The relationship between social network, social media use, loneliness and academic performance: A study among university students in Bangladesh

Md. Aminul Islam[1]
University of Liberal Arts, Bangladesh

Bezon Kumar
Rabindra University, Bangladesh

DOI: 10.30547/worldofmedia.4.2019.2

Abstract

Multiple information and communication technologies are ubiquitous in human lives today. Our pattern of social interactions, formation and maintaining of relationships and status of mental health are mostly shaped by the communication technologies and social media platforms. Yet several studies show that we feel increasingly alone and the sense and feeling of loneliness are becoming an epidemic in modern society. On the other hand, several studies indicate that the use of communication technologies and social media platforms affect academic achievements of students both positively and negatively. The dimensions of an individual's loneliness and interactions on social media platforms are well documented from the perspective of western countries, yet little is known about it from the context of developing countries like Bangladesh. The purpose of this study was to examine the structure of real-life and virtual social network and their relationship with loneliness and academic achievements of university students in the country. In this regard, the study used primary data collected from 234 university students. The study employed Lubben Social Network Scale (LSNS-6) and UCLA loneliness scale to measure the level of real-life social network and loneliness. The study finds that students are averagely engaged in real-life social network and moderately lonely. The study also finds a significant and positive relationship between Facebook use and loneliness, and a significant and positive relationship between social media (Facebook) use and loneliness.

Corresponding author:
Md. Aminul Islam, Department of Media Studies and Journalism,
University of Liberal Arts, House 56, Rd 4/A Satmasjid Road,
Dhanmondi, Dhaka-1209, Bangladesh.
Email: aminul.islam@ulab.edu.bd /aminul.vu@gmail.com

In addition, the study finds that academic performance or GPA of a student may be decreased by 0.843 and 0.781 if the student uses social media one hour more and suffer from loneliness, respectively.

Keywords
Facebook use, social network, loneliness, academic performance.

Introduction
New communication technologies and social media platforms have made possible to get more connected to each other today than ever in the history of human being. Internet, mobile phone and social media platforms are the driving force of the connections. According to estimation by the International Telecommunication Union (ITU), about 51.2 per cent of the global populations (3.9 billion) were using the Internet by the end of 2018 (ITU, 2019). Other statistic data show that more than 4.33 billion people were using Internet actively by July 2019, which means that about 56 percent of the global population were active users of Internet (Statista, 2019). According to The Global State of Digital in 2019 Report, worldwide the number of social media users was 3.484 billion and mobile phone users was 5.112 billion in 2019. On an average, people had 7.6 social media accounts around the world and daily time spent on social was 142 minutes a day (Smith, 2019). Bangladesh is a South Asian country with population about 16.8 million. The access to and use of communication technologies are increasing very fast in the country. The total number of Internet users in the country reached 96.199 million and total number of mobile phone subscribers reached 161.772 million at the end of June 2019 in Bangladesh (BTRC, 2019). The table below shows picture of total population, Internet and Facebook users in Bangladesh in comparison to South Asia and Global perspective.

Table 1

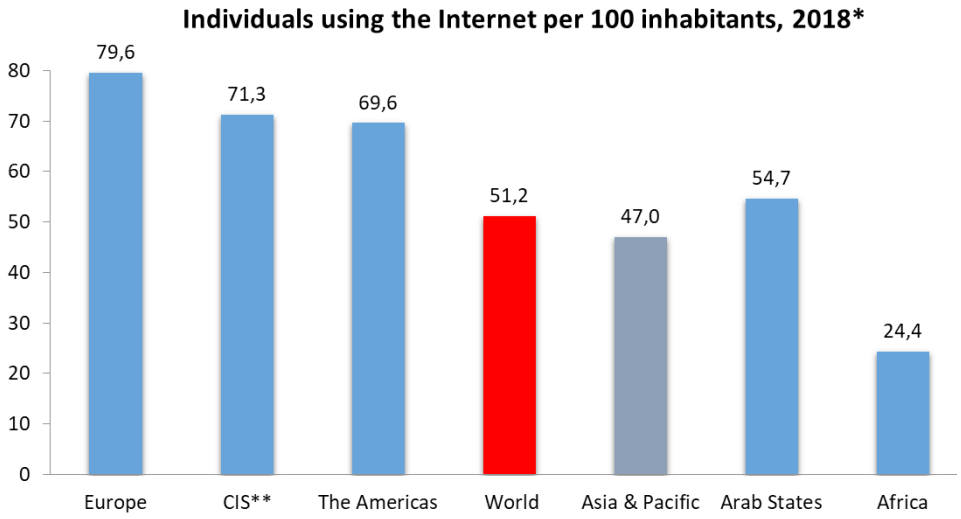
Internet users and 2019 population statistics for Asia

Asia Region	Population (2019 Est.)	Population (% world)	Internet users 30-June-2019	Penetration (% population)	Internet (% users)	Facebook 31-Dec-2018
Asia only	4,241,972,790	55.0 %	2,200,658,148	51.9 %	49.8 %	867,984,000
Rest of world	3,474,250,419	45.0 %	2,221,836,474	64.0 %	50.2 %	1,331,444,570
All the world	7,716,223,209	100.0 %	4,422,494,622	57.3 %	100.0 %	2,199,428,57
Bangladesh	168,065,920		94,445,000	56.2 %		28,000,000

Source: https://www.internetworldstats.com/stats3.htm

Figure 1

Individuals using the Internet per 100 inhabitants around the world



Regions are based on the ITU BDT Regions, see: http://www.itu.int/en/ITU-D/Statistics/Pages/definitions/regions.aspx.html
*Note: * Estimate ** Commonwealth of Independent States*
Source: ITU World Telecommunication /ICT Indicators database

