Does the Association of Social Media Use with Problematic Internet Behaviours Predict Undergraduate Students' Academic Procrastination?

L'association de l'utilisation des médias sociaux avec les comportements problématiques sur Internet permet-elle de prédire la procrastination académique des étudiants de premier cycle?

Dr. Kingsley Chinaza Nwosu, *Nnamdi Azikiwe University, Awka, Nigeria*
Dr. O.I. Ikwuka, *Nnamdi Azikiwe University, Awka, Nigeria*
Mary Ugorji Onyinyechi, *Nnamdi Azikiwe University, Awka, Nigeria*
Prof. Gabriel Chidi Unachukwu, *Nnamdi Azikiwe University, Awka, Nigeria*

Abstract

Researchers are of the view that students' attachment to social media may lead to negative consequences such as postponement of their academic work. Yet how social media use is associated with academic procrastination of students is still underexplored. This study ascertained the pathways through which social media use predicted academic procrastination of undergraduate students. The sample size comprised 500 first year students of the Faculty of Education, Nnamdi Azikiwe University, Awka. Path analysis was employed to test the fit of the hypothetical model and show the direction of relationships between the exogenous and endogenous variables. Results showed that the hypothesized model fits the sample data satisfactorily, and Internet addiction predicted academic procrastination more than any other variable. Social media use had no significant direct effects on academic procrastination but indirectly significantly predicted academic procrastination through internet addiction. This implies that social media use may not lead to academic procrastination until it becomes problematic.

Keywords: Cyber victimization, Social media, Internet addiction, Academic procrastination

Résumé

Les chercheurs sont d'avis que l'attachement des étudiants aux médias sociaux peut avoir des conséquences négatives telles que le retardement de leurs travaux universitaires. Pourtant, la manière dont l'utilisation des médias sociaux est associée à la procrastination des étudiants dans

le cadre universitaire est encore peu étudiée. Cette étude a permis de déterminer les voies par lesquelles l'utilisation des médias sociaux a prédit la procrastination académique des étudiants de premier cycle. L'échantillon était composé de 500 étudiants de première année de la faculté d'éducation de l'université Nnamdi Azikiwe, à Awka. L'analyse de pistes causales a été utilisée pour tester l'adéquation du modèle hypothétique et montrer la direction des relations entre les variables exogènes et endogènes. Les résultats ont montré que le modèle hypothétique s'ajuste de manière satisfaisante aux données de l'échantillon, et que la dépendance à Internet prédisait la procrastination académique plus que toute autre variable. L'utilisation des médias sociaux n'a pas eu d'effets directs significatifs sur la procrastination scolaire, mais a indirectement prédit de manière significative la procrastination académique par la dépendance à Internet. Cela implique que l'utilisation des médias sociaux ne peut pas conduire à la procrastination académique avant qu'elle ne devienne problématique.

Introduction

A number of studies have been carried out demonstrating that academic procrastination could interfere with students' academic successes and life satisfaction (Duru & Balkis, 2017; Ozer & Sackes, 2011; Sirin, 2011; Vargas, 2017). Some of these studies have shown that between 38% - 91% of students are involved in procrastination (Ozer & Sackes, 2011; Vargas, 2017). Academic procrastination has been a significant problem among university students and has been anchored on students' fear of failure and task evasiveness (Ozer & Sackes, 2011). Academic procrastination has negative effects on students' academic outputs (Goroshit & Hen, 2019; Kim & Nembhard, 2019) and well-being (Duru & Balkis, 2017). Kármen et al. (2015) found negative relationships between students' attitude towards school, teacher, and academic self-perception as well as motivation/self-regulation and passive procrastination. Given the negative impact academic procrastination has on students, researchers have built models to explain its mechanism (Batool, Khursheed, & Jahangir, 2017; Cavusoglu & Karatas, 2015; Kandemir, 2014).

Recently, some researchers have extended their models to the use of new technologies and students' academic procrastination (Yang, Asbury, & Griffiths, 2018). Yang, Asbury, and Griffiths (2018) demonstrated the relationships existing among problematic smartphone use, academic anxiety, academic procrastination, self-regulation, and subjective wellbeing using a hypothetical model. Others have provided only individual variable correlations between social media use and academic procrastination (Muslikah, Mulawarman, & Andriyani, 2018) notwithstanding the continuous under-exploration, and the poor understanding, of the mechanism behind procrastination (Procee, Kamphorst, vanWissen, & Meyer, 2014). Delaying the execution of tasks could be better understood when a range of factors are considered that are capable of redirecting students' attention to pleasurable activities with short-term utilities (Siaputra, 2010). The allure that the Internet and social media present has the tendency to result in academic procrastination. Given that adolescents are heavy users of the social media and the fact that it could lead to task delay, it becomes imperative to understand the associations among social media use, problematic Internet behaviours, and academic procrastination.

Literature Review

Theoretical Framework

Theories stemming from psychodynamic, behavioural, cognitive, and the latest temporal motivation theory (TMT) have been advanced to explain procrastination (Siaputra, 2010). Siaputra explained that the psychodynamic perspective situates procrastination as a defence mechanism resulting from failure to complete a task which in turn threatens the ego of the individual. The behavioural theorists postulate that procrastination is reinforced when an individual repeatedly gets away with dilatory behaviour, while the cognitivists present procrastination as resulting from faulty thought processes and belief systems that lead to delay in task execution (Siaputra, 2010). However, researchers are of the view that TMT is more comprehensive to address the mechanisms of procrastination (Siaputra, 2010; Steel & Konig, 2006; Steel, Svartdal, Thundiyil, & Brothen, 2018). From the TMT perspective, procrastination is linked with the gap existing between an individual's intention and his/her actions indicating that procrastinators are "susceptible to proximity of temptation and to the temporal separation between their intention and the planned act; the more distal, the greater the gap" (Steel et al., 2018, p. 1). TMT is an eclectic motivational theory that lays emphasis on time as a fundamental component of motivation (Steel & Konig, 2006).

Steel and Konig (2006) situated TMT in the explanation of situations in which expectancy, value, and time, which are the core of the theory, simultaneously impact decision making and are in turn impacted by individual differences. For Steel and Konig (2006), one of the suitable examples of a prototypical motivational problems that can be explained using TMT is procrastination which is seen as a 'motivational failure' (Steel, et al, 2018:1). Steel and Konig (2006) acknowledged how complex the mechanism of procrastination is and stated that TMT has the capacity to explain procrastination given that procrastinators are entangled in preference reversal. However, Siaputra (2010) is of the view that theories that have been advanced in the explanation of procrastination, including TMT, have demonstrated their weaknesses. In a bid to make up for these weakness, Siaputra (2010) theorized that procrastination could be comprehensively understood from the angle of delaying or avoiding doing activities with higher long-term utility value to engage in more pleasurable activities with ultimately short-term utility. Siaputra's (2010) opinion can be merged with the propositions in TMT given that these more pleasurable activities with ultimately short-term utility value may stand as ingredients for preference reversal in TMT. This theoretical concern is not fully understood. Modelling social media use and procrastination could give an insight into this concern.

