Bangladesh Journal of MIS
2024, Vol.10, No.02
https://doi.org/10.61606/BJMIS.V10N2.A1
ISSN:2073-9737 (Print), 2410-7077 (Online)

OPEN ACCESS

An Empirical Investigation of the Relationship among Internet Addiction, Emotional Instability, and Academic Performance of Undergraduate Students in Bangladesh

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ABSTRACT

These days, a high level of internet addiction negatively impacts students' activities, creates instability, and can lead to depression, poor time management, and lower academic performance. Therefore, the current study aims to explore the impact of internet addiction on students' academic performance and emotional instability. The emotional effects on academic performance were also analyzed. We conducted this study among 389 university students in Rangpur Division, Bangladesh. We adopted the Partial Least Squares Structural Equation Modelling (PLS-SEM) technique for analysis. We used Smart PLS 4.0 to analyze the data. Here, all hypotheses were accepted. The study found that internet addiction has negatively affected students' academic performance and also has a positive relationship with emotional instability. This emotional instability has negatively affected academic performance. The results of this study will serve as guidelines for people such as students, teachers, parents, and universities. Teachers and universities can create a new policy for internet use. This study can remind parents to better supervise their children's online use by decreasing broadband allotment and monitoring. It can also alert students to the negative impacts of excessive internet use, so they should utilize it carefully for educational objectives.

KEYWORDS: Emotional Instability, Internet Addiction. Academic Performance, Undergraduate Students, Bangladesh.

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ARTICLE HISTORY: ***Received:*** **8 Feb 2024;** ***Revised:*** **05 Nov 2024;** ***Accepted:*** **06 Nov 2024;** ***Published Online:*** **30 June 2025**

1. Introduction

People now use the internet in their daily lives. Today, women of different ages spend a lot of time online (Hecht, 2010). Along with all the advantages that the internet offers, issues with excessive internet use are also emerging. Internet addiction refers to the excessive use of the internet that disrupts daily life. The advent of the digital age has impacted almost every element of modern life (Bhuiyan, 2017). The internet has become an indispensable tool for individuals, leading to significant ramifications in several aspects of society, including social, political, economic, and emotional domains. Individuals use the internet for a wide range of purposes, including communication, commerce, e-commerce transactions (Akter et al., 2023), amusement, and other activities in domestic settings, educational institutions, and public environments.

Particularly, university students' use of the internet and technology has been associated with more frequent communication with friends and relatives (Kwan et al., 2019). According to Long et al. (2018), individuals in their first year of university are at a higher risk of developing internet addiction compared to other demographic groups due to their limited cognitive capacities, lack of self-control, and inadequate coping strategies. Despite the advantages of using the internet, experts have maintained that college students have a higher-than-average chance of becoming addicted to it (Naseem et al., 2021). We need to investigate the significant consequences of internet addiction on student academic performance. Due to internet addiction, students are failing to achieve academic targets such as earning good grades, missing assignment submission deadlines, and being inactive in extracurricular activities (Dou & Shek, 2022).

According to Chang (2012), the use of smartphones has made it more difficult to carry out crucial tasks like study and writing. According to research, using the internet excessively or developing an addiction to it can negatively impact a person's health, social life, and institutional success. Internet use has a positive effect on education by boosting learning strategies and study habits, enhancing communication with classmates and lecturers, reading e-books, and increasing access to academic books and educational resources (Kwok et al., 2021).

2. Literature Review

Globally, internet addiction has gained recognition as a health problem (Kapahi et al., 2013). There have only been fewer than ten years of research on internet addiction (Jiang, 2019). Internet addiction is the inability of a person to manage their online behavior (Tseng et al., 2022). Internet addiction is the term for excessive internet or computer usage that may interfere with or otherwise alter a person's normal daily life (Hansen, 2002). In internet addiction, individuals become dependent on their computer work or the feelings they experience when using the internet, rather than a substance.

University students tend to use the internet more than others. As university students have more free time, less supervision, and plenty of facilities for internet access, they are one of the main categories of people who are internet addicted. Following that line of reasoning, university students are highly susceptible to developing internet addiction, even if using the internet has several advantages, including.

