1 and figure 2. In Figure 1, the pink node is the IARP node 1,2,3,4,5,6,7,8,9,10,11,12 (Internet Addition Related Problem). While the green node Oscar's node IAS 1,2,3,4,5,6,7,8,9,10,11,12,13,14 (Internet Addition Core Symptom). More details can be seen in table 4.



Figure 1. A network model interaction between the factor structure of Internet Addition Core Symptom and Internet Addition Related Problem.



Figure 2. Closeness, betweenness, and degree centrality of the three networks describe of Internet Addition Core Symptom and Internet Addition Related Problem

Centrality measures per variable				
	Network			
Variable	Betweenness Closeness Strength			
IARP1	0.692	-0.773	-0.192	
IARP10	1.674	0.861	1.547	
IARP11	1.674	0.752	1.210	
IARP12	-0.617	0.216	-1.419	
IARP2	-0.398	0.748	0.842	
IARP3	-0.726	-0.078	-0.090	
IARP4	-1.271	-0.924	-1.616	
IARP5	-0.398	-1.001	-0.711	
IARP6	-0.289	-0.605	-1.002	
IARP7	-0.071	-0.827	0.130	
IARP8	-0.835	-0.875	0.708	
IARP9	-1.162	-1.416	-1.099	
IAS1	0.801	1.183	0.097	
IAS10	0.474	1.003	0.924	
IAS11	1.019	0.599	0.827	
IAS12	1.019	0.172	-0.030	
IAS13	1.128	0.943	0.874	
IAS14	-0.726	-0.203	-0.146	
IAS2	0.474	0.579	0.493	
IAS3	-1.162	-0.236	-0.107	
IAS4	1.565	1.036	0.944	
IAS5	-1.489	-1.411	-1.376	
IAS6	-1.707	-2.617	-2.488	
IAS7	0.147	1.046	0.472	
IAS8	0.038	0.985	0.680	
IAS9	0.147	0.845	0.531	

Table 3. Description of centrality measures per variable in Figure 2

 Centrality measures per variable

Fable 4. Description	of nodes shown	in Figure 1	and Figure 2
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Nodes	Description
IAS1, IAS2, IAS3, IAS4, IAS5, IAS6, IAS7,	Internet Addition Core Symptom
IAS8, IAS9, IAS10, IAS11, IAS12, IAS13,	
IAS14.	
IARP1, IARP2, IARP3, IARP4, IARP5,	Internet Addition Related Problem
IARP6, IARP7, IARP8, IARP9, IARP10,	
IARP11, IARP12.	

Regarding Figure 1, there is a positive and negative partial correlation of each item. The blue line shows a positive partial correlation, and the red line shows a negative partial correlation. The thicker the resulting line means the higher correlation between items [49], [50]. The strongest correlations occur between IARP7 and IARP8. Strong correlations also occur between other items, such as IARP3 with IAS9, IAS8 with IAS10, IAS4 with IAS13, IARP11 with IAS14. While IARP4 items with IAS7, and IARP4 with IARP10 there is no correlation. The interaction between factor structure is fantastic [44]. Figure 2 is made using the plot of centrality and generates the centrality of the three networks shown in Figure 1. All sizes show how important the nodes are in the network, with higher values showing that the node is more important to die the IAS1 node. The IAS1 node has a considerable influence on the network (figure 1).

4. Conclusion

Based on our research, we emphasize that 1) the interaction between factor structure is excellent, 2) the measurement properties of Chen Internet Addiction Scale (CIAS) are sufficient. In principle, the quality of CIAS given to the respondents is very satisfactory. From reliability analysis of Internet addiction variable, Cronbach Alpha value shows 0.932 mean reliable. From the descriptive statistics, Item IAS14 has a higher standard deviation score than any other item of 1,063. This means that IAS14 is more heterogeneous than other items. In addition, network psychometrics analysis shows that IAS1 has the greatest influence compared to other nodes in the network.

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