Social Media Use, Problematic Internet Behaviours, and Procrastination

The active use of digital technologies at an early age helps children and adolescents in their cognitive development, as they learn to think creatively (Nikolopoulou, 2018; Yushau, Mji, & Wessels, 2005). Innovations in digital technologies include social media. Social media are online interaction sites that foster interactive participation among people with the intention to build, share, and change their idea and opinions on a wide range of issues (Manning, 2014; Zamri, Zaihan, & Samat, 2018). Social media use is currently the most predominant activity among adolescents (BaÂnyai, et al, 2017) and refers to the access of different social media platforms for diverse reasons and activities (BaÂnyai et al., 2017). Researchers see Internet use

by students as comprising the average time spent on the internet, number of visited web pages, and the most regularly visited websites (Oskouei & Sharma, 2013). Advantages of using social media include social connections and skills, improvement in learning opportunities, and exchange of ideas (Zamri et al., 2018). In view of the above, Fernandes, Maia, and Pontes (2019) have noted that the use of the Internet itself is not inherently evil given its undeniable benefits.

However, behavioural tendencies in online activities that could interfere with adolescents' mental health and academic successes have been documented (Deschamps & McNutt, 2016; Nixon, 2014). Field (2018) is of the view that the widespread use of electronic devices and social networks has resulted in Internet addiction and cyberbullying. Negative side effects result from problematic Internet use (PIU). Recent concern in literature shows that there is not yet consensus on what PIU is (Anderson, Steen, & Stavropoulos, 2017; Fernandes et al., 2019). This has led to the use of different terms to refer to PIU (Anderson et al., 2017; Fernandes, et al, 2019). PIU has remained an "ill-defined and heterogeneous construct" (Spada, 2014, p. 5) with two fundamental features: the aspects of excessive, compulsive Internet use, and the "various adverse consequences of spending too much time on the Internet, such as neglecting social activities, relationships, health and work or school duties, and altering sleep and eating habits in a detrimental way" (Spada, 2014, p. 5). Problematic Internet behaviours in this study go beyond the compulsive use that is detrimental but include unhealthy online behaviours or antisocial Internet use (Ma, 2011) in the sense that they are capable of affecting the well-being of the individual and other online users connected to him/her. These problematic Internet behaviours include cyber bullying and victimization and Internet addiction.

Cyber bullying and victimization have been studied as online antisocial Internet use (Lapierre & Dane 2020; Ma, 2011) connoting intentional and repeated harm inflicted through electronic means (Brown, Demaray, & Secord, 2014). A study in a Nigerian university has documented that a range of 48% - 57% undergraduates have been bullied through various cyber media and 28.6% - 40.0% have bullied others through these devices (Nwosu, Ementa & Ejikeme, 2018). Research has shown that 'between 20% - 50% of adolescents have been victims of peer aggression by electronic means at some time, and between 2% - 7% have suffered severe victimization' (Garaigordobil, 2011 as cited in Álvarez-García, Perez, Gonzale, & Perez, 2015, p.227). Recent studies have documented the negative impacts cyberbullying and aggression could have on adolescents including suicidal ideation, social isolation, mental illness, low self-esteem, poor self-concept, loneliness, and school phobia (Deschamps & McNutt, 2016; Nixon, 2014; Sourander et al., 2010). Apart from cyber victimization and aggression, another online problem is Internet addiction which results in neuro-psychological disturbances (Cash, Rae, Steel, & Winkler, 2012). Shaw and Black (2008), along with Sutton and Subbarao (2011), are of the opinion that Internet addiction is manifested in excessive and/or regulatory failure in the use of the Internet which leads to a negative effect in the well-being of the individual. This could result in interference with other activities in the life of adolescents due to excessive online engagement. Studies have shown that between 8% - 34% of undergraduate students are Internet addicted (Krishnamurthy & Chetlapalli, 2015; Shao et al., 2018; Xin et al., 2018). This takes up most of their time that could otherwise be used in a meaningful academic venture. Some Internet users tend to develop an emotional attachment to their online friends and activities. This allows them to use functions of the Internet to meet, socialize, and exchange ideas in different chat rooms, social networking websites, or virtual communities (Alassiri, Muda, Ghazali, & Ahamefula, 2014; Mustafa & Hamzah, 2011; Ridings & Gefen, 2004). Reinecke et al. (2018)

noted that literature is replete with studies that demonstrate that "Internet users use online media as tools for procrastination" (p. 862). Similarly, Lian et al. (2018) acknowledged that the popularity of social media has led to increasing problematic social media behaviours and use, both of which have been associated with irrational procrastination. Using qualitative research design, Powell, Gray, and Reese (2013) found that students use social media as tool for procrastination.

Empirical studies have shown that Internet addiction has been found to be negatively related to the academic achievement of undergraduate students (Akhter, 2013) and positively related to academic procrastination of undergraduate student teachers (Kandemir, 2014; Saleem, Owaisi, & Tufail, 2015). Other factors that could be associated with problematic digital technology use include excess time spent online (Savoldi & Ferraz de Abreu, 2016) and number of social media sites engaged in, since absorption by the social websites could lead to addiction (La Barbera, La Paglia, & Valsavoia, 2009). However, the relationships existing among these problematic Internet-related behaviours and students' academic procrastination seem to be underexplored. More so, how the association between social media use and problematic Internet-related behaviours could predict students' academic procrastination among Nigerian undergraduates is yet to be understood.

The purpose of this correlational study is to build a model that will examine the effect of students' social media use as mediated by problematic Internet behaviours on their academic procrastination using a path analysis. We specifically set out to:

1. Develop a causal model to explain how the association between social media use and problematic Internet-related behaviours predicts students' academic procrastination.

2. Estimate the standardized regression weights of the exogenous variables on the endogenous variable.

3. Estimate the indirect and total effects of the exogenous variables on the endogenous variable.

Method

The research design is a correlational research design with two independent (exogenous variables) and four dependent (endogenous) variables with three serving as mediator variables. The study sought to establish a causal model for students' academic procrastination. Hence, path analysis was adopted to develop the causal model. Given the available literature, the researchers theorized that students' unhealthy engagement in online activities could impact on their academic procrastination. The independent variables were the number of social media sites (SMS) used and time spent (TIME) on social media, while the dependent variables are cyber victimization (CV), cyber aggression (CA), and Internet addiction (mediators), and academic procrastination. It was conceptualized that exogenous variables could have direct impacts on students' academic procrastination as well as indirect impacts through Internet addiction, cyber victimization, and cyber aggression (see Figure 1).