2.1 University Undergraduate Students and Internet Addiction

Undergraduate students at universities have been a popular subject for internet addiction investigations. Researchers believe that undergraduate students at universities are more susceptible to developing internet addiction. Possible clarifications include that the majority of students have a lot of uninterrupted time, that access to the Internet is unlimited and free at universities, that young adults between the ages of 18 and 22 are away from parental supervision for the first time, and that they are having trouble adjusting to university life and making friends.

University undergraduates are better prepared to use the various technological innovations, particularly the Internet, with full support from the university and guardians when using the various Internet applications (Yang & Wu, 2017). Students think that there is no need for social activities in person, and they will get a job according to their choice. They try to avoid class, assignments, presentations, quizzes, and all types of academic activities, as they don't like to invest time in academic purposes. Obviously, the internet has no alternative in our lives, and there are a number of studies on the drawbacks of overusing it. Internet addiction has negative consequences for people's abilities, social behavior, academic achievement, and other areas (Bhuiyan et al., 2023).

According to research, undergraduate students want to use the internet primarily for chatting and making friends, and only a small number (26 percent) of students utilize it for academic objectives. Yang & Wu (2017) looked into how students' use of the internet and social capital affected their academic achievement. Students increasingly rely on the internet to get information and enjoy themselves, according to the survey, and internet use has a negligible effect on attaining grades.

Usman et al. (2014) examined the connection between foreign undergraduate students' academic success and internet addiction at the University of Technology, Malaysia. Their research also revealed gender variations in internet addiction. Kapahi et al. (2013) studied the extent of internet addiction and the intense habit of internet browsing among Malaysian teenagers. The study concluded that Malaysian undergraduate students at university levels face a considerable risk of internet addiction, particularly in the age group of 18 to 25.

2.2 Internet Addiction and Academic Performance

University students primarily use the Internet for academic purposes, but some of them waste time by visiting unrelated websites. A study suggests that internet use has an impact on students' academic performance. Undergraduate students who use the internet frequently visit social networking sites and chat boxes, so they waste their time doing nothing for academic purposes. So, their grades fall due to excessive use of the internet (Leung & Lee, 2016). Students' excessive use of social networking sites (SNS) and engagement in online gaming demonstrates their limited capacity to effectively mitigate instances of internet misuse.

Furthermore, studies (Chou et al., 2005; Yuksel et al., 2012) have found that the phenomenon of internet addiction contributes to academic underachievement and negative consequences within the university

environment. According to Yang & Wu (2017), universities may require students with subpar academic performance to withdraw from their programs. Mahanty & Mishra's (2016) study at Army Medical College in Rawalpindi, India, found a negative correlation between online time and professional test performance. Similarly, students in South Korea perform better academically when using the internet for educational purposes. Conversely, research has linked lower levels of academic achievement to the inappropriate use of the Internet for social or recreational purposes (Leung & Lee, 2016). According to Leung & Lee (2016), adolescents who engage in excessive internet usage often have a tendency to be absent from school and demonstrate deficiencies in their social abilities. We formulate the following hypothesis based on the aforementioned findings:

Hypothesis 1: A negative correlation exists between internet addiction and the academic achievement of university undergraduates.

2.3 Internet Addiction and Emotional Instability

Negative emotions such as anxiety, quickly getting angry, uncertainty, moodiness, tension, nervousness, and depression are examples of emotional instability, sometimes referred to as neuroticism in the Big Five Personality characteristic. Evidence suggests that excessive internet usage can lead to the development of psychological problems, which in turn can affect individuals' Big Five personalities, particularly in terms of emotional instability as well as physical and social challenges (Gwon et al., 2012). Multiple research investigations have demonstrated the association between the phenomenon of internet addiction and the occurrence of depression among adolescents and young adults. Younes et al. (2016) conducted previous research that found individuals enrolled in undergraduate programs exhibited elevated levels of temperamental characteristics, namely neuroticism and psychoticism, compared to other groups of According to the majority of studies, depression is the primary and most noticeable outcome of internet usage.