People are spending too much time communicating and interacting with others today. Yet several studies show that we feel increasingly alone and the sense and feeling of loneliness is becoming an epidemic in modern society (Alberti, 2018; Brown & Wood, 1953; Germine, 2018; Kar-Purkayastha, 2010; Killeen, 1998; Wood, 2013). However, a critical look into how technology-mediated communication affects users offer mixed and conflicting results. Some studies show that use of social media such as Facebook is linked to depressive symptoms (Alshammari et al., 2017; Steers et al., 2014), feelings of isolation (Song et al., 2014), self-esteem and sense of belonging (Tobin et al., 2014), sleep disturbance (Levenson et al., 2016; Wolniczak et al., 2013). Another study found that there is relationship between loneliness, depression and Internet addiction; and loneliness and Internet addiction are risk factors for depression (Demir, 2016). Several studies reveal that too much use of social media make an individual feel lonely and depressed. For example, in their experimental study Hunt et al. (2018), found that there is a causal connection between time spent on Facebook, Snapchat and Instagram and increased depression and loneliness. In a study, Lin et al. (2016) found that there is association between amount of time spent on

social media and level of depression. Their results indicate that individuals who spend more time on using social media are more likely to be depressed. Scott et al. (2018) found that there is positive relationship between posting photo and narcissism. However, their results reveal that in the case of loneliness and shyness the relationship is negative. While some other studies indicate that Facebook did not make people lonely, rather lonely people were more likely to use the social media site (Song et al., 2014). Meanwhile, in another study, Marshall et al. (2015) found that narcissists are more frequently update about their achievements, diet, and exercise, and individuals with outgoing characteristics post more frequently update about their social activities. Another study found that Facebook 'Likes' less likely affect self-esteem of people with purpose (Burrow & Rainone, 2017). However, Facebook profiles raise users' self-esteem and affect behavior (Toma, 2013). In an online social networking experiment, Deters & Mehl (2012) found that status updating activities on Facebook decrease loneliness.

Growing body of research indicates that loneliness has multiple causes and effects on human body and mind (Cohen, 2004; Umberson & Montez, 2010). Results of several studies suggest that suffering from loneliness for a long time can lead to changes in the cardiovascular (Valtorta et al., 2016; Xia & Li, 2018), nervous systems (Cacioppo & Decety, 2009; Zelikowsky et al., 2018), health behavior (Winkel et al., 2017), immune and mortality risk (Cole et al., 2015; Holt-Lunstad et al., 2015; Steptoe et al., 2013). In the cases, the determining factors are the structural characteristics and types of social networks (Medvene et al., 2015), quality and quantity of the relationship (Schmidt & Sermat, 1983; Valtorta et al., 2016; Wiseman et al., 2006). For example, Cohen (2004) explored three aspects of social relationship and their association health outcomes. The researcher found that social relationships-social support, social integration, and negative interaction-strongly affect both physical and mental health. Another study revealed the mechanism in which age, socioeconomic status, and other factors contribute to social isolation and poorer mental health (Alberti, 2018). However, Weeks et al. (1980) argued the relationship between loneliness and depression is not causal, meaning that neither causes directly the other, though origins of the both are same. However, there are contrasting views about the impact of social media on face-to-face connections. Some researchers note that more interactions on social media are replacing face-to-face connections. Meanwhile, other researchers argue that social media does not decrease face-to-face interactions (Hall et al., 2018). However, studies suggest that more reliance on social technology instead of face to face interaction create a feeling of social isolation. In a meta-analysis, Huang (2010) investigated forty studies

to find out the relationship between depression, loneliness, self-esteem, and life satisfaction. Its results show that there is a small detrimental effect of Internet use on psychological well-being. Another study finds that social interaction on Facebook may decline subjective well-being in young adults, while it is increased as a result of frequent interactions with supportive 'offline' social networks (Kross et al., 2013). Meanwhile, Primack et al., (2019) found that there is no association between perceived social isolation and having positive experiences on social media. However, an individual's negative experiences on social media may increase their possibility of being isolated from social life.

Meanwhile, university campus is a new social environment for newly admitted students. The campus opens new horizons, they encounter multiple new experiences. The experiences include new culture of social interactions, new friendship, relationships with peers and teachers, new mindset and life philosophy. Many students struggle to cope with the new environment socially and emotionally. Little is known about the transition-related changes in health behavior among university students. Some studies argue that many students experience symptoms of loneliness and depression (Diehl et al., 2018) at their university life. The feeling of loneliness at university is more common than perceived which may impact academic achievements of the students. For example, Zarei et al. (2013) investigated the relationship between loneliness and social acceptance and the academic performance of the students. They found that loneliness is the most powerful variable in the prediction of academic achievement. Findings of another study suggest that there is the association between loneliness and GPA. Those who feel lonelier, achieve lower GPA (Neto & Golz, 2017). Meanwhile, Bahmani et al. (2017) argued that depression and loneliness do not affect academic achievement among university students.

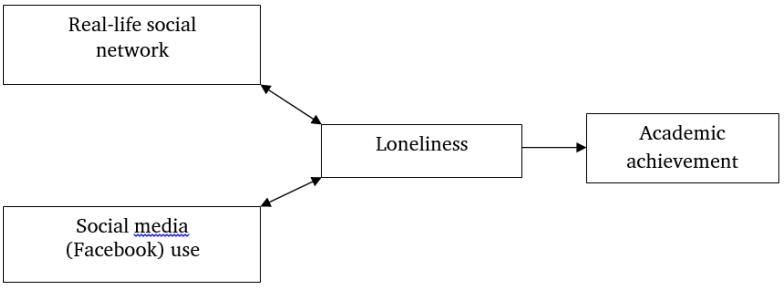
Thus, it is evident that a causal association between social networks, social media use and health is well established by wealth of empirical evidence in various recent cross sectional, longitudinal, experimental and quasi-experimental studies, and most of the studies are from western perspectives. But the mechanisms through which social relationships affect mental health and life achievement remain to be explored. Moreover, little is known about the association between loneliness and social media use and the impact of each of them on academic achievement. To the best knowledge of the researchers, no researcher has explored the relationship between mental health (loneliness) and real-life social network and virtual social network (Facebook), from the context of Bangladesh. To fill up the gap, this study investigates the structure of real-life and virtual social network and their relationship with loneliness and academic

achievement from the context of the country. This article tries to answer three major questions. First, what is the structure of a real-life social network and level of loneliness? Second, what is the relationship between social media use and loneliness? Third, what is the impact of loneliness on academic performance?