The population of the study consisted of the 1,462 first year undergraduate students in the Faculty of Education at Nnamdi Azikiwe University, Awka, who registered for the first-year introductory course in Educational Psychology in the 2018/2019 academic year. The sample size comprised of 500 students who attended a second semester course titled *Introduction to Educational Psychology*. The sampling technique adopted was the convenience sampling in which those who volunteered to participate in the study were given a questionnaire to fill in. First, the researchers explained to the students the essence of the study and assured them that information collected from them was for research purposes and would be kept confidential. They filled in the questionnaire after their classes and it was retrieved from them on the spot.

Four instruments were used in the collection of the data. They are: cyber victimization questionnaire (15 items scaled never = 0, sometimes = 1, several times = 2, always = 3), cyber aggression questionnaire (15 items scaled as: never = 0, sometimes = 1, several times = 2, always = 3). These two instruments were adopted from Garaigordobil's (2015) cyberbullying tests. Garaigordobil (2015) reported good indices of the psychometric properties of the test. However, these instruments were revalidated in Nigeria and the reliability coefficients for the two instruments using Cronbach's alpha test were 0.82 and 0.88 respectively. Other instruments are Internet addiction scale (AIS) developed by Young (1998; 20 items scaled as: does not apply = 0, rarely = 1, occasionally = 2, frequently = 3, often = 4, always = 5) which was also revalidated in Nigeria and its reliability coefficient using Cronbach's alpha test was 0.92. The academic procrastination scale was 21 items scaled as: strongly disagree = 1, disagree= 2, agree = 3, strongly agree = 4 with Cronbach's alpha coefficient of 0.75. This instrument is an adaptation of the scale developed by Abu Ghazal (2012). This instrument has been used by several authors in measuring students' academic procrastination and good psychometric indices have been reported (Mahasneh, Bataineh, & Al-Zoubi, 2016). We relied on the English version used by Mahasneh, Bataineh, and Al-Zoubi (2016) in our adaptation of Abu Ghazal's (2012) procrastination scale.

Data was analysed for the demographic variables using percentages while Pearson and path analysis were used to establish the relationships and the casual model. Path analysis was conducted using SPSS AMOS version 24, and the fit indices and the casual relationships were determined. Because there were missing values, data was imputed, and the Bootstrap bias confidence level (Bollen-Stine bootstrap) was used to establish the significance of the direct and indirect effects of the predictor variables on the independent variable.

Assumption Testing

Sample size. Kline (2011) recommended that the ratio of the number of respondents to the number of parameters be estimated at 10:1, even though a more ideal sample size-to-parameter estimate would be 20:1. Our hypothesized model had 20 distinct parameters with a sample size of 500 amounting to a ratio of 25:1 which falls within the acceptable range.

Missing values. Missing values were handled using regression imputation in AMOS. Regression imputation takes into account "subject patterns of scores across all other variables" (Carter, 2006, p. 4) and predict "a score for each subject by using multiple regression based on their non-missing scores for other variables" (Carter, 2006, p. 4). The essence of this is to preserve the relationship between the variables since imputed values were based on regression models. Then a complete data set was generated for analysis.

Multivariate normality test and outliers. Maximum likelihood estimation assumes variables exhibit multivariate normality. Violation of this could lead to a number of problems including the type 1 error and because chi square of fit index is sensitive to data deviation from the norm and significant outliers, multivariate normality test was conducted. Before this was ascertained, the univariate normality was inspected and based on the values of skewness and kurtosis, most of the individual distributions failed the normality test, resulting to the multivariate normality to deviate significantly. The recommendations of Kline (2011) were followed in which it was stated that no skewness values exceed the absolute value of 3 and that of kurtosis should not exceed the absolute value of 10. In the case of multivariate normality, the value of kurtosis is 64.534 showing substantial departure from normality since multivariate normality whose kurtosis value is greater than 5 deviated substantially from the norm. To handle the multivariate non-normality, bootstrapping procedure available in AMOS was used and the p = 0.135 indicates that the null hypothesis that the model is correct be accepted since the value is greater than 0.05. This shows that our model is fit.

Linearity and multicollinearity. To demonstrate that the variables are linearly dependent, deviation for linearity for all the predictor variables and the dependent variables were determined using SPSS. The values range between 0.075 - 0.976, which are greater than 0.05. This shows that the variables are linearly related. Also, a multicollinearity test was conducted among the independent variables using SPSS to ascertain if they are highly correlated, the collinearity statistics showed that the VIF value ranged between 1.04 - 1.43, which is less than 10. This assumption is not violated among the independent variables.
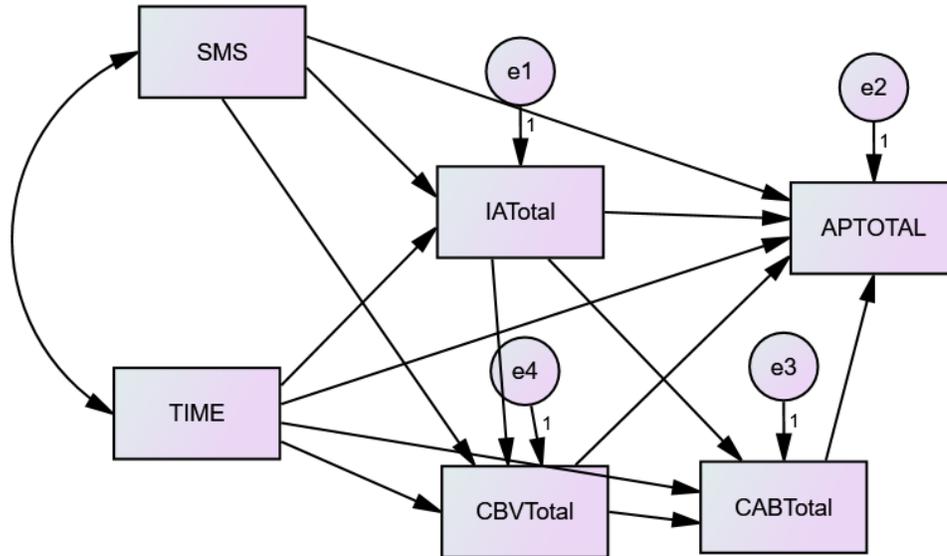

Figure 1. Conceptualized model. *SMS = number of social media sites registered with; TIME = time spent on social media; IATotal = Internet addiction; CBVTotal = cyber victimization; CABTotal = cyber aggression; APTOTAL= academic procrastination.

Results

Table 1
Respondents' Sample Characteristics

Variable		%
Gender	Male	27.8
	Female	72.2
Social media use	Yes	99.4
	No	.30
Number of social media sites used	0-1 social media sites	11.7
	2-3 social media sites	31.3
	4-5 social media sites	30.7
	6 and above social media sites	26.3
Time spent online daily	0-3 hours	62.5
	4-7 hours	29.6
	8-11 hours	5.0
	12 and above hours	2.9

Table 1 shows the demographic data of the respondents analyzed with percentages. 27.8% are male students, 72.2% are female students, 99.4% are social media users, more than 56% of the respondents are users of four or more social media sites, more than 35% of the students spend more than four hours online daily.

