

EXPLORING THE DIMENSIONS OF SOCIAL MEDIA ADDICTION ON STUDENTS' ACADEMIC PERFORMANCE—AN INTEGRATED UGT-SLT APPROACH WITH GENDER-BASED MULTI-GROUP ANALYSIS

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Abstract: This study investigated the effect of social media addiction on the academic performance of arts and science college students in Kerala. The dimensions of social media addiction were conceptualized by integrating the theoretical models of user gratification theory (UGT) and social learning theory (SLT). The mediating effect of student engagement and academic stress was also examined. Furthermore, the moderating effect of gender has been analysed. For this, 620 responses were collected from arts and science college students through a structured survey instrument using a multi-stage stratified sampling technique. The PLS-MGA technique was used for data analysis. Results indicated that addictive use of social media negatively influences academic performance. The study also confirmed a significant mediating effect of academic stress and student engagement on the relationship between social media addiction and academic performance of higher education students in Kerala. The gender-based multi-group moderating effect did not show significant differences between groups. The outcomes offer significant implications for the higher education institutions, teachers, parents, and the public to consider the inappropriate use of social media, academic stress, and student engagement in social media-based learning.

Keywords: Excessive use of social media, social media addiction, student engagement, academic stress, academic performance.

1. Introduction

Social media constitutes an inevitable component in the day-to-day affairs of individuals' lives and is recognised as a new paradigm of communication (Yang et al., 2016). It has revolutionised communication media by offering convenient and universal access to people's interactions (Wang, 2020) by bridging the gap between offline and online life. This exponential growth of social media has eventually turned into repetitive and compulsive usage of social networking sites known as social media addiction or overload (Cao et al., 2018). The excessive use of social media can disrupt people's normal life which causes severe social and health problems (Turel et al., 2018). This is particularly conspicuous among the students, who are increasingly using social networking sites in academics (Alhabash & Ma, 2017).

Researchers have provided empirical evidence on the excessive use of social media in education, which triggers cognitive dissonance and thereby influences the academic performance of students (Cao et al., 2018; Masood et al., 2020). Studies have undertaken various theoretical models to understand the excessive use of social media in education (Kircaburun et al., 2020; Wang, 2020; Turel et al., 2018). Uses and gratification theory (UGT) and social learning theory (SLT) are the most often adopted theories for understanding students' behaviours towards the problematic use of social media (Alhabash & Ma, 2017; Gong et al., 2020; Kircaburun et al., 2020; Wang, 2020). Uses and gratification theory (UGT) presumes that individuals seek different gratifications while using social media and gratifications so obtained are the good predictors of excessive usage of social media (Kircaburun et al., 2020). Moreover, habitual usage of social networking sites is a behavioural, psychological, and social concern in academics and therefore, social learning theory is relevant (Chen & Sharma, 2015; Wang, 2020).

The present study intends to investigate the effect of social media addiction on higher education students' academic performance with the mediating effect of student engagement and academic stress. For this, social

media addiction was conceptualised by integrating the theoretical framework of UGT and SLT. The extant literature did not explicitly identify both user gratifications and social learning model to predict social media usage and addiction (Alhabash & Ma, 2017; Gong et al., 2020; Kircaburun et al., 2020; Wang, 2020). Furthermore, these constructs together have yet to be discussed in the higher education context to predict social media addiction and its effect on students' performance. The novelty of the study lies in incorporating mediating variables student engagement and academic stress along with the dimensions of social media addiction from UGT-SLT perspectives.

This research also sought to answer the following questions:

1. How does user gratification theory and social learning theory explain social media addiction?
2. Does social media addiction influence higher education students' academic performance?
3. Do any gender wise differences occur on the effect of social media addiction on academic performance?