To be more specific, the objectives of the study are three folds. First, it investigates the structure of real-life and virtual social network as well as the levels of loneliness of the participants. Second, it explores the relationship between social media use and the level of loneliness. Finally, it examines the impact of loneliness on academic performance of the university students in Bangladesh.

Theoretical framework

The emergence of computer-mediated communication has revived the significance of the theory of use and gratifications (Ruggiero, 2000). For a comprehensive understanding the role of social media in mental health, Jenna et al. (2018) proposed a theoretical approach which can be outlined as the interpersonal-connection-behaviors framework. For them, social media sites can benefit people when they use them for meaningful social connections. On the contrary, the use of the platforms can cause harm through multiple ways such as isolation and social comparison. In another theoretical model (Nowland et al., 2017), the researchers note that the relationship between loneliness and social media platforms use is bidirectional and dynamic. According to the model, social technologies can be a strong tool for reducing loneliness when it is used to enhance existing relationships and forge new social connections. On the contrary, the technologies can increase the 'social pain' of interaction and feelings of loneliness when people use it as a scope for escaping from reality of life and social world. So, it can be argued that the impact of Facebook use is two dimensional – it can deteriorate and improve mental health conditions, social relations and academic achievement. The flow chart below shows the relationship between real-life social network, social media use, loneliness and academic achievement.



Methodology

Study area and sample selection

This article was mainly based on primary data. Rajshahi district of Bangladesh was selected randomly as the study area. It focused on private university students only. There are two private universities in the district. Among these universities, one university was chosen randomly, and the selected university was Varendra University. The university has about 5000 students in 12 distinct departments. These departments were considered as strata. Using stratified sampling method, a semi-structured questionnaire was distributed among 10 percent students in each department randomly. Therefore, a total of 500 questionnaires were sent for the survey in January 2019. The researchers got back only 259 questionnaires in March 2019. After sorting, coding and editing, 234 questionnaires were used for the final data analysis. The rest questionnaires were omitted as those were not filled properly.

Tools

Lubben Social Network Scale

The study measured the social network structure and pattern of social interaction by using Lubben Social Network Scale (LSNS-6) developed by James Lubben (Lubben, 1988; Lubben et al., 2006). The LSNS-6 total score is an equally weighted sum of these six items. The scale consisted of 6 items, and scores for each question ranged from zero to five. The score zero indicated minimal social integration and five indicated substantial social integrations. The total score was an equally weighted sum of the 6 questions. Scores ranged from 0 to 30 with higher scores indicated a greater level of social support and low risk for isolation. A score less than 12 indicated a person with an extremely limited social network and high risk for isolation. We also tried to understand the level of social network of the respondents by dividing total score in three categories. A score of 0-10 indicated extremely limited social network, 11-20 indicated moderate social network and 21-30 indicated strong social network.

UCLA loneliness scale

Besides using LSNS, the study also used UCLA (University of California Los Angeles) loneliness scale to measure the level of loneliness among university students (Cecen, 2008; Jobe & White 2007). Twenty items UCLA loneliness scale consisting with 10 negatively stated (lonely) and 10 positively stated (non-lonely) items are used whose score ranges from 0 to 60 (Rusell et al., 1980).

According to the rules of UCLA loneliness scale, the score zero means student is not lonely while the score 60 means student is highly lonely. More specifically, the score ranges from 0 to 20.00 reveals the lower level of loneliness, the score ranges from 20.01 to 40.00 and 40.01 to 60.00 reveal the moderate level and severe level of loneliness, respectively.

Data analysis

One-way ANOVA analysis

Uses of social media have not only positive effects but also some negative effects like loneliness. In order to examine the impact of uses of social media on loneliness, the study applies a one-way ANOVA test which shows the variation of loneliness with the variation of uses of social media. In this study, loneliness is measured by the UCLA loneliness scale (Cecen, 2008; Jobe & White 2007). To make a variation, students are divided into three groups such as students who use social media (Facebook) 1 hour and below per day, 1.1 to 2 hours per day and 2.1 hours and above per day. The one-way ANOVA test is applied to find out the loneliness impact of uses of social media with respect to three different categories of loneliness such as lower, moderate and severe level of loneliness.

Linear regression analysis

Students' academic performance is not just the academic result, but it has multiple effects not only on the students themselves but also on the whole economy. Because, the academic performances of students affect the socio-economic development of a country. Therefore, it requires identifying the factors affecting academic performance of the university students as university students are the future of a nation. There are many factors that affect academic performance. By following earlier studies, this article considers a cause and effect relationship between academic performance and a set of explanatory variables. Since the dependent variable, academic performance measured by last year academic result or Grade Point Average (GPA), is continuous, the study applies a linear regression model estimated through OLS method. The following equation states the above relationship.

$$AP_i = f(M_i) \qquad (1)$$

Econometrically the equation 1 can be formed as:

$$AP_i = M_i + u_i \quad (2)$$

where, $AP_{i,}$ dependent variable, is academic performance, M_i is a set of explanatory variables that affect the academic performance and u_i is stochastic disturbance term.