Table 2
Correlational Matrix of the Variables

Correlations						
	1	2	3	4	5	6
Cyber victimization	-					
Cyber aggression	$.552^{**}$	-				
Internet addiction	$.338^{**}$	$.229^{**}$	-			
Academic procrastination	$.114^{*}$	$.207^{**}$	$.332^{**}$	-		
Time spent on social sites	$.208^{**}$	-.012	$.280^{**}$	$.117^{*}$	-	
Number of social media sites used	$.144^{**}$	.021	$.245^{**}$	.047	$.155^{**}$	-

Note. ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 2 shows the correlation matrix of both the dependent and independent variables. CVB correlated significantly with CAB, IA, AP, TIME, and SMS. CAB is significantly related to IA and AP; IA is significantly related to AP, TIME, and SMS; AP is significantly related to TIME, and TIME is related to SMS.
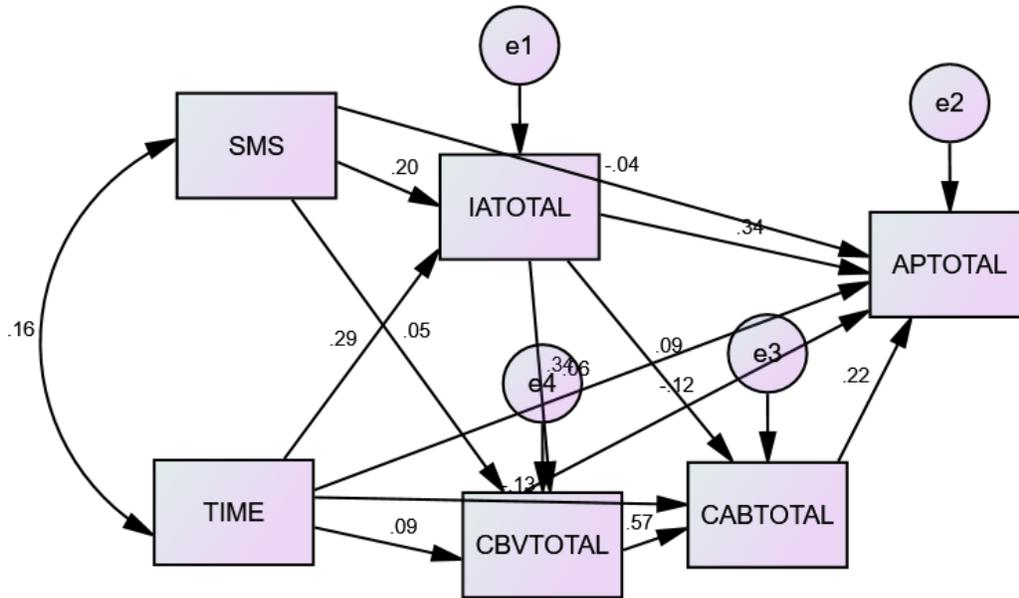
Does the Association of Social Media Use with Problematic Internet Behaviours Predict Undergraduate Students' Academic Procrastination?

8

Figure 2. The standardized path model for students' academic procrastination.

Table 3
Model Fit Statistics

Fit	Value	Cut-Off	Remark
Goodness of fit index (GFI)	.999	>0.90	good fit
Trucker Lewis index (TLI)	.962	>0.90	good fit
Comparative fit index (CFI)	.999	>0.90	good fit
Normed fit index (NFI)	.995	>0.90	good fit
Root mean square error of approximation (RMSEA)	.048	<0.08	good fit
Ratio of chi-square to degree of freedom (CMIN/DF)	2.171	< 5	good fit

Table 3 shows that the various tests are respectively consistent in suggesting that the hypothesized model represented an adequate fit to the data. Therefore, the hypothesized model proposed in the study fits the sample data satisfactorily.

Table 4

Regression Weights, Probability Values of the Variables of the Model

Parameter			Estimate	Lower	Upper	P
Internet addiction	<---	Number of social media sites used	.198	.120	.283	.002
Internet addiction	<---	Time spent on social media sites	.295	.210	.376	.002
Cyber victimization	<---	Time spent on social media sites	.091	-.024	.206	.116
Cyber victimization	<---	Number of social media sites used	.049	-.026	.124	.184
Cyber victimization	<---	Internet addiction	.335	.246	.425	.003
Cyber aggression	<---	Cyber victimization	.568	.390	.726	.004
Cyber aggression	<---	Time spent on social media sites	-.126	-.185	-.054	.002
Cyber aggression	<---	Internet addiction	.093	.004	.175	.045
Academic procrastination	<---	Internet addiction	.339	.230	.428	.003
Academic procrastination	<---	Cyber aggression	.221	.108	.348	.003
Academic procrastination	<---	Cyber victimization	-.121	-.243	.009	.070
Academic procrastination	<---	Time spent on social media sites	.055	-.040	.164	.322
Academic procrastination	<---	Number of social media sites used	-.040	-.127	.047	.319

Table 4 showed predictive powers of the independent variables on the dependent variables. SMS and TIME significantly predicted undergraduate students' IA (R^2 =.198, p<.05), and (R^2 =.295, p<.05) respectively. IA significantly predicted CVB (R^2 =.335, p<.05), and academic procrastination (R^2 =.339, p<.05) while CVB predicted significantly CAB (R^2 =.568, p<.05), and a negative non predictor of academic procrastination (R^2 =-.121, p>.05). CAB predicted academic procrastination (R^2 =.221, p<.05).

Table 5

Standardized Total Effects, Direct Effects, and Indirect Effects of the Variables in the Model

Variables	Total Effect	Direct Effect	Total Indirect Effect
Time spent in social media effect on academic procrastination	.134**	.055	.079**
Number of social media sites used effect on academic procrastination	.031	-.040	.072**
Cyber aggression on academic procrastination	.221**	.221**	.000
Cyber victimization effect on academic procrastination	.004	-.121**	.125**
Internet addiction effect on academic procrastination	.361**	.339**	.022

Note. ** Significant at the 0.05 level (2-tailed).

