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Does Facebook intensity matter for academic self-efficacy? A path analytic approach

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Abstract

There is mixed evidence about the educational impacts of Facebook with some research indicating how using Facebook facilitates academic outcomes while other investigations showing the link of Facebook usage to maladaptive educational outcomes such as reduced academic self-efficacy and performance. Prior studies also paid much attention to the academic-related consequences of this social networking in Western societies such as the United States which might have limited generalizability to students from non-Western countries. This study contributes to this line evidence by exploring whether Facebook use intensity dimensions would predict academic self-efficacy and study habits in selected Filipino undergraduate students using a path analytic approach. A survey packet comprising questionnaires about Facebook use and academic self-efficacy was administered to 566 Filipino undergraduate students. Results of path analysis via full maximum likelihood estimation approach demonstrated that whereas self-expression positively predicted academic self-efficacy, overuse negatively predicted this outcome. Boredom positively predicted study habits. This research has implications for understanding how different motives of using social media platforms can influence academic behaviors in higher education contexts.

Keywords: Academic self-efficacy, Facebook intensity, Filipino university students

Introduction

Facebook is one of the most widely used social networking sites across the globe. In fact, data from Statista shows that there have been more than 2.9 billion active users of Facebook worldwide (Dixon, 2022). This social networking site has gained so much attention as it serves as a platform for initiating and maintaining social ties in various domains (Balog et al., 2015; Dhir & Torsheim, 2016; Ellison et al., 2007). Given the popularity of Facebook as a tool for communication, collaboration, and other online interactive activities,



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researchers and practitioners have become equally interested in exploring how using this social media platform impacts on academic outcomes in youth.

Extant literature has portrayed a complicated and inconsistent pattern on how using Facebook predicts academic-related behaviors. On the one hand, studies have demonstrated that Facebook use was associated with increased academic performance (Ainin et al., 2015; Yu et al., 2010), verbal ability (Alloway et al., 2013; Arteaga Sánchez et al., 2014; Dhir et al., 2017), cognitive and metacognitive techniques (Lin et al., 2013), and capabilities to understand academic codes (Cuesta et al., 2016), academic engagement (Datu et al., 2018; Heiberger & Harper, 2008), and academic higher self-efficacy (Boahene et al., 2019). On the other hand, using Facebook has been linked to reduced academic performance (Boahene et al., 2019; Frein et al., 2013; Hassell & Sukalish, 2017; Junco, 2012b; Kirschner & Karpinski, 2010; Malik et al., 2021), lower academic self-efficacy (Hassell & Sukalish, 2017), satisfaction with university life (Yu et al., 2010), maladjustment in university life (Closson & Bond, 2019), and decreased academic engagement (Junco, 2012a). Further, a meta-analytic review has shown that using Facebook depleted academic achievement (Marker et al., 2018). Other investigations indicate the absence of a relationship between Facebook use and academic achievement (Appel et al., 2020; Kolek & Saunders, 2008; Pasek et al., 2009). Indeed, more investigations are needed to understand the academic-related impacts of Facebook use.

Importantly, there are key research gaps that remained unfilled by previous investigations. The evidence on how Facebook usage is associated with academic self-efficacy seems inconclusive with one study demonstrating a positive relationship between academic self-efficacy in selected undergraduate students in Ghana (Boahene et al., 2019), while another investigation showing a negative correlation between Facebook usage and this outcome among undergraduate students in the United States (Hassell & Sukalish, 2017). Given the mixed evidence on how Facebook use relates to academic self-efficacy, it remains unclear whether using this social media platform may affect students' confidence in performing academic-related activities. In addition, although past studies have shown the relationships of Facebook use to different academic behaviors such as academic performance (Junco, 2012b; Malik et al., 2021) and engagement (Datu et al., 2018), there has been limited research on how using Facebook correlates with other indicators of effective educational activities such as the amount of time spent on academic-related tasks. If left unaddressed, it may be challenging to understand the potential impacts of Facebook use on other equally important academic outcomes. Further, even if there were investigations demonstrating the links of Facebook to academic self-efficacy, these studies relied on either a single-item questionnaire (Hassell & Sukalish, 2017) or a unidimensional model of Facebook use (Boahene et al., 2019). A related study that explored the link of Facebook use with general self-efficacy using frequency of status updates and frequency of use in the said platform,