Therefore, the specified multiple regression model is:

$$AP_i = \delta_0 + \delta_1 CA + \delta_2 IE + \delta_3 SH + \delta_4 USM + \delta_5 FI + \delta_6 PCA + \delta_7 SN + \delta_8 PES + \delta_9 RR + \delta_{10} LN + \varepsilon_i \quad (3)$$

where, AP_i is academic performance, $\delta_0 \ldots\ldots \delta_{10}$ are parameters to be estimated and ϵ_i is the stochastic disturbance term. The explanatory variables used in above model are explained in Table 2.

Table

Description of explanatory variables used in multiple regression model

Name of variables	Type	Measurement	Expected sign
Class attendance (CA)	Continuous	Number of attendances in class out of total number of classes	+
Internal evaluation (IE)	Continuous	Marks obtained from teacher's internal evaluation	+
Study hour (SH)	Continuous	Total time of studying per day (hours)	+
Uses of social media (USM)	Continuous	Total time (hours) of using social media (Facebook) per day	–
Family income (FI)	Dummy	Family's total income per month (thousand Tk.)	+
Participation in co-curricular activities (PCA)	Dummy	1 if participates in co-curricular activities, 0 otherwise	+
Social network (SN)	Continuous	Estimated values of Lubben Social Network Scale	+
Psychological and economic supports (PES)	Dummy	1 if students get psychological and economic supports, 0 otherwise	+
Romantic relationship (RR)	Dummy	1 if a student has romantic relationship, 0 otherwise	+
Loneliness (LN)	Continuous	Estimated values of UCLA loneliness scale	–

All these variables and their expected sign have been considered in the regression model.

Results and discussion

We are more connected to each other today than ever in the history of human being, we tend to spend too much time communicating and interacting with others. In the real-life, live the web relationships of family, friends and neighbors. The relationships are sources of diverse support. The number of contacts, close of the relationships and frequency of communication function as support system (Gallant, 2013; Goldsmith, 2013). Such relationships are being changed by social media platforms like Facebook. In addition to a source of social support, people use Facebook to satisfy their various needs such as motivations of seeking friends, entertainment, information, and convenience, social capital and life satisfaction (Basilisco & Cha, 2015). Table 3 shows demographic and Facebook use related features of university students in Bangladesh. About 58.1% of the respondents use Facebook for keeping contact with others which means that Facebook is used as an additional option to real-life social interaction. It can be argued that social media platforms such as Facebook can be a tool to increase a possibility of getting social support in real-life. In the virtual environment, any new information or link of the text can be considered as a resource. A majority (67.9%) of the respondents report that they do share the links of any content with their friends thinking that it might be helpful.

Demographic features and Facebook use

Table

Demographic and Facebook use related features of students

Variables	Categories	Frequency	Percentage
Age (years)	18.00-20.00	43	18.50
	20.01-22.00	101	43.00
	22.01-24.00	76	32.50
	24.01 and above	14	6.00
Gender	Male	145	62.00
	Female	89	38.00
Year of study	First	55	23.50
	Second	42	17.90
	Third	58	24.80
	Fourth	79	33.80
Years of Facebook use	1.00 and below	75	32.10
	1.01 2.00	78	33.30
	2.01-3.00	55	23.50
	3.01 and above	26	11.10
Facebook used for	Passing time	27	11.5
	A kind of addiction	22	9.4
	Keeping contact with others	136	58.1
	Entertainment	49	20.9
Activities mostly done on Facebook	Making new friendship	36	15.4
	Viewing friends' updates	186	79.5
	Uploading photo/selfie	12	5.1
Hours spent on Facebook per day	1.00 and below	36	15.40
	1.01 -2.00	58	24.80
	2.01-3.00	76	32.50
	3.01 and above	64	27.40
Sharing of link	Yes	159	67.9
	No	75	32.1

Table

Level of real-life social network of students

Levels of social network	Frequency	Percentage
Lower level (0.00 to 10.00)	49	21.23
Average level (10.01 to 20.00)	131	55.60
Higher level (20.01 to 30.00)	54	23.17
Total	234	100

Note: Average level of real-life social network of all students is average, i.e., 16.21.

Table 4 shows that about 21% of students in the study area are lower engaged in real-life social network. On the other hand, majority of the students (55%) in the study area are averagely engaged in real-life social network while 23% of students are highly engaged in real-life social network. From the analysis it is also found that the level of real-life social network among the university students is 16. According to the Lubben Social Network Scale (LSNS), high scores are correlated with greater level of social support and low risk for isolation. Meanwhile, low scores are correlated with depression and other mental health problems. The results of this study show that the students have average level of social network in their real life. There might be multiple reasons behind this. First, the students mainly focus on academic achievements rather than quality of social lives. Second, there might be limited scope for participation in social organizations and lack of social interaction action on the campus. Third, the students may prefer to have social interactions on social media platforms instead of real-life social interaction. The average score in the LSNS indicate that the students are at risk of falling victim to mental health problems. It is a matter of concern that the students are suffering from moderate level of loneliness.

Table

Level of loneliness of university students in Bangladesh

Levels of loneliness	Frequency	Percentage
Lower level (0 to 20.00)	83	35.55
Moderate level (20.01 to 40.00)	115	49.20
Severe level (40.01 to 60)	36	15.25
Total	234	100

Note: Average level of loneliness of all students is moderate, i.e., 27.53.

Table 5 shows only 35% of students are suffering from lower level loneliness. On the other hand, it is found that most of the students (49%) in the study area are suffering from moderate level of loneliness while 15% of students are severely suffering from loneliness. From the analysis one can also find that the level of loneliness among the university students in the study area is 27. This interprets that students are suffering from loneliness in moderate scale in the study area.