A person's lack of awareness can lead to internet addiction as they turn to the internet to fill the void (Ozturk & Acaravci, 2013). Spending more time online results in a lack of offline social engagement, which causes alienation and strained relationships with friends and family (Sanders et al., 2000). They are consequently likely to experience more depression (Liang et al., 2016). Researchers have linked the effects of depression to intense fatigue, a loss of energy, and trouble concentrating, leading to feelings of hopelessness, behavioral changes, loss of control, academic failure, social exclusion, and an increase in family problems (Molla et al., 2023). From the above discussion, we propose a hypothesis:

H2: Internet Addiction has a positive relationship with emotional instability.

2.4 Emotional Instability and Academic Performance

Poor academic achievement frequently correlates with emotional instability (Tsagem & Jamilu, 2022). Individuals who are emotionally unstable are unable to cope with stress well (Ahmad, 2018). According to Javeeed et al. (2020), students who exhibited inadequate stress management skills performed unfavourably in their examinations. Students frequently struggle to balance school, tests, assignments, and

extracurricular activities with social life (Bhuiyan, 2023). Students with emotional instability displayed anxiety and stress, and as a result, they lost motivation to engage in their academics (Hadjikou, 2021). As a result, their academic performance suffered.

According to Kwan et al. (2019), the greater the emotional instability among university students, the lower their grades in their academic exams. Anxiety appears to be the biggest driver in high school students' failure on the Basic Standards Tests, according to a similar study directed at United States undergraduate students (Yang & Wu, 2017; Jiang, 2019; and Leung & Lee, 2016) found that stress has a detrimental relationship with academic achievement. Thus, the hypothesis is formed:

H3: Emotional Instability has a negative impact on Academic Performance.

3. Methodology

3.1 Conceptual Framework and Measures

The following (Figure 1) shows the conceptual framework of this study. In this study, there are three main variables: internet addiction, emotional instability, and academic performance. Here, Internet addiction acts as an independent variable, while emotional instability is both an independent and dependent variable. But academic performance is a dependent variable here (Nabila et al., 2017).

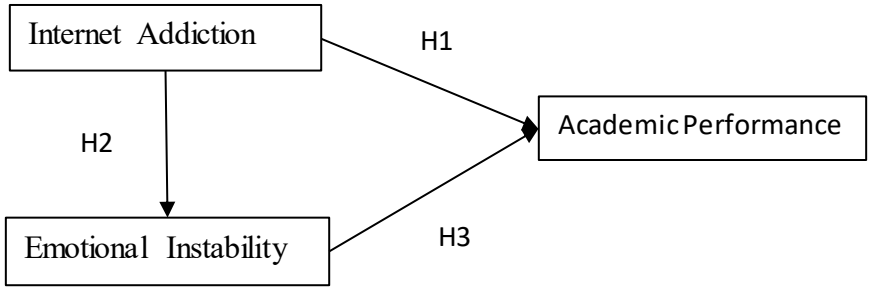

Figure 1: Conceptual Framework.

This is research that uses quantitative methods. As a result, we started by gathering data for analysis. We formulated a research question prior to data collection. We adapted the questions from past research, making them more relevant to the current issue. In order to quantify responses to our questions, we employed a Likert scale with five points. We can categorize our study questions into four distinct groups. The first component covers demographic information; the second section assesses whether or not the individual is addicted to the internet; the third section examines whether or not the individual is emotionally unstable; and the fourth and final section discusses the individual's academic achievement (Yang & Wu, 2017; Jiang, 2019).

Our questionnaire contains 20 items for measuring the internet addiction level of the students (Young & Rogers, 2009). We measure it on a five-point Likert scale, where 1 indicates "strongly disagree," and 5 indicates "strongly agree." This question rating is to identify an individual based on how addictive he or she is. There are a total of 20 questions worth 100 points. An individual's overall score will range from 20 to 100.

A score of less than or equal to 49 indicates normal internet addiction, a score of 50–79 indicates internet addiction and a score of 80–100 indicates high internet addiction (Noreen & Hafeez, 2016). There are seven items from the Big Five Personality Traits Model that contain emotional tests. We used the five-point Likert scale measurement technique here (Bhuiyan et al., 2023). Therefore, the scale ranges from 7 to 35 points. The higher the point achieved by an individual, the more he or she is emotionally unstable. We are setting the values 7–10 as a lower level of instability, 11–25 as a moderate level of emotional instability, and 26–35 as a high level of emotional instability. Finally, we measure academic performance based on the grades students earned in the previous semester, which include quiz tests, midterms, assignments, and presentation grades. This research incorporates three variables.