demonstrated that Facebook use was related to lower levels of general self-efficacy (Kim, 2014). As results of these studies might generate inadequate insights on how different aspects and motives for Facebook use may predict academic self-efficacy, this research adopted a multidimensional model of Facebook use (Orosz et al., 2016) to offer a more nuanced approach in understanding the role that Facebook use plays in students' academic outcomes.

The four-factor model of Facebook intensity (Orosz et al., 2016) has argued that there are four dimensions that could characterize the use of Facebook, namely – boredom, overuse, persistence, and self-expression. Boredom refers to the degree to which individuals use Facebook to overcome their feelings of boredom. Overuse pertains to the excessive and maladaptive use of Facebook. Persistence involves exhibiting an elevated frequency of Facebook usage, which may define the user's attachment to using this social networking platform. Self-expression entails conveying personal beliefs and values through Facebook posts, comments, and other relevant online behaviors. Past investigations have demonstrated that Facebook intensity dimensions were differentially linked to passion for using Facebook (Orosz et al., 2016) and academic engagement (Datu et al., 2018). Lastly, as prior studies paid attention to the relationships of Facebook use to academic self-efficacy in other cultural contexts such as the United States (Hassell & Sukalish, 2017) and Ghana (Boahene et al., 2019), findings may not be generalizable in other non-Western and Asian societies (Boahene et al., 2019; Hassell & Sukalish, 2017). Investigating how Facebook use relates to other non-Western cultures (e.g., the Philippines) is an important scholarly initiative to offer more detailed insights regarding the potential academic benefits or hazards of using this social media platform in various cultural contexts.

Exploring the role of the Facebook use dimension in Filipino undergraduate students' academic self-efficacy and study habits is important for a number of reasons. Given that Statista has reported around 76 million Facebook users in the Philippines in 2021, with a leading factor on being a platform for social interaction and connecting with distant families and friends (Statista Research Department, 2021), it is likely that results may generate insights about the educational impacts of using this social media platform in this context. Moreover, as prior research showed that using Facebook to cope with boredom was related to increased academic engagement in Filipino undergraduate students (Datu et al., 2018), findings can provide additional evidence on how specific dimensions of Facebook use intensity predict key educational outcomes.

Therefore, this study aims to examine the associations of Facebook use dimensions with academic self-efficacy and study habits among self-efficacy Filipino undergraduate students via a path analytic approach. We assessed the links of Facebook use intensity with academic self-efficacy, which refers to perceived confidence in performing academic

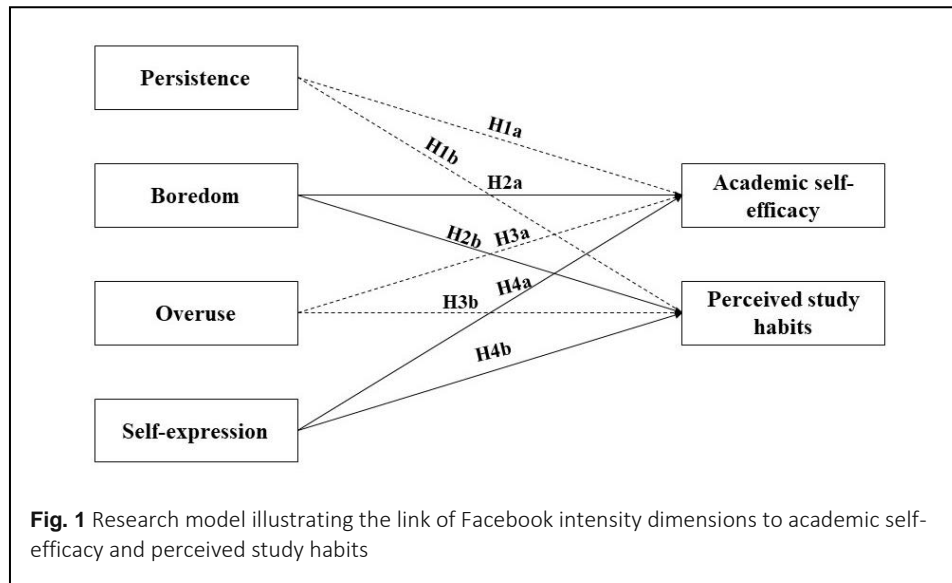
activities such as reviewing learning materials and taking examinations (Chelmers et al., 2001), given that prior studies demonstrated the relationship of using Facebook with this educational construct (Boahene et al., 2019; Hassell & Sukalish, 2017). Building on past research on the links of using Facebook to academic achievement (Junco, 2012b; Malik et al., 2021) and engagement (Datu et al., 2018), we also investigated the role Facebook use in perceived student habits in order to generate additional insights on how using this social media tool might predict study-related behaviors. Specifically, this research hopes to address the following research questions:

1. Do Facebook intensity dimensions predict academic self-efficacy?
2. Do Facebook intensity dimensions predict perceived study habits?

Theoretical background and hypothesis

This study relies on two theories to rationalize the links of Facebook use dimensions to academic self-efficacy and study habits. Firstly, the basic psychological needs satisfaction theory (Ryan & Deci, 2000, 2017) has argued that human beings are fundamentally driven to fulfill basic psychological needs for autonomy (i.e., capacity to have a sense of personal agency or choice in performing specific tasks), relatedness (i.e., desire to have meaningful social connections), and competence (i.e., sense of effectiveness or mastery in a specific domain of performance) and to the extent to which these needs are satisfied, individuals can achieve higher levels of optimal psychological health. For example, if using Facebook provides an opportunity to express personal values and beliefs (Datu et al., 2018), which constitutes the self-expression dimension of multidimensional intensity, it is likely that using this platform may promote satisfaction of the basic needs for autonomy which in turn may be linked to higher levels of academic self-efficacy and study habits. Further, as the boredom dimension of Facebook use involves utilizing Facebook to avoid getting bored with specific tasks, it is plausible that this dimension may help fulfil basic needs for competence which may be linked to increased academic self-efficacy and study behaviors. In addition, given that the persistence dimension covers the users' sense of attachment in terms of using this social media platform, it is likely that Facebook may serve as a pathway towards satisfying basic needs for relatedness, which in turn might be associated with adaptive academic outcomes. Therefore, this study anticipates that three dimensions of Facebook intensity, namely: (a) persistence; (b) boredom; and (c) self-expression, may positively predict academic self-efficacy and study habits (i.e., H1a, H1b, H2a, H2b, H4a, and H4b).

Secondly, stressor-strain-outcome (Cheung & Tang, 2010; Shi et al., 2020) has conceptualized the roles of environmental stimuli (i.e., stressor) in increasing undesirable psychological reactions (i.e., strain), which in turn catalyzes undesirable outcomes. If Facebook features or stimuli (e.g., excessive notifications about friends' new posts) result



in maladaptive reactions (e.g., anxiety and excessive dependence), it is likely that Facebook can lead to undesirable academic functioning. As the overuse dimension of Facebook intensity is characterized by excessive use of this social media platform (Orosz et al., 2016), it is likely that this dimension may negatively predict both academic self-efficacy and study habits (H3a, and H3b). Figure 1 illustrates this study's research model.

Methods

Participants

The sample comprised 566 Filipino undergraduate students from a private collegiate institution in a rural area in the Philippines. These participants were recruited via a convenience sampling approach in which participants who were available during the time of data collection were invited to fill in a consent form and answer a paper-and-pencil version of a survey. The average age of the participants was 19.59, with a standard deviation value of 3.52. There were 338 female and 228 male participants. Ethical clearance from the institutional human research ethics committee of the authors' university was sought before actual data collection. Participants returned consent forms that indicated that they voluntarily agreed to participate in this study.