2. Theoretical Background

Dimensions of social media addiction

Social media addiction refers to the extensive usage and adoption of social media with a massive amount of information, which requires processing beyond one's capabilities (Whelan et al., 2020). Alhabash and Ma (2017) examined various user motivations like information sharing, self-documentation, social interaction, entertainment, passing time, self-expression, medium appeal and convenience in varied social media platforms. Balakrishnan and Griffith (2017) outline the potential for user gratification in addictive social media use by examining the influence of content, social, technology, and process gratifications on user inclination toward YouTube viewing. Further, research applying the UGT framework found that user gratifications also vary based on the platform used (Alhabash & Ma, 2017; Kircaburun et al., 2020). Furthermore, studies posited that social media addiction is a learned behaviour and it can be achieved through constant interaction in virtual community platforms, which in turn leads to excessive usage (Chen & Sharma, 2015; Wang, 2020).

Based on social learning perspective, users' learning behaviour was heavily influenced by the opinions and advice of social reference groups (Gong et al., 2020). Yang et al., (2016) argued that the determinants of social media addiction consist of social interaction, social support and social identification. Among the determinants of technology addiction, studies suggested that social influence has been noted to be the strongest predictor of excessive use of technology (Chen, 2020; Chopdar & Prodanova, 2022). Several studies have identified various factors as components of social media addiction in a social learning context. Based on the above, this study proposes **information seeking** (Li et al., 2018; Sahin, 2018), **convenience** (Alhabash & Ma, 2017; Liu et al., 2010), **social influence** (Gong et al., 2020; Venkatesh et al., 2003; Wang, 2020) and **social support** (Bilgin & Tas, 2018; Wang, 2020; Meshi & Ellithorpe, 2021) are the determinants of social media addiction.

Social media addiction and academic performance

Smart technology features associated with social media like audio-video content, google drive, emails, camera and GPS can share resources with student's peer groups so as to improve their academic skills. Educational institutions widely employ social media platforms for collaboration and knowledge acquisition so as to reap academic benefits (Tayo et al., 2019). Whelan et al. (2020) conceptualised the dimensions of social media overload as communication and information overload, where psychological and behavioural conditions while using social media can negatively influence on academic performance. Most of the studies indicated a negative relation between social media addiction and academic performance (Cao et al., 2018; Fu et al., 2020; Yu et al., 2023; Zhang et al., 2024). In contrast, Abbasi et al. (2021) argued that there existed a positive association between academic related students use of smartphone usage and addiction. Although, studies evidenced a strong linkage between social media addiction and academic performance (Busalim et al., 2019; Hosen et al., 2021; Lau, 2017; Whelan et al., 2020). Based on the above arguments, it is proposed the following hypothesis:

H1: Social media addiction negatively influences students' academic performance

Social media addiction and academic stress

Excessive use of social media leads academic stress, resulting from failure to adapt to the academic activities (Malak et al., 2021). Academic stress is considered as students' incapacity to adjust to his/her academic environment (Basri et al., 2022). Students with excessive use of technology may experience higher levels of perceived stress. The tendency to increase the risk of technology addiction might influence an increased level of perceived stress, which moves a student into a negative academic performance. However, Ngien and Jiang (2021) did not support this argument and concluded that social media failed to increase stress among students. Samaha and Hawi (2016) argued that new technology addiction is positively related to perceived stress and negatively to academic performance. Based on the above arguments, this study proposes the following hypothesis:

H2: Social media addiction positively influences academic stress

Social media addiction and students' engagement

Student engagement refers to the physical and mental involvement and commitment of students in their academics or motivational process to engage in learning (Ansari & Khan, 2020; Sokmen, 2021). The dimensions of student engagement comprise cognitive, emotional and behavioural strategies like elaboration of study material, students feeling about the institutional environment, active participation in extra-curricular activities along learning (Fredricks et al., 2004; Tafesse, 2020). Doleck et al. (2018) demonstrated that extensive use of social media can influence the active engagement of students in the learning process. Social media is now an inevitable learning tool in higher education and hence, it promotes consistent learning through a favourable institutional environment (Cao et al., 2018; Fredricks et al., 2016). Based on the above arguments, this study proposes the following hypothesis:

H3: Social media addiction positively influences students' engagement

Students' engagement and academic performance

Tafesse (2020) argued that multi-tasking and time displacement through student engagement in social media might diminish students' cognitive ability and academic attention, but high-quality engagement leads to positive academic performance. Studies (Ansari & Khan, 2020; Su et al., 2021; Virga et al., 2022) evidenced that student engagement through social media had a significant effect on students' academic performance in higher education. Based on the above, this study proposes the following hypothesis:

H4: Students engagement positively influences academic performance

Academic stress and academic performance

When students are provided with an influx of information, they might experience stress, which in turn leads to negative academic performance (Shi et al., 2020). Extant research has suggested that problematic usage of social media results in emotional stress, which leads to negative academic performances (Dhir et al., 2018; Shi et al., 2020; Samaha & Hawi, 2016). In contrast, Ndubuaku et al. (2020) identified that addictive usage of social networking platforms can promote academic performance, preferably among undergraduate students. Social media offers an extensive amount of information (like chats, audio-video content, real-time information) to students and thus, it forces them to follow habitual checking behaviour. Higher education students often face intense academic stress that projects their career prospects. Based on the above, it is proposed the following hypothesis:

H5: Academic stress negatively influences students' academic performance

Mediation effect

Shi et al. (2020) examined the mediating link of stress on the relationship between problematic use of social media and academic performance in educational environment.

Malak et al. (2021) found that excessive use of social media had an indirect effect of stress to predict students' academic performance. This is supported by Cao et al. (2018) who asserted that unregulated usage of social media may create a feeling of stress among students which will negatively influence their academic achievement. Studies (Cao et al., 2018; Homaid, 2022; Malak et al., 2021; Shi et al., 2020) provided empirical evidence on the mediating effect of academic stress on the relationship between social media addiction and academic performance. Based on these arguments, this study proposes the following hypothesis:

H6: Academic stress mediates the relation between social media addiction and academic performance

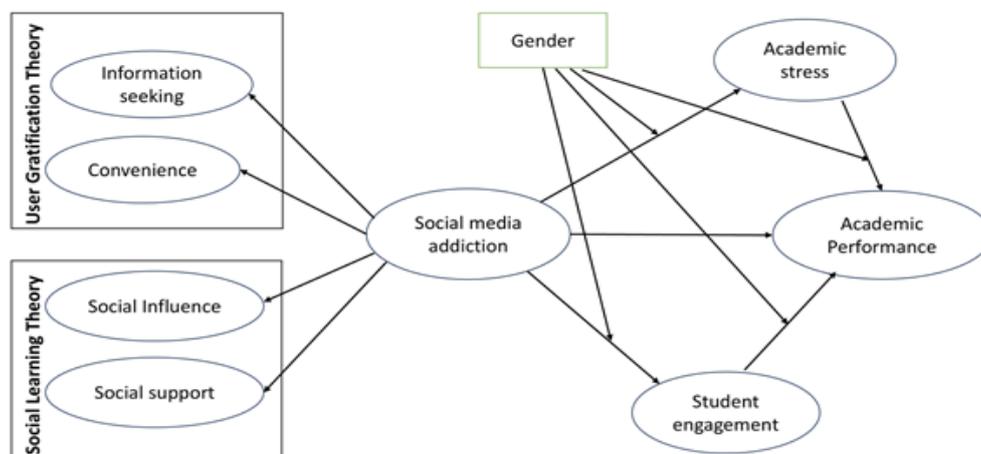
Ansari and Khan (2020) argued that student's involvement in the form of peer interaction, online knowledge sharing behaviour and interaction with teachers had a significant impact on academic performance in social media. The existing literature (Ansari & Khan, 2020; Su et al., 2021; Virga et al., 2022; Tafesse, 2020) suggested that student engagement had a significant mediating effect on the relationship between social media addiction and students' academic performance in higher education. Based on the above, it is proposed the following hypothesis:

H7: Student engagement mediates the relation between social media addiction and academic performance

Gender differences

The importance of social media addiction on students' academic performance has been well established, but there is limited research on how gender may moderate this relationship. In a study, Ajjan et al. (2019) found that there existed a gender-wise difference in the effect of excessive use of social media on the academic performance of college students. Moreover, excessive smartphone technology usage tends to lead to more adverse academic performance among male students (Nayak, 2018). Thus, it is anticipated that varying addictive patterns over social media usage based on gender can have an impact on their academic performance. Therefore, this study theorises that user gratification and social learning dimensions of social media addiction on students' academic performance is stronger for males than females. Also, gender may moderate the relationship between social media addiction, students' engagement, academic stress and academic performance. Moreover, further research is needed to better understand this relationship. Therefore, it is proposed the following hypotheses:

- H8: Gender moderates the relationship between social media addiction and academic stress***
- H9: Gender moderates the relationship between social media addiction and student engagement***
- H10: Gender moderates the relationship between social media addiction and academic performance***
- H11: Gender moderates the relationship between academic stress and academic performance***
- H12: Gender moderates the relationship between student engagement and academic performance***



Conceptual model proposed for the study

3. Materials and methods

The relationship between social media addiction and higher education students’ academic performance in Kerala. For this, dimensions of social media addiction were conceptualised through the constructs of UGT and SLT. A quantitative research design was employed to assess the impact of social media addiction on arts and science college students’ academic performance across selected higher education institutions in Kerala. A structured instrument was designed to obtain responses related to dimensions of social media addiction, academic stress, student engagement and academic performance.

Social media addiction is conceived as a second-order construct formed by lower-order components - information seeking and convenience from UGT context. Social influence and social support were the lower-order components of social media addiction based on SLT model. Four indicators were adapted from Sahin (2018) to measure information-seeking gratification. The construct convenience was measured by using four indicators adapted from Liu et al. (2010). Social influence refers to how people perceive their reference groups like family members, friends and colleagues in performing behaviours. Social influence was measured by using four items adapted from Venkatesh et al (2003). Social support means emotional and affectionate support from the social media community. The items measuring social support were modified by Leung and Lee (2005) and Wang (2020). Student engagement was measured by using five indicators adapted from Fredricks et al. (2016). Four modified indicators were adapted from Alvarez-Risco et al. (2021) to measure academic stress. Four items were adapted from Alamri et al. (2020) to measure academic performance. All constructs were measured with five-point Likert scales (from strongly disagree to strongly agree).

Sampling and Data collection

A well-structured questionnaire was designed for data collection. The inclusion criteria for respondents were regular students enrolled in graduate and postgraduate programs, along with daily social media users. A sample of 620 higher education students was collected by using a multi-stage stratified sampling technique. The respondents for the study were selected among the students of arts and sciences colleges in Kerala. Initially, the entire state was geographically divided into three zones - north, central and south Kerala. In each zone, two government and aided colleges along with five self-financing colleges were taken and therefore, a total of 27 colleges formed the sample for the study (as per Kerala higher education survey report 2022, the strength of self-financing colleges was high). Twenty-five students from each of the selected colleges (irrespective of their streams of study) formed the respondents for the study and hence, a total of 675 responses were obtained.

After discarding uncompleted and missing items, a final total of 620 samples with a response rate of 86 per cent were taken for analysis. The data were collected using an online questionnaire targeting higher education students. Initially, a pilot study was conducted using a sample of 30 students to ensure the validity and reliability of the instrument. To ensure the sampling adequacy, G*Power 3.1.9.7 software was used and the results revealed that the minimum sample size was 107 with a statistical power level of 0.80, five predictors, and an alpha level of 0.05. The multi-collinearity assessment of the inner model was estimated using VIF values, which indicated the absence of common method bias based on the procedures of Kock (2015). The causal relation between the constructs was examined by using Smart PLS SEM version 4 software (Ringle et al., 2014; Hair et al., 2020).

4.Data analysis and Results

Out of 620 respondents, 363 were female. Most of the students (n=341, 55 percent) were from self-financing category. Instagram was the most preferred (n=296, 47.74 percent) social media platform. In addition, most of them (n=249, 40.16 percent) opined that an average 1-2 hours daily they were engaged in social media.