3.2 Data Collection and sampling

Ten students from the MIS department at Begum Rokeya University, Rangpur, collected the survey data. They hail from eight districts in the Rangpur division. They collected data from December 2022 to January 2023 during their university winter vacation. They were trained before collecting data. We named our research area the Rangpur division. In this division, we selected eight town- or district-level national universities (government colleges) and two public universities for data collection. As the sampling frame was unavailable, we could not use the random sampling method. We selected the respondents based on convenience. Before data collection, we tested the questionnaire on 10 respondents from Begum Rokeya University, Rangpur. The students collected our final data because they found no issues with the questionnaire. We distributed 500 questionnaires to 10 students for data collection. But they were able to collect 389 data points.

4. Results

4.1 Descriptive Statistics

Researchers collected 389 survey data points, but only 335 were valid. 86.12% of responses were valid. Table 4.1 shows demographic responses. 51.6% of respondents were male students (173), while 48.4% of students were women (162). According to the table below, 50.4% of respondents are between 22 and 24, while 4.8% are over 24. Our highest survey response was 39.1% from Arts/Social Science faculty students. Most students use broadband and mobile data for the internet. 44.5% spent less than $500 on the internet. It shows that internet costs are decreasing day by day. In the same way, this survey shows that 31% of students earn $20,000–$30,000 for expenses.

According to the data shown in Table 4.2, the central tendency of internet addiction falls within the range of mild to medium. While it is true that a significant portion of the population exhibits a mild to moderate level of dependence on the Internet, there is a possibility for this phenomenon to escalate in severity. Once 141 percent of those classified as medium-level internet addicts experience a loss of control over their daily screen usage, the group of extremely addicted individuals will become predominant. This communication serves as a cautionary note on the potential detrimental impact of excessive internet usage on one's social interactions and relationships. In communities characterized by medium to severe levels of internet

addiction, there is a notable prevalence of males. Research suggests that there is a disparity in internet addiction across genders, with females exhibiting lower levels of addiction compared to males.

Table 4.1: Demographic Information (Total N=335)

Items	Categories	Frequency (N)	percentage (%)
Gender	Male	173	51.6
	Female	162	48.4
Age	19-21	150	44.8
	22-24	169	50.4
	More Than 24	16	4.8
Faculty	Science	126	37.6
	Business	78	23.3
	Arts/Social Science	131	39.1
Internet Usage	Mobile Data	133	39.7
	Broadband	36	10.7
	Both	166	49.6
Internet Cost	Below 500	149	44.5
	500-800	116	34.6
	800-1000	55	16.4
	More than 1000	15	4.5
Monthly Income	Less Than 20000	97	29
	20000-30000	104	31
	30000-40000	98	29.3
	More than 40000	36	10.7

Table 4.2: Internet Addiction Level

Level of Addiction	Frequency	Male	Female
<=49	163 (100%)	63 (38.65%)	100 (61.35%)
50-79	141 (100%))	86 (60.99%)	55 (39.01%)
80-100	31 (100%))	24 (77.41%)	7 (22.59%)
Total	**335**	**173**	**162**

Table 4.3: Emotional Instability Level:

Level of Instability	Frequency	Male	Female
7-10	121 (100%)	69 (57%)	52 (43%)
11-25	162 (100%))	67 (41.35%)	95 (58.65%)
26-35	52 (100%))	15 (28.8%)	37 (71.2%)
Total	**335**	**173**	**162**

Based on the data shown in Table 4.3, it is evident that the primary tendency for internet addiction-induced emotional instability falls within the mild to medium category. This phenomenon has a significant correlation with the severity of internet addiction. The relationship exhibits a near-proportional correlation. It is noteworthy to notice that whereas males constitute a larger proportion of individuals with medium and severe internet addiction, females include a larger proportion of those with medium and severe emotional instability. The observed phenomenon has a contrasting effect in relation to gender orientation.