Measures

Multidimensional Facebook Intensity Scale. The 13-item Multidimensional Facebook Intensity Scale (Orosz et al., 2016) was used to measure the extent to which the participants exhibited boredom, overuse, persistence, and self-expression. Sample items in each subscale include: "When I'm bored, I often go to Facebook" (boredom); "I spent time on

Facebook at the expense of my obligations” (overuse); “I feel bad if I don’t check my Facebook daily” (persistence); and “I like refining my Facebook profile” (self-expression). Items were marked on a 5-point Likert scale (1 = *Strongly disagree*; 5 = *Strongly agree*). Orosz et al. (2016) have provided evidence about the psychometric validity of this scale in undergraduate student and adult samples in Hungary. Result of confirmatory factor analysis showed that the scale had acceptable fit in this study: $\chi^2 = 274.25$, Comparative fit index (CFI) = .96, Tucker-Lewis index (TLI) = .94, Root mean square error of approximation (RMSEA) = .085 (.075, .095), and Standardized root mean square residual (SRMR) = .05. The Omega coefficients of boredom, overuse, persistence, and self-expression subscales were .85, .85, .81, and .89.

Academic Self-Efficacy Scale. The 8-item Academic Self-Efficacy Scale (Chemers et al., 2001) was used to assess the participants’ perceived capability in doing academic tasks. The items were rated on a 7-point Likert scale (1 = *Strongly disagree*; 7 = *Strongly agree*). Sample items in the scale include: “I know how to study to perform well on tests.” and “I am very capable of succeeding at this college.” Chelmers et al. (2001) have shown that this scale had adequate psychometric properties in selected undergraduate students in the United States. Result of confirmatory factor analysis showed that the scale had acceptable fit in the current research: $\chi^2 = 55.08$, CFI = .98, TLI = .97, RMSEA = .076 (.056, .097), and SRMR = .03. The Omega coefficient of the scale in this study was .93.

Study habits. The participants were requested to indicate the average number of hours they were spending weekly on academic-related activities such as completing homework, reviewing past lessons, and reading books.

Data analyses

Descriptive statistics like mean and standard deviation for Facebook intensity dimensions, academic self-efficacy, and study habits were computed using the Statistical Package for the Social Sciences (SPSS 25v). Confirmatory factor analyses were carried out to provide evidence about the psychometric validity of the scales used to measure the Facebook intensity and academic self-efficacy. The Omega coefficients were calculated using JASP software to provide estimates of scales’ reliabilities, as prior research indicates that it is a more methodologically rigorous approach than Cronbach’s alpha coefficient (Revelle & Zinbarg, 2009). Pearson-r correlation coefficients were computed to assess the zero-order correlations between each Facebook intensity dimension (i.e., boredom, overuse, persistence, and self-expression) and outcomes (i.e., academic self-efficacy and study habits). To address hypotheses in this study, path analysis via full information maximum likelihood estimation approach was conducted via Analysis of Moment Structure (AMOS 25v). The hypothesized path model simultaneously tested the direct effects of all Facebook intensity dimensions on academic self-efficacy and study habits. Although prior research

has pointed out that the most acceptable range of fit indices for measurement and structural models remains debatable (Lance et al., 2006), we adopted Byrne's (2010) recommended cut-off values: (1) CFI and TLI greater than .90, and (2) RMSEA and SRMR lower than .08 given that it is a widely used methodological guideline in educational research.

Results

The results of descriptive statistics and reliability are shown in Table 1. All subscales of Facebook intensity (i.e., boredom, overuse, persistence, and self-expression) and academic self-efficacy were reliable based on a review of their respective Omega coefficients. Results of correlational analyses showed that all dimensions of Facebook intensity were not correlated with academic self-efficacy. Further, persistence, overuse, and self-expression were negatively correlated with study habits. Academic self-efficacy was positively correlated with study habits.