Table 5 shows the total, direct, and indirect effects of the variables on the endogenous (dependent) variables. TIME has a significant total and indirect effect (p<0.05) on their AP. It has no significant direct effect (p>0.05) on their AP. SMS has only a significant total indirect effect (p<0.05) on the AP without any significant direct and total effects on AP. CAB has significant total and direct effects (p<0.05) but no total significant indirect effect on their AP. CBV has significant total and direct effects (p<0.05) on AP. With regard to indirect effects, Table 4 represented the total indirect effects as computed by AMOS default and because AMOS by default does not have the capacity to estimate the specific indirect effects in multiple mediation (Perera, 2013), we estimated the specific indirect effects of the exogenous variables with the user defined *estimand* in AMOS as shown in Figure 3 and Table 6.
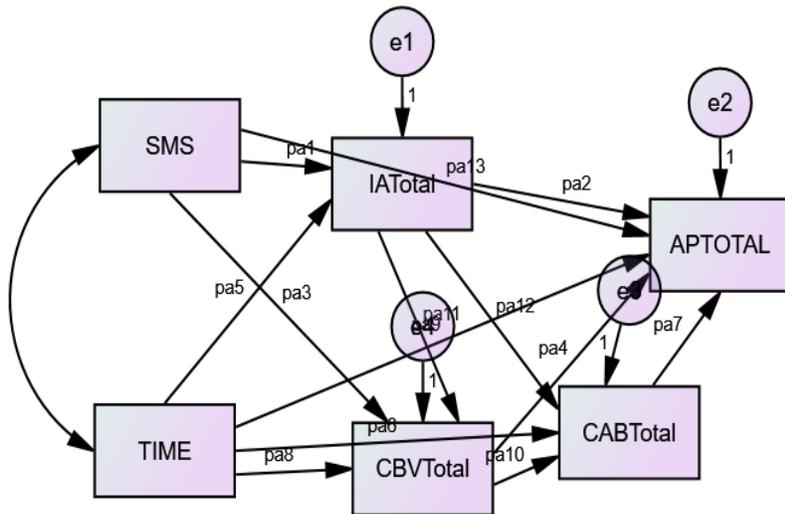

Figure 3. Path model for specific indirect paths. Estimated paths = ie1=pa1*pa2; ie2=pa5*pa2; ie3=pa3*pa4; ie4=pa8*pa4; ie5=pa6*pa7) where i.e.=indirect effect; pa=path.

Table 6
Specific Indirect Effects of SMS and TIME on Students' Academic Procrastination

Indirect Effects	Estimate	SE	95% CI		P
			LB	UB	
SMS on AP through IA	.493	.003	.278	.798	.002
TIME on AP through IA	1.006	.005	.619	1.551	.001
SMS on AP through CBV	-.043	.001	-.167	.019	.158
TIME on AP through CBV	-.111	.002	-.389	.022	.107
TIME on AP through CAB	-.279	.003	-.581	-.114	.001

Note: CI = confidence intervals; LB = lower bound; UB = upper bound; SE = standard error.

Table 6 showed that SMS and TIME had specific indirect effects on AP through IA while TIME had significant indirect effect on AP through CAB based on 1000 bootstrap sample at 95 bias-corrected confidence intervals. SMS and TIME had no significant indirect effects on AP through CBV and CAB.

Discussion

Our study proposed a model analysing the relationship patterns and directions between students' social media use (time spent on social media, the number of social media sites registered with), problematic Internet behaviours (cyber victimization, cyber aggression, Internet addiction), and their academic procrastination. The model fit indices showed that our hypothesized model fits the sample data satisfactorily. This shows that explaining academic procrastination in contemporary time could also be done when researchers look into what goes online where students spend most of their time either engaging in academics or social relationships. Engaging in social media activities, given its allure, could lead to procrastination when comprehensively examined from the angle of delaying or avoiding doing activities with higher long-term utility value to engage in more pleasurable activities with ultimately short-term utility (Siaputra, 2010). Our finding supports similar research which has shown that when social media use becomes problematic it positively predicts students' procrastination (Lian et al., 2018).

The correlation matrix in our study showed that there were significant positive relationships existing among time spent on social media, number of social media sites registered with, cyber victimization, cyber aggression, Internet addiction, and undergraduate students' academic procrastination. The finding indicated that time spent online is significantly positively related to Internet addiction. This shows that the more students spend their time in social media, the more they are likely to be addicted online. Similar findings, such as the findings in Al-Menayes' (2015) study, showed that time spent online is related to social media addiction. Simsek and Sali (2014) have also found that students who spend more time on social media have higher Internet addiction scores than those who do not. Although time students spent on social media predicted Internet addiction, it did not directly predict students' academic procrastination but had a significant positive indirect effect through Internet addiction on students' academic procrastination and a significant negative indirect effect through cyber-aggression. This has a lot to reveal concerning the relationship between time spent online and academic procrastination. It could mean that when time is spent appropriately online, for example, studying and doing assignments, it may not account for students' academic procrastination. This concurs with the fact that social media could enhance academic achievement when utilized as platforms for student's engagement (Mingle & Adams, 2015). However, when it becomes compulsive, it could derail students' attention to academic pursuits. This agrees with available literature that has shown that when time spent on social media becomes excessive or problematic, students procrastinate in their studies (Mingle & Adams, 2015). Positive relationship between Internet addiction and academic procrastination and the predictive power of Internet addiction on students' academic procrastination have been documented (Kandemir, 2014; Uzun, Unal, & Tokel, 2014). Furthermore, the significant negative indirect effect time has on students' AP through cyber-aggression indicate that proper use of time, such as productive interactions, could reduce students' aggression which in turn would reduce academic procrastination since TIME in our findings is a negative predictor of cyber-aggression.

We also found in our study that the number of social media sites used was significantly positively related to Internet addiction. It was also a significant predictor of Internet addiction.

The significant positive relationship could be explained from the point that registering and using many social media sites could lead to prolonged use. This points to the pragmatic factor in social media sites addiction that "emphasizes access and habituation variables in the development of specific addictions" (Kuss & Griffiths, 2011, p. 3532). There is the tendency that an individual will satisfy his/her curiosity with what goes on in those social media sites. Furthermore, our findings showed that the number of social media used is not a significant predictor of students' academic procrastination. Researchers are of the opinion that it is when social media is poorly managed that it can lead to academic problems (Azizi, Soroush, & Khatony, 2019). This may imply that other beneficial use of social media in academics could be intervening variables. However, the number of social media sites had an indirect effect on students' academic procrastination through Internet addiction. What this means is that the number of social media sites used could predict students' academic procrastination through Internet addiction. This could be interpreted to mean that the more students are addicted as a result of the number of social media sites used, the more they are likely to procrastinate their academic works. In a bid to meet up with activities in these sites there is the likelihood that more time is expended resulting in the postponement of duties related to their academic works.

An interesting finding was that the direct paths between students' social media use (TIME and SMS) and their academic procrastination were not significant but there existed a significant indirect effect among them through IA (positive effects) and CAB (negative effects for TIME only). This indicates that social media use is not inherently evil (Fernandes et al., 2019) and that a lot of advantages that can facilitate learning are attributed to proper use of social media (Mingles & Adams, 2015; Zamri et al., 2018).