4.2 Measurement Model Testing

Table 4.4 displays that the constructs of the study have a composite reliability of between 0.69 and 0.90, which is higher than or very close to the minimum reliability threshold of 0.7 (Straub et al., 2004). As a result, the results demonstrated a high degree of reliability and internal consistency. Examination of AVE, standardized factor loadings, and discriminant validity verified the validity and reliability of the assessment. The convergent validity was strong because all AVE values were greater than 0.5 (Hair et al., 2005). However, we omitted several items due to their low factor loadings or poor conceptual fit (less than 0.69): 3 items from the emotional instability scale and 16 items from the internet addiction scale. We base discriminant validity on cross-loading, and Tables 4 and 5 below illustrate the criteria (Fornell & Larcker, 1981). Table 4.3 demonstrates that the indicators have heavier loadings on their target constructs than on any other. Therefore, the measurement model's discriminant validity has been satisfied. The square root of AVE (diagonals) in Table 4.4 was larger than the values of the other associations. Therefore, we conclude that discriminant validity is optimal.

Table 4.4: Values of Factor Loading, Cronbach's Alpha, Composite Reliability, and Average Variance Extracted.

Variables	Items	Factor Loading	Cronbach's Alpha (a)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Internet Addiction	IA2	0.683	0.777	0.82	0.69
	IA3	0.738			
	IA14	0.787			
	IA15	0.767			
	IA16	0.692			
Emotional Instability	EI25	0.764	0.790	0.809	0.54
	EI26	0.901			
	EI27	0.822			
Academic Performance	AP29	0.712	0.829	0.736	0.636
	AP30	0.874			
	AP31	0.852			

Table 4.5: Discriminant validity: Cross Loading

Items	Academic Performance	Emotional Instability	Internet Addiction
AP (29)	**0.712**	-0.088	-0.09
AP (30)	**0.874**		
AP (31)	**0.852**		
EI (25)	-0.082	**0.764**	0.361
EI (26)	-0.099	**0.901**	0.539
EI (27)	-0.031	**0.822**	0.395
IA (14)	-0.077	0.5	**0.787**
IA (15)	-0.028	0.436	**0.767**
IA (16)	-0.074	0.324	**0.692**
IA (2)	-0.123	0.296	**0.683**
IA (3)	-0.042	0.338	**0.738**

Table 4.6: Discriminant validity: Fornell-Larcker criterion

Variables	Academic Performance	Emotional Instability	Internet Addiction
Academic Performance	**0.82**		
Emotional Instability	-0.088	**0.831**	
Internet Addiction	-0.09	0.531	**0.735**

4.3 Structural Model

Table 4.7 provides an evaluation of the submitted hypotheses, demonstrating their thorough examination. The findings demonstrate that all of the hypotheses have received support. The evidence suggests that H1 is substantiated by the prevalence of Internet addiction among students in Rangpur City, which is further compounded by its detrimental effect on academic performance ($\beta = -0.182$, $t > 1.96$, and $p < 0.05$). We can attribute this phenomenon to the fact that all these values fall within the permitted range (Fornell & Larcker, 1981). The second hypothesis is accepted based on the same rationale as the first hypothesis, since its value falls within the acceptable range ($\beta = -0.093$, $t > 1.96$, and $p < 0.05$). Conversely, the acceptance of the third hypothesis is also evident in the findings, which indicate a significant negative correlation between emotional instability and academic achievement ($\beta = -0.307$, $t > 1.96$, and $p < 0.01$).

Table 4.7: Testing results of Hypothesis

Hypothesis	Relationship	Beta Values	T Value	P Values	Decision
H1	Internet Addiction -> Academic Performance	-0.182	3.183	0.001	Supported
H2	Internet Addiction -> Emotional Stability	0.093	3.859	0.039	Supported
H3	Emotional Instability -> Academic Performance	-0.307	4.973	0.000	Supported

5. Discussion

We formulated three hypotheses in the present study, drawing upon the findings of prior research. The findings of our study indicate that there is a significant negative relationship between Internet addiction (H1) and academic performance. Excessive internet usage has the potential to impact academic achievement negatively. Our study's findings are consistent with previous research by Nabila et al. (2017), Usman et al. (2014), Babadi et al. (2014), and Javaeed et al. (2020), which has consistently shown a negative impact of Internet addiction on academic performance and a correlation with compromised mental well-being due to excessive non-study-related Internet usage. ever, Younes et al. (2016) conducted a study that found no significant correlation between Internet addiction and students' academic performance. The study's sample of high school pupils utilized the internet under parental supervision. As a result, the influence of their internet addiction on their academic performance remains negligible.