Social media (Facebook) use and loneliness

One-way ANOVA test is performed to investigate the impact of social media (Facebook) use on loneliness which implies the statistically significant variation in loneliness level in different categories of students' social media uses. The loneliness impact of social media uses respect to three types of students is analyzed through SPSS 23 and presented in *Table 6*.

Table

The result of one-way ANOVA test

Loneliness	Mean level of loneliness			
	Uses of social media (hours per day)			
	1.00 hour and below	1.01 to 2.00 hours	2.01 hours and above	P value
Lower level	11.23	15.57	18.87	0.03*
Moderate level	23.58	31.21	37.42	0.00**
Severe level	42.28	49.03	58.09	0.01**

Source: Field survey, 2019

Data in the table above shows the mean loneliness for different levels like lower, moderate and severe of both 1 hour and below, 1.01 to 2.00 and 2.01 hours and above uses of social media by the students. The table also shows the level of loneliness of both types of students. Table 6 reveals that the value of loneliness of each level is higher for 2.01 hours and above group of social media users than that of other two groups. It is found from the above table that the mean value of loneliness in lower level for 2.01 hours and above group of social media users is 18.87 while it is 11.23 and 15.57 for 1.00 hour and below, and 1.01 to 2.00 hours group of social media users. This difference is significant at 5 percent level of significance. Like the preceding one, statistical variation in moderate level of loneliness with respect to three different groups of students are

also significant at 1% level of significance. For severe level, statistical variation is found as significant at 1% level of significance.

From the one-way ANOVA analysis, it is found that the value of loneliness is diversified at different groups of students. This means that the students who use social media (Facebook) for a long time (2.01 hours and above) suffer from loneliness more than the students who use social media for a short period of time. Therefore, use of social media is an important factor which has the significant influence on the acceleration of loneliness among students.

Social network, social media use, and academic performance

The result of examining the factors affecting students' academic performance is analyzed through STATA 13 and presented in tabular form in the following table.

Table

Results of linear regression model

Variables	Coefficient	Robust Std. Err.	t value	P value
Constant***	0.971	0.221	4.42	0.01
Class attendance	0.063	0.047	1.33	0.48
Internal evaluation*	0.171	0.085	2.02	0.08
Study hour	0.021	0.013	1.56	0.67
Uses of social media***	-0.843	0.217	-3.89	0.00
Family income	0.034	0.029	1.17	0.25
Participation in co-curricular activities*	0.346	0.080	4.32	0.06
Social network**	0.056	0.016	3.47	0.03
Psychological and economic supports	0.048	0.028	1.72	0.12
Romantic relationship***	0.112	0.054	2.04	0.01
Loneliness***	-0.781	0.171	-4.56	0.00
F (10, 223) = 88.03; Prob > F = 0.000; R^2 = 0.76; Root MSE = 8.11; DW = 1.97				

Note: ***, ** and * means 1%, 5% and 10% level of significance.

Source: Field survey, 2019

Table shows that the value of R^2 is 0.76 indicates that explanatory variables of the model explain the dependent variable by 76 percent. Elsewhere, the F-statistic value is 88.03 with prob>F = 0.000 brings out that the model is

completely good at fitted. The study has no heteroscedasticity problem in the data that is clarified using robust standard error action. The study also exercises VIF to detect multicollinearity problem and explicitly reveals a negative result. The Durbin Watson test (DW = 1.97) expresses that no autocorrelation problem exists in the model. The study finds that internal evaluation, uses of social media, participation in co-curricular activities, social network, romantic relationship and loneliness are the significant variables although all variables fulfill the expected sign.

The estimated coefficient of internal evaluation is 0.171 exhibits that the students' GPA may be increased by 0.171 if the students' internal evaluation is increased by one mark. This is significant at 10% level of significance. The dynamic explanation may be that the more the students get marks in internal evaluation, the more the students improve GPA.

The study also finds that the students' GPA will be decreased by 0.843 if a student uses social media one hour more in a day which is significant at 1% significance level. Students who spend more time on social media (Facebook) feel frustration and suffer from depression and loneliness and hence cannot concentrate on their studies. Consequently, they cannot do well in the examination, and GPA declines.

The coefficient of participation in co-curricular activities reveals that students' GPA may be increased by 0.346 if students participate in co-curricular activities which are significant at 10% level of significance. The rational explanation may be that students who participate in co-curricular activities feel fresh and abstain from depression and loneliness. As a result, they can draw attention in study and do well in academic performance.

Students' GPA may be increased by 0.056 if the level of students' engagement in real-life social network is increased by one. This result is significant at 5% level of significance and can be interpreted by students who are more engaged in real-life social network, get enough space to exchange views with family, relatives, neighbours, etc. As a result, they feel relax and free from depression and loneliness and hence concentrate on studies and perform well. The coefficient of romantic relationship reveals that students' GPA may be increased by 0.112 if students have romantic relationship. The findings are significant at 1% level of significance and can be explained by the fact that students who have romantic relationship can share everything with their partner and feel mentally fresh which keeps them free from depression and loneliness. Thus, they can concentrate on study and do well in academic performance. Finally, the study also finds that students' academic performance, i.e., last year GPA

may be decreased by 0.781 if the level of loneliness is increased by one. This result is significant at 1% level of significance and it can be interpreted by the fact that if a student suffers from loneliness, they cannot concentrate on studies and improve GPA.