Table 1: Demographic Profile of respondents(N=620)

	Frequency	Percentage
Gender		
Male	257	41.45

Female	363	58.55
Category		
Government	144	23.22
Aided	135	21.77
Self-financing	341	55.00
Most preferred social media platform		
WhatsApp	146	23.55
Instagram	296	47.74
YouTube	132	21.29
Others	46	07.42
Average time spend in social media daily		
Less than one hour	64	10.32
1-2 hrs	249	40.16
2-3 hrs	194	31.29
Above 3hrs	113	18.23

Source: Author's own works

Measurement Model Evaluation

The evaluation of the measurement model was performed through confirmatory factor analysis, followed by the reliability and validity of all constructs and their measures. To establish construct reliability, Cronbach's alpha (Cronbach, 1951) and composite reliability (Janadari, Subramaniam, & Wei, 2016) were assessed. Convergent validity of the measurement model was performed through item loadings, and Average Variance Extracted (AVE) (Hair et al., 2014). Results (as shown in Table 1) indicated that computed Cronbach's alpha values of all the constructs were above the minimum recommended value of 0.70 as suggested by Nunnally and Bernstein (1994).

The composite reliability scores of all the constructs were above 0.60 as suggested by Henseler et al. (2014). Therefore, results demonstrated the acceptable reliability. The results also indicated that item loadings of all constructs were above 0.708, and AVE values were above the suggested minimum value of 0.5 (Hair et al., 2017). Hence convergent validity was established. The discriminant validity was examined through the Fornell-Larcker Criterion (Fornell & Larcker, 1981) and the HTMT ratio (Henseler et al., 2015). The results demonstrated that HTMT values were less than 0.85 (as shown in Table), thus fulfilling the discriminant validity of all given constructs (Kline, 2016).

Table 2: Measurement Model

Components	Items	Loadings	Composite Reliability	AVE	Cronbach's alpha
Convenience	CON1	0.812	0.916	0.686	0.886
	CON2	0.844			
	CON3	0.826			
	CON4	0.821			
	CON5	0.838			
Information seeking	IFS1	0.841	0.918	0.732	0.878
	IFS2	0.843			
	IFS3	0.885			
	IFS4	0.853			
Social influence	SI1	0.907	0.797	0.561	0.655
	SI2	0.915			
	SI3	0.763			
Social support	SS1	0.780	0.815	0.526	0.701

Student engagement	SS2	0.654			
	SS3	0.691			
	SS4	0.768			
	INF2	0.934			
	INF3	0.893			
	STE1	0.702	0.902	0.649	0.864
STE2	0.796				
STE3	0.845				
STE4	0.839				
STE5	0.838				
Academic stress	AS1	0.829	0.907	0.698	0.855
	AS2	0.867			
	AS3	0.824			
	AS4	0.821			
Academic performance	AP1	0.878	0.904	0.703	0.859
	AP2	0.778			
	AP3	0.859			
	AP4	0.835			
Social media addiction	CON	0.660	0.842	0.572	0.747
	IFS	0.818			
	SI	0.752			
	SS	0.786			

Source: PLS SEM Results

Table: 3. Measurement Model: Fornell-Larcker Criterion

Components	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Convenience (1)	0.828						
Information seeking (2)	0.353	0.856					
Social influence (3)	0.271	0.535	0.865				
Social support (4)	0.327	0.592	0.471	0.725			
Student engagement (5)	0.265	0.573	0.597	0.536	0.806		
Academic stress (6)	0.454	0.339	0.258	0.328	0.266	0.835	
Academic performance (7)	0.254	0.506	0.583	0.544	0.630	0.251	0.838

Source: PLS SEM Results

Table: 4. Measurement Model: HTMT ratio

	CON	IFS	SI	SS	SE	AS	AP
CON	--						
IFS	0.397	--					
SI	0.328	0.638	--				
SS	0.418	0.726	0.591	--			
SE	0.307	0.654	0.687	0.659	--		
AS	0.829	0.388	0.316	0.429	0.314	--	
AP	0.289	0.572	0.675	0.677	0.725	0.290	--