According to the results of our subsequent experimental investigation, there is a direct correlation between internet addiction and emotional instability. The escalation of emotional instability positively correlates with the extent to which students engage in addictive behaviors. The results align with the conclusions reported in previous studies conducted by Nabila et al. (2017), Effatpanah et al. (2020), and Jensen-Campbell et al. (2022). The prevalence of internet addiction has resulted in a decline in individuals' emotional intelligence. As a direct result, the pupils' emotional instability leads to a decline in their academic performance.

The second hypothesis, emotional instability (H2), has a significantly adverse correlation with academic achievement. The research by Nabila et al. (2017) and Sarkar & Chakraborty (2021) finds support in this finding. The research findings suggest a positive correlation between a higher degree of emotional instability and higher levels of academic accomplishment, while a lower degree of emotional instability correlates with lower academic performance. Adegboye et al. (2021) did not find evidence to support a significant

correlation between emotional instability and academic accomplishment, contrary to expectations. The primary difference between this segment region and the present investigation is their dissimilarity.

6. Conclusion, Implications, and Limitations of the Study

6.1 Conclusion

Academic performance serves as the primary metric for evaluating any student. The study concludes that emotional instability and internet addiction can negatively affect academic performance. High internet addiction and emotional instability cause low academic performance in students (Alam et al., 2022). This high level of internet addiction also leads to emotional instability. This research aims to offer a valuable contribution to the scholarly discourse around the examination of emotional stability and its impact on academic accomplishment. Furthermore, it seeks to inspire parents, teachers, policymakers, and other stakeholders to prioritize the development of students' emotional stability, therefore fostering their potential to become valuable contributors to society (Khanom et al., 2022). This study lays the groundwork for future investigations aimed at enhancing educators' comprehension of the correlation between internet addiction, emotional instability, and academic achievement. This framework offers a set of recommendations aimed at improving students' academic performance through comprehensive knowledge of their emotional well-being and the impact of internet addiction.

6.2 Implication

The findings of the analysis have multiple implications for students, parents, teachers, and universities. Students should first consider internet addiction. They should be aware of the consequences of using the internet. If they change their habit of using the internet, they can control their emotions, which leads to high academic performance. Secondly, parents should also control their children by reducing their internet budget and monitoring all of their activities on a continuous basis. Thirdly, the teacher should pay attention to the students who consistently perform poorly academically. He can help counsel the students by finding the causes of these poor academic results (Amin et al., 2024). And lastly, the university can impose new rules and regulations for using the Internet on campus. The university can also increase the student's awareness of the negative effects of internet addiction through campaigns, flyers, and seminars, which might lead to early prevention of internet addiction problems. It is also suggested that every university should have a counseling center for student support, as internet addiction has a very positive impact on emotional instability (Islam et al., 2024).

6.3 Limitations

This study has a few limitations because it considers only university students. If the sample size can be increased, the findings of the study will be more generalized. The emotional instability can't be defined appropriately in this paper. Other factors, such as the quality of the teacher, the educational environment, facilities, and the students themselves, influence academic performance. To gain comprehensive insights into the determinants that impact internet addiction, this study warrants additional investigation to expand the breadth and geographical coverage of its research framework.

Funding

This research received no external funding.

Acknowledgments

10 students from the MIS department have collected the data. All individuals have consented to the acknowledgment of their support and cooperation in data collection.

Conflicts of Interest

The authors declare no conflict of interest.

Citation

Alam, S. M. A., Rahoman, M. M., Bhuiyan, M. R. I., & Akter, M. S. (2024). An empirical investigation of the relationship among internet addiction, emotional instability, and academic performance of undergraduate students in Bangladesh. *Bangladesh Journal of MIS, 10*(2), 1–15. https://doi.org/10.61606/BJMIS.V10N2.A1

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