Conclusion

The key findings of the study are: First, the participants have average level of social network in their real life; meanwhile most of them are suffering from moderate level of loneliness. Second, the study also finds that there is a positive and significant relationship between social media use and loneliness. Third, the study finds that academic performance or GPA of a student may be decreased by 0.843 and 0.781 if the student uses social media more than one hour a day and suffer from loneliness, respectively. The relationship between social media use and presence of loneliness indicate that impact of social media use is two dimensional. The students having lower level of social networks in their real life feel lonelier and use more social media platforms. The opposite is also true – lonelier students use more social media platforms because they do not have larger social networks in their real life. We also found that the more use of social media platforms negatively affects the academic performance of students.

The main contribution of this article is that it has firstly used some new and effective variables in examining the impact of loneliness on academic performance such as real-life social network, social media use, and participation in co-curricular activities, psychological and financial support, and romantic relationship. Meanwhile, time constraints, lack of funding, limited sample size and covering of geographical area of the country were the main limitation of the study.

University students are future leaders of the country. Therefore, it is recommended that university authorities take necessary steps to increase real-life social networks of the students by ensuring various on-campus activities such as open spaces, clubs, social groups and other forms of social interaction. It is also suggested that more research should be conducted on a wider scale to get a deeper image of the phenomenon in the country.

Acknowledgement

The author acknowledges all the participants of the study for providing cordial supporting during data collection.

Funding

The author received no funds at any level of this research from any government, private or any other institutions.

References

ALAM, M. M., BILLAH, M. A., & ALAM, M. S. (2014). Factors affecting academic performance of undergraduate students at International Islamic University Chittagong (IIUC), Bangladesh. *Journal of Education and Practice*, 5(39), pp. 143–154. Available from: https://www.iiste.org/Journals/index.php/JEP/article/viewFile/1 8568/19198

ALBERTI, B. F. (2018). This 'modern epidemic': Loneliness as an emotion cluster and a neglected subject in the history of emotions. *Emotion Review*, 10, pp. 242–254. DOI: 10.1177/1754073918768876

ALSHAMMARI, A., AL-HARBI, M., ALHAMIDAH, A., ALRESHIDI, Y., & ABDULRAHIM, O. (2017). Association between social media use and depression among Saudi population. *Annals of International Medical and Dental Research*, 4. DOI: 10.21276/aimdr.2018.4.1.me7

BASILISCO, R. & CHA, K. J. (2015). Uses and gratification motivation for using Facebook and the impact of Facebook usage on social capital and life satisfaction among filipino users, *International Journal of Software Engineering and its Applications*, 9(4), pp. 181–194. DOI: 10.14257/ijseia.2015.9.4.19

BROWN, L. & WOOD, M. (1953). Paths of loneliness: The individual isolated in modern society. *American Sociological Review*, 18(6), pp. 712–713. DOI: 10.2307/2088145

BTRC (2019). Internet subscribers in Bangladesh June 2019. Available from: http://www.btrc.gov.bd/telco/internet

BURROW, A. & RAINONE, N. (2017). How many likes did I get?: Purpose moderates links between positive social media feedback and self-esteem. *Journal of Experimental Social Psychology*, 69, pp. 232–236. DOI: 10.1016/j.jesp.2016.09.005

CACIOPPO, J. & DECETY, J. (2009). What are the brain mechanisms on which psychological processes are based? *Perspectives on Psychological Science*, 4, pp. 10–18. DOI: 10.1111/j.1745-6924.2009.01094.x.

CACIOPPO, J. & PATRICK, W. (2009). *Loneliness: Human nature and the need for social connection*. New York, Norton.

CASSIDY, J. & ASHER, S. R. (1992). Loneliness and peer relations in young children. *Child Development*, 63, pp. 350–365. Available from: https://www.ncbi.nlm.nih.gov/pubmed/1611939

CECEN, A. R. (2008). The effects of gender and loneliness levels on ways of coping among university students. *College Student Journal*, 42, pp. 510–516. Available from: https://eric.ed.gov/?id=EJ816934

CLARK, J. L., ALGOE, S. B., & GREEN, M. C. (2018). Social network sites and well-being: the role of social connections. *Current Directions in Psychological Science*, 27, pp. 32–37. DOI: 10.1177/0963721417730833

COHEN, S. (2004). Social relationships and health. *American Psychologist*, 59, pp. 676–684. Available from: http://www.psy.cmu.edu/~scohen/AmerPsycholpaper.pdf

COLE, S., CAPITANIO, J., CHUN, K., AREVALO, J., MA, J., & CACIOPPO, J. (2015). Myeloid differentiation architecture of leukocyte transcriptase dynamics in perceived social isolation. *Proceedings of the National Academy of Sciences,* 112, pp. 15142–15147. DOI: 10.1073/pnas.1514249112

DEMIR, A. (1990). *Some factors that affect the loneliness level of college students*. Hacettepe University.

DEMIR, Y. (2016). The relationship between loneliness and depression: Mediation role of Internet addiction. *Educational Process International Journal*, 5, pp. 97–105. DOI: 10.12973/edupij.2016.52.1

DETERS, F. & MEHL, M. (2012). Does posting Facebook status update increase or decrease loneliness? An online social networking experiment. *Social Psychological and Personality Science*, 4, pp. 579–586. DOI: 10.1177/1948550612469233

DIEHL, K., JANSEN, C., ISHCHANOVA, K., & HILGER-KOLB, J. (2018). Loneliness at universities: Determinants of emotional and social loneliness among students. *International Journal of Environmental Research and Public Health*, 15(9), p. 1865. DOI: 10.3390/ijerph15091865

Digital 2019 (2019). Essential insights into how people around the world use the Internet, mobile devices, social media, and e-commerce. Available from: https://p.widencdn.net/kqy7ii/Digital2019-Report-en [Accessed 28th August 2019].