Before conducting path analyses, we checked whether key assumptions in performing this analytic approach were satisfactorily met. There was evidence supporting the linear relationship between Facebook use dimensions and outcomes. A review of Variance Inflation Factor values between Facebook use domains and outcomes indicated the absence of multicollinearity as the values did not exceed 10.0. Although tests of univariate normality indicated that all dimensions of Facebook use intensity and academic self-efficacy are normally distributed as the absolute values of skewness and kurtosis fell within the acceptable range of values (i.e., 2 for skewness and 7 for kurtosis) proposed by Finney and DiStefano (2008), perceived study habits had high skewness (15.70) and kurtosis (24.37). The Mardia's coefficient was also 19, which exceeded the recommended value to conclude multivariate normality. Hence, we adopted the natural log data transformation technique which serves as the original distribution of study habit scores that seemed to indicate normal distribution (Tabachnick & Fidell, 2001). The assumption regarding the independence of errors was also satisfied as there were no indications of substantial deviation of error terms in all predictor variables in this study.

Table 1 Descriptive statistics and reliability coefficients among the variables

	Scale	ω	M	SD	1	2	3	4	5	6
Persistence	1-5	.81	3.00	1.00	-					
Boredom	1-5	.85	3.30	.97	.75***	-				
Overuse	1-5	.85	2.91	1.01	.85***	.70***	-			
Self-expression	1-5	.89	2.82	.99	.85***	.67***	.83***	-		
Academic self-efficacy	1-5	.93	5.37	.87	-.04	-.01	-.06	.01	-	
Study Habits	NA	-	23.36	14.74	-.14***	.05	-.12**	-.14***	.09*	-

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Table 2 Unstandardized path coefficients in the hypothesized structural model

Paths	Scale	B	SE	CR
Persistence	academic self-efficacy	-.09	.09	-1.09
Boredom	academic self-efficacy	.04	.06	.68
Overuse	academic self-efficacy	-.16*	.08	-2.14
Self-expression	academic self-efficacy	.20**	.08	2.69
Persistence	study habits	-2.30	1.44	-1.59
Boredom	study habits	2.01*	.98	2.05
Overuse	study habits	.03	1.27	.02
Self-expression	study habits	-1.39	1.26	-1.09

Note: ** $p < .01$, * $p < .05$

Path analysis via full information maximum likelihood estimation approach indicates that hypothesized model had good fit: $\chi^2 = 5.31$, $df = 1$, $p < .001$, $CFI = .998$, $TLI = .969$, and $RMSEA = .08$ (.027, .166). Path coefficients are reported in Table 2. Both Hypothesis 1a (H1a) and Hypothesis 1b (H1b) were not supported as persistence did not predict academic self-efficacy and study habits. Whereas Hypothesis 2a (H2a) was not confirmed given the non-significant path from boredom to academic self-efficacy, this Facebook intensity facet positively predicted study habits which corroborated Hypothesis 2b (H2b). Hypothesis 3a (H3a) was supported as overuse negatively predicted academic self-efficacy. However, Hypothesis 3b (H3b) was not confirmed given the non-significant path from overuse to study habits. Hypothesis 4a (H4a) was supported as self-expression positively predicted academic self-efficacy. However, given that self-expression did not predict study habits, Hypothesis 4b (H4b) was not confirmed. Figure 2 illustrates the path model in this study.