Furthermore, our findings revealed that cyber victimization is significantly related to cyber aggression. Cyber victimization and cyber aggression appear to go hand-in-hand, indicating that a student who gets bullied might end up being so aggressive that he becomes a bully himself. This agrees with the conclusion of Ildirim, Calici, and Erdoğan (2017) when they found in their study that cyberbullying and cyber victimization are positive correlates of such psychological problems as hostility and impulsivity. There is the tendency that, without much thought, a student who is victimized could become enraged and revenge on the aggressor and may even become aggressive to others. Results showed that cyber victimization positively predicted cyber aggression among the students indicating that cyber victimization could account for students' aggressive behaviours online. Similarly, cyber aggression and cyber victimization had significant positive correlations with Internet addiction. Athanasiades, Kamariotis, Psalti, Baldry, and Sorrentin (2015) found a positive relationship between problematic Internet use and cyberbullying. Students who are cyber bullies may spend more time on the Internet as they are always on the lookout for who they will bully, resulting in this significant relationship.

More so, our analysis revealed that Internet addiction significantly positively predicted cyber victimization but not cyber aggression. This shows that the more one is addicted online, the more one is likely to be victimized online. Several studies have demonstrated how Internet addiction could negatively impact the psychological well-being of a child (Hou, Xiong, Jiang, Song, & Wang, 2019). There is the likelihood that the more time one spends online the more likely they are to meet bullies online (BioMed Central, 2018). Cyber aggression positively predicted academic procrastination. This could be explained by the fact that the time that should be devoted to studies may be directed to bullying online. Though researchers have concentrated

on the impact of cyberbullying on victims (Myers & Cowie, 2019), given that findings showed that cyber aggression is linked to academic procrastination, the cyberbully may delay academic work to engage in cyber aggression.

Conclusions and Limitations

This study aimed at building a casual model and estimating the direct, indirect, and total effects of social media use, problematic Internet related behaviours, and students' academic procrastination. Findings showed that social media use did not directly account for students' academic procrastination but indirectly did so through Internet addiction. It is concluded that the use of social media may not be inimical to students' academic endeavour until it is related to unhealthy online behaviours. This is very useful for intervention and prevention of academic procrastination among undergraduate students. Stakeholders should endeavour to build students' self-regulatory skills, encourage them to visit more educational sites that will enhance their academic activities, and advocate the establishment of healthy child-parent relationship that will enhance students' productive use of social media sites.

Although our findings have made significant contributions, our study is limited by a number of factors. First, our sample is primarily made up of female students who accounted for 72.2% of the sample size. The generalization of our findings could be limited since there might be a substantial gender difference and this study was based on a sample from a single university. This limits its generalizability. Based on this, further research from other universities needs to be conducted to confirm these findings. Second, newer instruments have emerged in Internet addiction evaluations given the advancement in knowledge. IAS may appear dated given the emergence of newer instruments. Though the IAS is widely validated and used (Anderson et al., 2017; Fernandes et al., 2019) newer instruments could be adopted in further studies.

<div align="center">References</div>

Abu Ghazal, M. (2012). Academic procrastination: Prevalence and causes from the point of view of undergraduate students. *The Jordanian Journal of the Educational Sciences, 8*, 131 149. Retrieved from journals.yu.edu.jo/jjes/Issues/2012/Vol8No2/4.pdf

Akhter, N. (2013). Relationship between Internet addiction and academic performance among university undergraduates. *Educational Research Review, 8*(19), 1793-1796. doi:10.5897/ERR2013.1539

Alassiri, A. A., Muda, M. B., Ghazali, R. B., & Ahamefula, U. C. (2014). Usage of social networking sites and technological impact on the interaction-enabling features. *The Special Issue on Contemporary Issues in Social Science, 4*(4), 46-61. Retrieved from http://www.ijhssnet.com/journals/Vol_4_No_4_Special_Issue_February_2014/6.pdf

Al-Menayes, J. J. (2015). Dimensions of social media addiction among university students in Kuwait. *Psychology and Behavioral Science, 4*(1), 23-28. doi:10.11648/j.pbs.20150401.14

Álvarez-García, D., Perez, J. C. N., Gonzale, A. D., Perez, C. R. (2015). Risk factors associated with cybervictimization in adolescence. *International Journal of Clinical and Health Psychology, 15*, 226-235. doi:10.1016/j.ijchp.2015.03.002

Anderson, E. L., Steen, E. & Stavropoulos, V. (2017). Internet use and problematic Internet use: A systematic review of longitudinal research trends in adolescence and emergent adulthood, *International Journal of Adolescence and Youth, 22*(4),430-454. doi:10.1080/02673843.2016.1227716

Athanasiades, C., Kamariotis, H., Psalti, A., Baldry, A. C. & Sorrentin, A. (2015). Internet use and cyberbullying among adolescent students in Greece: The "tabby" project. *Hellenic Journal of Psychology, 12*, 14-39. Retrieved from https://www.researchgate.net/publication/281202048

Azizi, S. M., Soroush, A., & Khatony, A. (2019). The relationship between social networking addiction and academic performance in Iranian students of medical sciences: A cross sectional study. *BMC Psychology, 7*(28), 1-8. doi:10.1186/s40359-019-0305-0

BaÂnyai, F., Zsila, A. Â., KiraÂly, O., Maraz, A., Elekes, Z., Griffiths, M. D., Andreassen, C. S., & Demetrovics, Z. (2017). Problematic social media use: Results from a large-scale nationally representative adolescent sample. *PLoS ONE, 12*(1), 1-13. doi:10.1371/journal.pone.0169839

Batool, S. S., Khursheed, S., & Jahangir, H. (2017). Academic procrastination as a product of low self-esteem: A mediational role of academic self-efficacy. *Pakistan Journal of Psychological Research, 32*(1), 195-211. Retrieved from https://pdfs.semanticscholar.org/d298/705cd882890eeebd5aad38e2e1dafb882411.pdf

BioMed Central. (2018, July). Longer hours on social media may increase teens' risk of cyberbullying. *ScienceDaily*. Retrieved from www.sciencedaily.com/releases/2018/07/180709202913.htm

Brown, C. F., Demaray, M. K., & Secord, S. M. (2014). Cyber victimization in middle school and relations to social emotional outcomes. *Computers in Human Behavior, 35,* 12–21. doi:10.1016/j.chb.2014.02.014

Carter, R. L. (2006). Solutions for missing data in structural equation modelling. *Research & Practice in Assessment, 1*, 4-7. Retrieved from https://files.eric.ed.gov/fulltext/EJ1062693.pdf

Cash, H., Rae, C. D., Steel, A. H., & Winkler, A. (2012). Internet addiction: A brief summary of research and practice. *Current Psychiatry Review, 8*(4), 292-298. doi:10.2174/157340012803520513

Cavusoglu, C., & Karatas, H. (2015). Academic procrastination of undergraduates: Self-determination theory and academic motivation. *Anthropologist, 20*(3), 735-743. Retrieved from http://krepublishers.com/02-Journals/T-Anth/Anth-20-0-000-15 Web/Anth-20-3-000-15-Abst-PDF/T-ANTH-20-3-735-15-1195-Cavusoglu-C/T-ANTH 20-3-735-15-1195-Cavusoglu-C-Tx[42].pdf

Deschamps, R., & Mcnutts, K. (2016). Cyberbullying: What's the problem? *Canadian Public Administration / Administration Publique du Canada, 59*(1), 45–71. doi:10.1111/capa.12159