DODELL-FEDER, D. & GERMINE, L. (2018). Epidemiological dimensions of social anhedonia. *Clinical Psychological Science,* 6, pp. 735–743. DOI: 10.1177/2167702618773740

GALLANT, M. P. (2013). Social networks, social support, and health-related behavior. In: P. E. Nathan, *The Oxford handbook of health communication, behavior change, and treatment adherence*, pp. 305–322.

GOLDSMITH, A. (2013). Social support, social networks, and health. *Journal of Chemical Information and Modeling*, 53(9), pp. 1689–1699. DOI: 10.1017/CBO9781107415324.004

HALL, J., KEARNEY, M., & XING, C. (2018). Two tests of social displacement through social media use. *Information, Communication and Society*, 22(10), pp. 1396–1413. DOI: 10.1080/1369118x.2018.1430162

HIJAZI, S. T. & NAQVI, S. M. M. R. (2006). Factors affecting students' performance: A case of private colleges. *Bangladesh e-Journal of Sociology*, 3(1), pp. 1–10. Available from: https://www.researchgate. net/publication/281060722

HOLT-LUNSTAD, J., SMITH, T., BAKER, M., HARRIS, T., & STEPHENSON, D. (2015). Loneliness and social isolation as risk factors for mortality. *Perspectives on Psychological Science*, 10, pp. 227–237. DOI: 10.1177/1745691614568352

HUANG, C. (2010). Internet use and psychological well-being: A meta-analysis. *Cyberpsychology, Behavior, and Social Networking*, 13, pp. 241–249. DOI: 10.1089/cyber.2009.0217

HUNT, M. G., MARX, R., LIPSON, C., & YOUNG, J. (2018). No More FOMO: Limiting social media decreases loneliness and depression. *Journal of Social and Clinical Psychology*, 751. DOI: 10.1521/jscp.2018.37.10.751

Internet world stats: Usage and population statistics (2019). Internet usage in Asia, Internet users, Facebook subscribers & population statistics for 35 countries and regions in Asia. Available from: https://www.internetworldstats.com/stats3.htm [Accessed 28th August 2019].

ITU (2019). ITU World Telecommunication/ICT Indicators database. Available from: https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx [Accessed 30th August 2019].

JOBE, L.E. & WHITE, S. W. (2007). Loneliness, social relationships, and a broader autism phenotype in college students. *Personality and Individual Differences*, 42, pp. 1479–1489. DOI: 10.1016/j.paid.2006.10.021

KAR-PURKAYASTHA, I. (2010). An epidemic of loneliness. *The Lancet,* 376, pp. 2114–2115. DOI: 10.1016/s0140-6736(10)62190-3

KILLEEN, C. (1998). Loneliness: An epidemic in modern society. *Journal of Advanced Nursing*, 28, pp. 762–770. DOI: 10.1046/j.1365-2648.1998.00703.x

KROSS, E., VERDUYN, P., DEMIRALP, E., PARK, J., LEE, D., LIN, N., SHABLACK, H., JONIDES, J., & YBARRA, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *Plos ONE*, 8. DOI: 10.1371/journal.pone.0069841

LEVENSON, J., SHENSA, A., SIDANI, J., COLDITZ, J., & PRIMACK, B. (2016). The association between social media use and sleep disturbance among young adults. *Preventive Medicine*, 85, pp. 36–41. DOI: 10.1016/j.ypmed.2016.01.001

LIN, L., SIDANI, J., SHENSA, A., RADOVIC, A., MILLER, E., & COLDITZ, J. (2016). Association between social media use and depression among US young adults. *Depression and Anxiety*, 33, pp. 323–331. DOI: 10.1002/da.22466

MEDVENE, L., NILSEN, K., SMITH, R., OFEI-DODOO, S., DILOLLO, A., & WEBSTER, N. (2015). Social networks and links to isolation and loneliness among elderly HCBS clients. *Aging and Mental Health*, 20, pp. 485–493. DOI: 10.1080/13607863.2015.1021751

NETO, R. & GOLZ, N. (2015). Social media use, loneliness, and academic achievement: A correlational study with urban high school students, *Journal of Research in Education,* 25(2).

NOWLAND, R., NECKA, E., & CACIOPPO, J. (2017). Loneliness and social Internet use: Pathways to reconnection in a digital world? *Perspectives on Psychological Science*, 13, pp. 70–87. DOI: 10.1177/1745691617713052

OZDEMIR, U. & TUNCAY, T. (2008). Correlates of loneliness among university students. *Child and Adolescent Psychiatry*, 2, pp. 1–6. DOI: 10.11866/1753-2000-2-29

PRIMACK, B., KARIM, S., SHENSA, A., BOWMAN, N., KNIGHT, J., & SIDANI, J. (2019). Positive and negative experiences on social media and perceived social isolation. *American Journal of Health Promotion*, 33(6), pp. 859–868.

ROSI, M. (2017). Factors affecting academic performance of university evening students. *Journal of Education and Human Development*, 6(1), pp. 96–102. DOI: 10.15640/jehd.v6n1a10

RUGGIERO, T. (2000). Uses and gratifications theory in the 21st century. *Mass Communication and Society*, 3(1), pp. 3–37. DOI: 10.1207/s15327825mcs0301_02

RUSSELL, D., PEPLAU, L. A, & CUTRONA, C. E. (1980). The revised UCLA loneliness scale – concurrent and discriminate validity evidence. *Journal of Personality and Social Psychology*, 39, pp. 472–480. Available from: https://pdfs.semanticscholar.org/9a8f/3d85de78c2fe20eda64eddfb1edaefa46d24.pdf

SADEGHI BAHMANI, D., FARAJI, R., FARAJI, P., HOLSBOER-TRACHSLER, E., & BRAND, S. (2017). Depression and loneliness did not affect academic achievement among university students. *European Psychiatry,* 41, p. S541. DOI: 10.1016/j.eurpsy.2017.01.750

SCHMIDT, N. & SERMAT, V. (1983). Measuring loneliness in different relationships. *Journal of Personality and Social Psychology*, 44, pp. 1038–1047. DOI: 10.1037/0022-3514.44.5.1038

SCOTT, G., BOYLE, E., CZERNIAWSKA, K., & COURTNEY, A. (2018). Posting photos on Facebook: The impact of narcissism, social anxiety, loneliness, and shyness. *Personality and Individual Differences*, 133, pp. 67–72. DOI: 10.1016/j.paid.2016.12.039

SMITH, K. (2019). *126 amazing social media statistics and facts*. Available from: https://www.brandwatch.com/blog/amazing-social-media-statistics-and-facts/#section-10 [Accessed 28th August 2019].