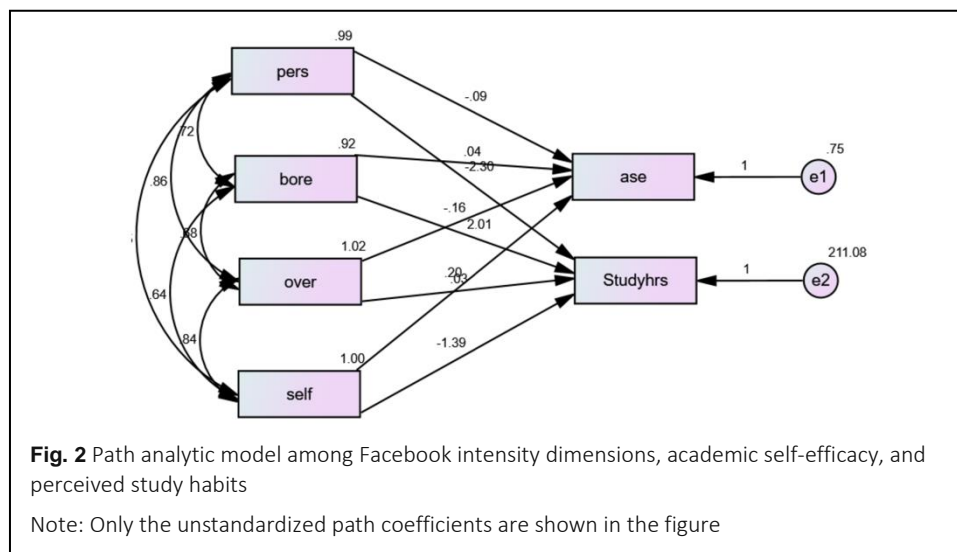


Fig. 2 Path analytic model among Facebook intensity dimensions, academic self-efficacy, and perceived study habits

Note: Only the unstandardized path coefficients are shown in the figure

Discussion

There is mixed evidence about the educational impacts of Facebook use, with some research indicating its beneficial role on key educational outcomes (Ainin et al., 2015; Heiberger & Harper, 2008; Yu et al., 2010) while other studies showcasing its ‘detrimental’ academic consequences (Frein et al., 2013; Hassell & Sukalish, 2017; Junco, 2012b; Kirschner & Karpinski, 2010; Malik et al., 2021). This inconsistent pattern of findings has also been apparent on how Facebook use relates to academic self-efficacy in various societies as prior studies have shown that using this social media site was linked to increased academic self-efficacy in Ghana (Boahene et al., 2019) but decreased self-efficacy in the United States (Hassell & Sukalish, 2017). Against this backdrop, this research investigated the role of Facebook use dimensions in academic self-efficacy and perceived study habits in selected Filipino undergraduate students via a path analytic approach.

The present research showed that self-expression positively predicted academic self-efficacy. This indicates that the inclination of students to use Facebook as a means for conveying personal views and opinions may be linked to higher levels of perceived capability to perform academic tasks. These findings were in line with the results of Orosz et al. (2016) and Datu et al. (2018) regarding the adaptive nature of the self-expression dimension of Facebook intensity. It is likely that self-expression may relate to academic self-efficacy because Niemiec and Ryan (2009) have pointed out that providing opportunities to fulfill needs for autonomy or the freedom to engage in self-determined actions may lead to optimal psychological functioning.

Boredom positively predicted study habits. This implies that students who are using Facebook to avoid experiencing boredom are inclined to spend more time studying or engaging in academic activities. This result corroborated the study of Datu et al. (2018) who showed that boredom was positively associated with student engagement. It is therefore possible that Facebook may be used as a pedagogical tool to protect students from experiencing boredom in school-related tasks. However, future research is warranted to formally test this prediction.

Overuse negatively predicted academic self-efficacy. This result suggests that the maladaptive use of Facebook may be associated with lower levels of perceived capabilities to carry out school-related tasks. This resembled the findings of Datu et al. (2018) who showed that overuse was associated with a lower degree of academic engagement. Consistent with the *stressor-strain-outcome* model (Cheung & Tang, 2010; Shi et al., 2020), if Facebook evokes stimuli that generate maladaptive responses or reactions (e.g., excessive dependence and anxiety), it is likely that using this social media platform can result in undesirable academic, social, and psychological outcomes.

Taken together, results of the current investigation suggest that different facets of Facebook intensity may have important implications for students' academic functioning. Whereas previous literature has emphasized that the ability of Facebook to promote social connectedness could account for the adaptive role of this social networking site in academic contexts, this research demonstrated that different personal motives for using Facebook may influence relevant educational outcomes. Specifically, using Facebook to express one's opinions, beliefs, and values and to avoid boredom may promote students' confidence in performing a wide range of academic tasks. Result also points to the academic-related hazards associated with excessive use of Facebook.