Duru, E., & Balkis, M. (2017). Procrastination, self-esteem, academic performance, and well-being: A moderated mediation model. *International Journal of Educational Psychology, 6*(2), 97-119. doi:10.17583/ijep.2017.2584

Fernandes B., Maia, B. R., & Pontes, H. M. (2019). Internet addiction or problematic Internet use? Which term should be used? *Psicologia USP, 30*, 1-8. doi:10.1590/01036564e190020

Field, T. (2018). Cyberbullying: A narrative review. *Journal of Addiction Therapy Research, 2,* 10-27. doi:10.29328/journal.jatr.1001007

Garaigordobil, M. (2015). Psychometric properties of the cyberbullying test, a screening instrument to measure cyber victimization, cyber aggression, and cyber observation. *Journal of Interpersonal Violence*, 1–21. doi:10.1177/088626051560016

Goroshit M. & Hen, M. (2019). Academic procrastination and academic performance: Do learning disabilities matter? *Current Psychology*, 1-9. doi:10.1007/s12144-019-001833

Hou, Y., Xiong, D., Jiang, T., Song, L., & Wang, Q. (2019). Social media addiction: Its impact, mediation, and intervention. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 13*(1), article 4. doi:10.5817/CP2019-1-4

Ildirim, E., Çalici, C., Erdoğan, B. (2017). Psychological correlates of cyberbullying and cyber victimization. *The International Journal of Human and Behavioral Science, 3*(2), 721. doi:10.19148/ijhbs.365829

Kandemir, M. (2014). Predictors of academic procrastination: coping with stress, Internet addiction and academic motivation. *World Applied Sciences Journal, 32*(5), 930-938. doi:10.5829/idosi.wasj.2014.32.05.60

Kármen, D., Kinga, S., Edit, M., Susana, F., Kinga, K. J., & Réka, J. (2015). Associations between academic performance, academic attitudes, and procrastination in a sample of undergraduate students attending different educational forms. *Procedia - Social and Behavioral Sciences, 187*, 45–49. Retrieved from https://core.ac.uk/download/pdf/82608258.pdf

Kim, J.-E. & Nembhard, D. A. (2019). The impact of procrastination on engineering students' academic performance. *International Journal of Engineering Education, 35*(4), 1008 1017. Retrieved from https://www.researchgate.net/publication/334729845

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York, NY, US: Guilford Press. Retrieved from 158.208.129.61 › suzuki.

Kuss, D. J., & Griffiths, M. D. (2011). Online social networking and addiction—A review of the psychological literature. *International Journal of Environmental Research and Public Health, 8*, 3528-3552. doi:10.3390/ijerph8093528

Krishnamurthy, S., & Chetlapalli, S. K. (2015). Internet addiction: Prevalence and risk factors: A cross-sectional study among college students in Bengaluru, the Silicon Valley of India. *Indian Journal of Public Health, 59*(2), 115-121. doi:10.4103/001957X.157531

La Barbera, D., La Paglia, F., & Valsavoia, R. (2009). Social network and addiction. *Annual Review of Cybertherapy and Telemedicine, 7,* I2-36. doi:10.3233/978-1-60750-017-933

Lapierre, K. R., & Dane, A. V. (2020). Cyberbullying, cyber aggression, and cyber victimization in relation to adolescents' dating and sexual behavior: An evolutionary perspective. *Aggressive Behavior*, *46*, 49–59. doi:10.1002/ab.21864

Lian, S.-L., Sun, X.-J., Zhou, Z.-K., Fan, C.-Y., Niu, G.-F., & Liu, Q.-Q. (2018). Social networking site addiction and undergraduate students' irrational procrastination: The mediating role of social networking site fatigue and the moderating role of effortful control. PLoS ON *13*(12), 1-20. doi:10.1371/journal.pone.0208162

Ma, H. K. (2011). Internet addiction and antisocial Internet behaviour of adolescents. *The Scientific World Journal, 11,* 2187–2196. doi:10.1100/2011/308631

Mahasneh, A. M., Bataineh, O. M., & Al-Zoubi, Z. H. (2016). The relationship between academic procrastination and parenting styles among Jordanian undergraduate university students. *The Open Psychology Journal, 9*, 25-34. doi:10.2174/1874350101609010025

Manning, J. (2014). Social media, definition, and classes of. In K. Harvey (Ed.), *Encyclopedia of social media and politics* (pp. 1158-1162). Thousand Oaks, CA: Sage. Retrieved from https://www.researchgate.net/publication/290514612

Mingle, J., & Adams, M. (2015). Social media network participation and academic performance in senior high schools in Ghana. *Library Philosophy and Practice (e-journal),* 1-52. Retrieved from http://digitalcommons.unl.edu/libphilprac/1286

Muslikah, M., & Andriyani, A. (2018). Social media user students' academic procrastination. P*sikopedagogia Jurnal Bimbingan Dan Konseling, 7*(2), 53-57. Retrieved from https://www.researchgate.net/publication/335309904

Mustafa, S. E. & Hamzah, A. (2011). Online social networking: A new form of social interaction. *International Journal of Social Science and Humanity, 1*(2), 96-104. doi:10.7763/IJSSH.2011.V1.17

Myers, C.-A. & Cowie, H. (2019). Cyberbullying across the lifespan of education: Issues and interventions from school to university. *International Journal of Environmental Research and Public Health, 16*, 1-14. doi:10.3390/ijerph16071217

Nikolopoulou, K. (2018). Creativity and ICT: Theoretical approaches and perspectives in school education. In T. A. Mikropoulos (ed.), *Research on e-Learning and ICT in Education* (p.87-100). doi:10.1007/978-3-319-95059-4_5

Nixon, C. L. (2014). Current perspectives: the impact of cyberbullying on adolescent health. *Adolescent Health, Medicine and Therapeutics, 5*, 143 – 158. doi:10.2147/AHMT.S36456

Nwosu, K. C., Ementa, C. N., & Ejikeme, P. E. (2018). Cyberbullying among undergraduate students in a Nigerian University: Awareness and incidence. *Romanian Journal of Psychological Studies, 6*(1), 43-58.

Oskouei, R. J., & Sharma, R. (2013). *The relationship between Internet usage behavior and health problems*. Amrita International Conference of Women in Computing. Retrieved form: https://www.researchgate.net/publication/235781479

Ozer, B. U., & Sackes, M. (2011). Effects of academic procrastination on college students' life satisfaction. *Procedia Social and Behavioral Sciences, 12*, 512–519. doi:10.1016/j.sbspro.2011.02.063

Perera, H. N. (2013). A novel approach to estimating and testing specific mediation effects in educational research: Explication and application of Macho and Ledermann's (2011) phantom model approach. *International Journal of Quantitative Research in Education, 1*(1), 39-60. doi:10.1504/ijqre.2013.055640

Powell, P. W., Gray, G., & Reese, M. K. (2013) Connecting with others: A qualitative study of online social networking site usage. *The Practitioner Scholar: Journal of Counseling and Professional Psychology, 2,* 52-67.