Source: PLS SEM Results

Structural Model Assessment

Structural model assessment establishes the predictive relevance of the research model (Hair et al., 2017; Janadari, Subramaniam, & Wei, 2016). It follows the estimation of path coefficients, coefficient of determination (R^2) and predictive relevance (Q^2 predict, RMSE and MAE). To assess the structural model, this study employed non-parametric bootstrapping (Hair et al., 2017) with 10000 replications. Moreover, the significance of the hypothesized path coefficients in the structural model was evaluated by using a two-tailed t-test at 5% level (Hair, Ringle and Sarstedt, 2011). Initially, collinearity issues were checked by using VIF inner values, which were found to be less than 3.33 as suggested by Hair et al. (2019). The relation between social media addiction to academic performance ($\beta=0.508$, $t=9.450$, $p< 0.000$, H1 supported); social media addiction to academic stress ($\beta=0.648$, $t=17.765$, $p< 0.000$, H2 supported); social media addiction to student engagement ($\beta=0.650$, $t=22.141$, $p< 0.000$, H3 supported); student engagement to academic performance ($\beta=0.346$, $t=7.279$, $p< 0.000$, H4 supported) were found to be statistically significant. In addition, results indicated that academic stress had a significant negative effect on academic performance ($\beta=-0.170$, $t=4.690$, $p< 0.000$, H5 supported).

Moreover, the R^2 value of student engagement was 0.422, which indicated that 42.2 percent of variance in student engagement was explained by social media addiction. Also, the R^2 value of academic stress was 0.420, meaning that 42 percent of variance in academic stress was explained by social media addiction. Results also confirmed that 49.1 percent of variance in academic performance was explained by social media addiction, student engagement and academic stress together. Thus, model indicated moderate predictive power as suggested by Henseler et al. (2009).

Table: 5 Path coefficient estimates

PATHS	Original sample	Sample mean	Standard deviation	T statistics	Inner VIF	P values
AS -> AP	-0.170	-0.168	0.036	4.690	1.851	0.000
SMA -> AP	0.508	0.507	0.054	9.450	2.971	0.000
SMA -> AS	0.648	0.647	0.036	17.765	1.000	0.000
SMA -> STE	0.650	0.651	0.029	22.141	1.000	0.000
STE -> AP	0.346	0.347	0.048	7.279	1.858	0.000

Source: PLS SEM Results

Table: 6. Co-efficient of Determination

Paths	R^2	Adjusted R^2
Academic performance	0.491	0.489
Academic stress	0.420	0.419
Student engagement	0.422	0.421

Source: PLS SEM Results

PLS predict procedure was applied for estimating the predictive relevance of the model. Q^2 Predict Value of constructs student engagement (0.419), academic stress (0.418), and user intention (0.384) were found to be positive (Hair et al., 2017). Furthermore, the computed values of MAE (Mean Absolute Error) for all constructs were less than RMSE (Root Mean Squared residual Error) values of path model. Therefore, the model is predictively valid (as shown in Table 7).

Table: 7. Predictive relevance of the Model

Constructs	Q^2 Predict	RMSE	MAE
Academic performance	0.384	0.787	0.639
Academic stress	0.418	0.765	0.571
Student engagement	0.419	0.765	0.574

Source: PLS SEM Results

Mediation effect

Mediation analysis was performed to assess the mediating role of student engagement and academic stress on the relationship between social media addiction and academic performance. The results (as per Table 8) confirmed a significant indirect effect of social media addiction on academic performance through student engagement ($\beta=0.225, t=6.766, p<0.001$) and social media addiction on academic performance through academic stress ($\beta=-0.110, t=4.461, p<0.001$). The direct effect of social media addiction on academic performance ($\beta=0.727, t=23.064, p<0.001$) was significant. Since both direct effect and total indirect effect were significant, it was concluded that there existed complementary partial mediation. Thus, H6 and H7 were supported.

Table 8. Specific Indirect effect

Paths	Path Coefficients	T-static	p value
Social media addiction-> Academic stress -> Academic performance	-0.110	4.461	0.000
Social media addiction-> Student engagement -> Academic performance	0.225	6.766	0.000

Source: PLS SEM Results

Multi-Group Moderating effect

To test for gender moderating effects of social media addiction, student engagement and academic stress on academic performance, this study performed permutation test and PLS-MGA as suggested by Hair et al. (2018). The results (as shown in Table 9) indicated that sample had complete invariance for all constructs and hence, allowed to compare a research model over two groups (Rasoolimanesh et al., 2021). However, results confirmed a non-significant difference on all path coefficients and therefore, H8, H9, H10, H11 and H12 were not supported