Indeed, this study contributes to inconsistent evidence (Boahene et al., 2019; Hassell & Sukalish, 2017) on how Facebook use and academic self-efficacy. A potential reason that accounts for the beneficial roles of self-expression and boredom in perceived confidence in carrying out academic activities in the Philippine context involves the popularity of using this social media platform in this setting. As of June 2020, Statista estimates that around 31.80% of Facebook users belong to the youth age group (i.e., 18 to 24 years). Further, some basic and higher education institutions have also advocated for implementing school-related activities (i.e., informal consultations, sharing marketing or promotional materials, and other school announcements) via Facebook. In other words, to the extent that environmental conditions provide concrete opportunities to promote effective use of Facebook, it is likely that this social media tool might relate to valuable academic outcomes. However, future studies are needed to explore how school- or university-based adoption of social media platforms in various functions contributes to the academic-related benefits associated with using Facebook in undergraduate students not only in the Philippines but also in other non-Western societies.

Limitations and future directions

The study has a number of shortcomings. Much like other previously published studies on the link between Facebook use and academic self-efficacy (Boahene et al., 2019; Hassell & Sukalish, 2017), the present study also relied on self-reported data which may be prone to common methods variance. Future research can address this through employing other approaches to collect data such as peer-report ratings on Facebook intensity and academic behaviors. Future studies can also consider exploring students' Facebook usage logs together with other learning management systems (LMS) such as Moodle to provide more definitive results on students' behaviors with social networking sites and educational systems. Furthermore, the current research utilized a cross-sectional research design, which may not generate causal evidence on how Facebook use can affect academic self-efficacy, and perceived study habits. Hence, it is important for future researchers to use longitudinal designs and experimental designs to provide stronger evidence about the impact of

Facebook intensity dimensions on students' academic functioning. In addition, differences among groups were not tested such as programs and gender differences. Therefore, future studies can also examine if there will be demographic differences on the impact of Facebook use on academic outcomes.

Research and practical implications

The research has implications for theory and practice. In terms of theory, the present study contributes to the existing literature about the benefits and caveats of Facebook intensity through demonstrating that self-expression and boredom positively predicted academic self-efficacy and self-reported study habits. This was the first research to demonstrate the association of Facebook use intensity with such learning-related outcomes. However, more research is needed to discover concrete cognitive, motivational, and affective mechanisms through which Facebook use affects academic self-efficacy and study habits. Further, this study expands extant literature regarding the academic-related impacts of using Facebook in samples that are under-represented in social media literature like Philippine setting. Results have implications for understanding the role that social media use plays in non-Western contexts.

In terms of practice, the findings of this investigation highlight the importance of incorporating social networking sites to improve students' academic functioning. University teaching staff are encouraged to use Facebook as a platform for promoting students' inclinations to freely share their personal views on issues that are relevant to the courses they are teaching. Teachers are also recommended to consider utilizing Facebook as a pedagogical tool for students who are prone to experience boredom or disengagement in various academic activities. Indeed, Facebook has a few promising affordances in educational contexts. However, results also point to the significance of educating university students about the 'downside' of excessively using Facebook especially for non-academic reasons. Clearly, administrators, teaching staff, and curriculum specialists are encouraged to design, plan, and implement pedagogical interventions that can maximize the advantages of using social networking sites in higher education settings.

Abbreviation

CFI: Comparative fit index; LMS: Learning management system; RMSEA: Root mean square error of approximation; SRMR: Standardized root mean square residual; TLI: Tucker-Lewis index.

Authors' contributions

Dr. Jana Patricia M. Valdez contributed mainly on the preparation and writing of the manuscript (introduction, theoretical background, methods, and discussion). Dr. Jesus Alfonso D. Datu was in charge of the data analysis section and analyzed the data by performing descriptive statistics, CFA, Pearson *r*-correlation, and path analysis using AMOS v25. He also contributed in the completion of discussion section.

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Availability of data and materials

Data are available from the authors upon request.

Declarations

Competing interests

The authors declare that they have no competing interests.

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