Reinecke, L., Meier, A., Aufenanger, S., Beutel, M. E., Dreier, M., Quiring, O., Stark, B., Wölfling, K., & Müller, K. W. (2018). Permanently online and permanently procrastinating? The mediating role of Internet use for the effects of trait procrastination on psychological health and well-being. *New Media & Society, 20*(3), 862 –880. doi:10.1177/1461444816675437

Ridings, C. M. & Gefen, D. (2004). Virtual community attraction: Why people hang out online. *Journal of Computer-Mediated Communication, 10*(1). doi:10.1111/j.10836101.2004.tb00229.x

Saleem, M., Owaisi, A. M., & Tufail, M. W. (2015). Internet addiction: It's impact on procrastination of higher learning students in Pakistan. *The Sindh University Journal of Education, 44*(2), 205-230. Retrieved from https://www.psychologistpanel.com/internet-addiction-its-impact-on-procrastination-of-higher-learning-students-in-pakistan/

Savoldi, F., & Ferraz de Abreu, P. (2016). Bullying, cyberbullying and Internet usage among young people in post-conflict Belfast. *Cogent Social Sciences, 2,* 1-10. doi:10.1080/23311886.2015.1132985

Shao, Y. J., Zheng, T., Wang, Y. Q., Liu, L., Chen, Y., & Yao, Y. S. (2018). Internet addiction detection rate among college students in the People's Republic of China: A meta analysis. *Child and Adolescent Psychiatry and Mental Health, 12*(25). doi:10.1186/s13034 018-0231-6

Shaw, M., & Black, D. W. (2008). Internet addiction definition, assessment, epidemiology, and clinical management. *CNS Drugs, 22*(5), 353-365. doi:10.2165/00023210-20082205000001

Siaputra, I. (2010). Temporal motivation theory: Best theory (yet) to explain procrastination. *Anima Indonesian Psychological Journal, 25*(3), 206-214. Retrieved from *repository.ubaya.ac.id › V_025_N_003_A_007*

Simsek, E., & Sali, J. B. (2014). The role of internet addiction and social media membership on university students' psychological capital. *Contemporary Educational Technology, 5*(3), 239-256. Retrieved from: https://files.eric.ed.gov ›fulltext

Sirin, E. F. (2011). Academic procrastination among undergraduates attending school of physical education and sports: Role of general procrastination, academic motivation, and academic self efficacy. *Educational Research and Reviews, 6*(5), 447-455. Retrieved from http://www.academicjournals.org/ERR

Sourander, A., Brunstein-Klomek, A., Helenius, H., Ikonen, M., Lindroos, J., Luntamo, T. & Koskelainen, M. (2010). Psychosocial Risk Factors Associated With Cyberbullying Among Adolescents. *Archives of General Psychiatry, 67*(7), 720-728. doi:10.1001/archgenpsychiatry.2010.79

Spada, M. M. (2014:5). An overview of problematic Internet use. *Addictive Behaviors, 39*, 3–6. doi.org/10.1016/j.addbeh.2013.09.007

Steel, P., & Konig, C. J. (2006). Integrating theories of motivation. *Academy of Management Review, 31*(4), 889–913. Retrieved from: https://web.mit.edu/curhan/www/docs/ Articles/ 15341_Readings/Motivation/Steel_%26Konig_2006_Integrating_ theories_of_motivation.pdf

Steel, P., Svartdal, F., Thundiyil, T., & Brothen, T. (2018). Examining procrastination across multiple goal stages: A longitudinal study of temporal motivation theory. *Frontiers in Psychology, 9*(327), 1-16. doi:10.3389/fpsyg.2018.00327

Uzun, A. N., Unal, E., & Tokel, S. E. (2014). Exploring Internet addiction, academic procrastination, and general procrastination among pre-service ICT teachers. *Mevlana International Journal of Education (MIJE), 4*(1), 189-201. doi:10.13054/mije.14.18.4.1

Vargas, M. A. P. (2017). Academic procrastination: The case of Mexican researchers in psychology. *American journal of education and learning, 2*(2), 103-120. doi:10.20448/804.2.2.103.120

Xin, M., Xing, J., Pengfei, W., Houru, Mengcheng, W., & Hong, Z. (2018). Online activities, prevalence of Internet addiction and risk factors related to family and school among adolescents in China. *Addictive Behaviours Reports, 7*, 14-18. doi:10.1016/j.abrep.2017.10.003

Yang, Z., Asbury, K., & Griffiths, M. D. (2018). An exploration of problematic smartphone use among Chinese university students: Associations with academic anxiety, academic procrastination, self-regulation, and subjective wellbeing. *International Journal of Mental Health Addiction,* 1-19. doi:10.1007/s11469-018-9961-1

Young, K. S. (1998). Internet addiction Test (IAT) Manual. Retrieved from http://cyberpsy.ru/wp-content/uploads/2018/02/iat-manual.pdf

Yushau, B., Mji, A., & Wessels, D. C. J. (2005). The role of technology in fostering creativity in the teaching and learning of mathematics. *Pythagoras, 62,* 12-22. doi:10.4102/pythagoras.v0i62.110

Zamri, N. S., Zaihan, N. A., & Samat, M. F. (2018). *A review on social media usage among students*. Konvensyen Kebangsaan Pemimpin Pelajar. Retrieved from https://www.researchgate.net/publication/329388805

Authors

Kingsley Chinaza Nwosu, PhD, teaches educational psychology courses in the Department of Educational Foundations, Nnamdi Azikiwe University, Awka, Nigeria. His research interests center on inclusive education, students' belief system and family dynamism, cognitive education, digital technology, and human learning. Email: kc.nwosu@unizik.edu.ng.

Dr. O.I. Ikwuka is a lecturer in the Department of Educational Foundations, Nnamdi Azikiwe University, Awka, Nigeria. She is a former head of the department. She holds a PhD in Educational Technology and for almost a decade has been researching on the adoption of digital technologies in Nigerian classrooms. Email: oi.ikwuka@unizik.edu.ng.

Mary Ugorji Onyinyechi is a postgraduate student in the Department of Educational Foundations, Nnamdi Azikiwe University, Awka, Nigeria. She has a passionate interest in Educational Psychology. Her research interest centres on peer influence in digital platforms. She is a student member of the Nigerian Council of Educational Psychologists. Email: maryugorji2009@gmail.com.

Gabriel Chidi Unachukwu PhD, is a full professor in the Department of Educational Foundations, Nnamdi Azikiwe University, Awka, Nigeria. He has been in the forefront of promoting research in educational psychology in Nigeria. He conducts research on inclusive education, child development, and human learning. He is a fellow of the Nigerian Academy of Education. Email: gabbyunas@gmail.com.