Table 9: Results of Invariance measurement using MICOM analysis

Const ructs	Confi gural invari ance	Compositi onal invariance		Part ial mea sure me nt in vari ance es ta blis hed	Equal mean assessment		Eq ual	Equal variance assessment		Full Me asu rem ent in vari ance es ta blis hed	
		C= 1	Confide nce interval		Diffe rence	Confiden ce interval		Diff erences	Confiden ce interval		E qu al
SMA	Yes	0.99 9	(0.998/1 .000)	Yes	0.018	(-0.164 /0.165)	Yes	- 0.00 4	(-0.251 /0.256)	Ye s	Yes
STE	Yes	1.00 0	(0.999/1 .000)	Yes	0.005	(-0.162 /0.160)	Yes	0.02 8	(-0.224 /0.199)	Ye s	Yes
AS	Yes	1.00 0	(0.999/1 .000)	Yes	0.038	(-0.164 /0.150)	Yes	0.01 5	(-0.222 /0.216)	Ye s	Yes

AP	Yes	1.00	(0.999/1.000)	Yes	0.027	(-0.160/0.165)	Yes	0.021	(-0.216/0.13)	Yes	Yes
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Table 10: Results of multi-group analysis

Path coefficients				Confidence interval	P value	Results
Relationship	Men	Women	Difference			
SMA -> AP	0.574	0.462	0.112	(-0.218 /0.211)	0.323	Not supported
SMA -> AS	0.651	0.647	0.004	(-0.155 /0.140)	0.980	Not supported
SMA -> STE	0.660	0.643	0.017	(-0.112 /0.119)	0.761	Not supported
STE -> AP	0.293	0.383	-0.089	(-0.191 /0.193)	0.359	Not supported
AS -> AP	-0.187	-0.156	-0.030	(-0.151 /0.140)	0.666	Not supported

5. Discussion

This study investigated the relationship between social media addiction and academic performance with the mediating effect of academic stress and student engagement among higher education students in Kerala. Moreover, this study also examined the moderating role of gender on the relationships between social media addiction, student engagement, academic stress and academic performance of arts and science college students. This study attempted to explain how the dimensions of excessive social media usage influence the academic performance of higher education students. For this, social media addiction was measured by integrating the theoretical framework of UGT and SLT. A research model was proposed, by assuming positive relationships between constructs and also examined by conducting a survey among arts and science college students in Kerala.

The results of the study confirmed that excessive social media usage weakens academic performance among college students. This implies that students tend to be negatively susceptible to social media-based academics because of their personal gratifications and social learning forces along with academic flexibility, free time and lack of self-control. These results are in line with the findings of previous studies (Foroughi et al., 2022; Junco, 2015; Lau, 2017; Ponnusamy et al., 2020) which found that increased usage of social media tends to distract academic performance and efficiency. Although some of the past studies (Ainin et al., 2015; Doleck et al., 2018) found inconsistent results on the relationship between social media addiction and academic performance.

Results of the study also found that social media addiction is significantly and positively associated with students' engagement in academics. The pattern of relationship is consistent with the results of previous studies (Rashid & Asghar, 2016) stating that social media-based learning features like peer interactions, availability of online learning content, and flexibility in academics can promote student engagement. In contrast, Tafesse (2020) found a negative association between social networking site use and student engagement. It is also found that student engagement is positively associated with college students' academic performance, which is in line with the findings of previous studies (Ansari & Khan, 2020; Tafesse, 2020) where more engaged students in social media-based collaborative learning along with peer interaction and online sharing behaviour can improve their academic performance. In contrast, studies (Karpinski et al., 2013; Lau, 2017) evidenced that academic engagement with multi-tasking exhibits poor academic performance.