SONG, H., ZMYSLINSKI-SEELIG, A., KIM, J., DRENT, A., VICTOR, A., OMORI, K., & ALLEN, M. (2014). Does Facebook make you lonely?: A meta analysis. *Computers in Human Behavior*, 36, p. 446. DOI: 10.1016/j.chb.2014.04.011

Statista (2019). Global digital population as of July 2019 (in millions). Available from: https://www.statista.com/statistics/617136/digital-population-worldwide/ [Accessed 28th August 2019].

STEERS, M., WICKHAM, R., & ACITELLI, L. (2014). Seeing everyone else's highlight reels: how Facebook usage is linked to depressive symptoms. *Journal of Social and Clinical Psychology*, 33, pp. 701–731. DOI: 10.1521/jscp.2014.33.8.701

STEPTOE, A., SHANKAR, A., DEMAKAKOS, P., & WARDLE, J. (2013). Social isolation, loneliness, and all-cause mortality in older men and women. *Proceedings of the National Academy of Sciences*, 110, pp. 5797–5801. DOI: 10.1073/pnas.1219686110

TOBIN, S., VANMAN, E., VERREYNNE, M., & SAERI, A. (2014). Threats to belonging on Facebook: Lurking and ostracism. *Social Influence*, 10, pp. 31–42. DOI: 10.1080/15534510.2014.893924

TOMA, C. (2013). Feeling better but doing worse: Effects of Facebook self-presentation on implicit self-esteem and cognitive task performance. *Media Psychology*, 16, pp. 199–220. DOI: 10.1080/15213269.2012.762189

UMBERSON, D. K. & MONTEZ, J. (2010). Social relationships and health: A flashpoint for health policy. *Journal of Health and Social Behavior*, 51, pp. S54–S66. DOI: 10.1177/0022146510383501

VALTORTA, N. & HANRATTY, B. (2012). Loneliness, isolation and the health of older adults: Do we need a new research agenda? *Journal of the Royal Society of Medicine*, 105, pp. 518–522. DOI: 10.1258/jrsm.2012.120128

VALTORTA, N., KANAAN, M., GILBODY, S., & HANRATTY, B. (2016). Loneliness, social isolation and social relationships: What are we measuring? A novel framework for classifying and comparing tools. *BMJ Open*, 6, p. e010799. DOI: 10.1136/bmjopen-2015-010799

VALTORTA, N., KANAAN, M., GILBODY, S., RONZI, S., & HANRATTY, B. (2016). Loneliness and social isolation as risk factors for coronary heart disease and stroke: Systematic review and meta-analysis of longitudinal observational studies. *Heart*, 102, pp. 1009–1016. DOI: 10.1136/heartjnl-2015-308790

VICTOR, C., SCAMBLER, S., & BOND, J. (2009). *The social world of older people: Understanding loneliness and social isolation in later life.* Maidenhead, Open University Press.

WEEKS, D., MICHELA, J., PEPLAU, L., & BRAGG, M. (1980). Relation between loneliness and depression: A structural equation analysis. *Journal of Personality and Social Psychology*, 39, pp. 1238–1244. DOI: 10.1037/h0077709

WEISS, R. S. (1973). *Loneliness: The experience of emotional and social isolation.* London, MIT Press. Available from: https://mitpress.mit.edu/books/loneliness

WINKEL, V. M., WICHERS, M., COLLIP, D., JACOBS, N., DEROM, C., & THIERY, E. (2017). Unraveling the role of loneliness in depression: The relationship between daily life experience and behavior. *Psychiatry*, 80, pp. 104–117. DOI: 10.1080/00332747.2016.1256143

WISEMAN, H., MAYSELESS, O., & SHARABANY, R. (2006). Why are they lonely? Perceived quality of early relationships with parents, attachment, personality predispositions and loneliness in first-year university students. *Personality and Individual Differences,* 40, pp. 237–248. DOI: 10.1016/j.paid.2005.05.015

WOLNICZAK, I., C CERES-DELAGUILA, J., PALMA-ARDILES, G., ARROYO, K., SOL S-VISSCHER, R., & PAREDES-YAURI, S. (2013). Association between Facebook dependence and poor sleep quality: A study in a sample of undergraduate students in Peru. *Plos ONE*, 8. DOI: 10.1371/journal.pone.0059087

WOOD, C. (2013). Loneliness: A silent epidemic. *Independent Nurse*. DOI: 10.12968/indn.2013.17.6.99114

XIA, N. & LI, H. (2018). Loneliness, social isolation, and cardiovascular health. *Antioxidants and Redox Signaling*, 28, pp. 837–851. DOI: 10.1089/ars.2017.7312

ZELIKOWSKY, M., HUI, M., KARIGO, T., CHOE, A., YANG, B., & BLANCO, M. (2018). The neuropeptide controls a distributed brain state induced by chronic social isolation stress. *Cell*, 173, pp. 1265–1279. DOI: 10.1016/j.cell.2018.03.037