The results revealed a significant positive association between social media addiction and academic stress, indicating that higher education students with increased usage of social media experienced higher levels of academic stress (Samaha & Hawi, 2016). This study further provided that there exhibited a negative relation between academic stress to academic performance, which demonstrated that students with academic stress are likely to respond negatively to their learning requirements. Empirical evidence confirmed a negative correlation between academic stress and academic performance (Trigueros et al., 2020; Zhao, 2023). This implies that when students are exposed to high levels of academic stress consequent to social media overload, leads lack of attention and, a depressive mood, thus negatively influence on academic performance. The results also confirmed a significant mediating effect of student engagement on the relationship between social media addiction and college students' academic performance. This mediation effect suggests that reduced academic performance due to the increased usage of social media is mainly explained by students' engagement. These findings are consistent with (Lam et al., 2012; Tafesse, 2020) where students are confronted with multi-tasking, they can fix priorities to academics to ensure academic engagement and performance. However, Zhang et al. (2018) found that increased use of social media weakens students' learning engagement which negatively influences their academic performance.

The study also found a significant mediating effect of academic stress on the relationship between social media addiction and academic performance. This means that students with excessive use of social media are prone to mental boredom, and irritation which inhibits students' academic attention, interest in learning and overall performance. These results are in consistent with the prior studies of (Gabre & Kumar, 2012; Zhao, 2023), indicating that multitasking with social media or addictive tendencies can interfere with student's learning ability, preferably, academic concentration and comprehension. Further, if the students fail to manage social media productively, they will be seriously harmed at an academic level. The research model was also evaluated by testing the gender moderation effect using PLS Mult-group analysis on the relationship between social media addiction, student engagement, academic stress and academic performance. The outcomes of the model did not find any gender-based differences.

6. Implications

Theoretical implications

The main objective of the study was to assess the social media addiction and its effect on arts and science colleges students' academic performance in Kerala. The outcomes of the present study have some theoretical and practical implications. Since previous studies made an inconclusive outcomes of social media addiction as either positively (Hosen et al., 2021; Lau, 2017; Sobaih et al., 2022) or negatively (Foroughi et al., 2022; Junco, 2015; Lau, 2017; Ponnusamy et al., 2020) influences academic performance. This study is the first to examine the direct effects of both UGT and SLT dimensions of social media addiction on academic performance. The outcomes of the present study are in consistent with findings of previous studies (Falgoust et al., 2022; Hosen et al., 2021; Wang, 2020), where it examines the effect of problematic use of social media on students' academic performance through gratification motives as well as social learning forces. Further, this work proposes an extensive model, which examines the mediating role of student engagement and academic stress on students' academic performance, that contributes to the existing body of research.

The results of the study found that UGT and SLT dimensions of social media addiction exhibited a positive impact on student engagement and academic performance. Furthermore, excessive use of social media positively influenced on academic stress but it weakens academic performance. Results also established that both student engagement and academic stress significantly mediated on the relationship between social media addiction and academic performance. The present study also made an attempt to explore the gender moderation effect on the relationship between excessive use of social media and academic performance, with the mediating effect of student engagement and academic stress together, thus it adds well to the existing body of research. This model extends the existing literature on social media addiction, as the indirect role of student engagement and academic stress certainly instrumental on the academic performance of students in higher education.

Practical Implications

This research provides a framework for higher education institutions, policy makers, parents, educators and the public looking to improve students' academic performance and force them to restrict the improper usage of social media. Initially efforts should be made to raise students' awareness on the dark side of social media and its addictive usage. At the same time, support the positive use of social media as motivation, which will improve their academic achievement. Educators should promote the value of judicious use of social media in academic context. Faculty members willing to enhance academic performance may be successful if they boost student engagement, encourage and inspire students by incorporating social media tools in learning. The service provider should also incorporate additional features to inform the user about the length of time they have spent on the platform, so that they can reduce the negative effect of excessive social media usage and enable them to frame strategies for good social media management in academics.

Limitations of the study and scope for future research

This study merely focused on the addictive usage of social media and its effect on academic performance of arts and science college students, indicating its limited generalisability. Future investigations with an increased sample size in a wider geographical area would be beneficial. Despite the negative consequences on academic performance, social media usage continues to be on the rise and hence, future research must address this issue in detail. Moreover, future studies can incorporate the outcomes of problematic use of social media among varied groups of academic community, say, adolescents, teenagers and youth at large. A longitudinal research design can also employ for future research to test the causality between social media addiction and academic performance. In addition, studies can be conducted to assess the effect of social media addiction on other disciplines too.

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