



# **Effect of Internet Usage on the Academic Achievement of Secondary School Students**

**Ruma Manna<sup>a++</sup> and Ratan Sarkar<sup>b##</sup>**

<sup>a</sup> Department of Teacher's Training (B.Ed.), Subhash Chandra Basu B.Ed. Training College, (Affiliated to Baba Saheb Ambedkar Education University), Jararnagar, Heria, Purba Medinipur, Contai, West Bengal-721430, India.

<sup>b</sup> Department of Teachers' Training (B.Ed.), Prabhat Kumar College, Contai, (Affiliated to Vidyasagar University), West Bengal – 721404, India.

## **Authors' contributions**

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

## **Article Information**

DOI: <https://doi.org/10.9734/ajess/2024/v50i121693>

## **Open Peer Review History:**

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/128047>

**Original Research Article**

**Received: 07/10/2024**  
**Accepted: 10/12/2024**  
**Published: 13/12/2024**

## **ABSTRACT**

This study investigated the effect of Internet usage on secondary school students' academic achievement under the West Bengal Council of Secondary Education (WBCSE), focusing on variables such as gender and academic classes (IX and X). Using a purposive sampling method, the researcher selected 100 students from Classes IX and X at a school in Contai and administered an internet usage questionnaire. This study tested several null hypotheses using the Pearson product-moment correlation coefficient and an independent sample t-test. The results showed no

<sup>++</sup> Assistant Professor of Education;

<sup>#</sup> Assistant Professor of Education (Stage - II);

<sup>\*</sup>Corresponding author: Email: [ratanedu@pkcollegecontai.ac.in](mailto:ratanedu@pkcollegecontai.ac.in);

significant differences in Internet usage and academic achievement between male and female students. It was also found that Class IX students used the internet more than Class X students, suggesting that lower internet usage is linked to higher academic achievement.

*Keywords: Academic achievement; internet usage; effect; secondary students.*

## 1. INTRODUCTION

In the present scenario, internet dependence is increasingly evident across various aspects of life, including education. The Internet, which represents the largest repository of human knowledge ever assembled, is extensively used by students and educators for teaching and learning purposes (Castells, 2010). It has been shown to positively influence academic performance by providing access to a vast array of resources and facilitating better educational outcomes (Khan 2017).

However, the potential for excessive Internet use presents significant concerns for parents, schools, and communities. Research indicates that excessive Internet usage can lead to difficulties in maintaining a regular daily routine, adversely affecting school performance and straining family relationships (Andreassen et al., 2016). Additionally, excessive Internet use is associated with various health issues, including physical problems such as poor posture and eye strain as well as mental health issues such as anxiety and depression (Young, 2009). These adverse effects underscore the need for balanced and mindful internet usage to ensure that it remains a beneficial tool for academic and personal development.

### 1.1 History of Internet

The history of the Internet can be traced back to the development of early networking protocols and technologies. Initially, ARPANET, the precursor to the modern Internet, used the Network Control Program (NCP) as its primary networking protocol. However, in 1983, the NCP was replaced by the Transmission Control Protocol/Internet Protocol (TCP/IP), a suite of protocols (Kahn & Cerf, 1985). This transition marked the beginning of the widespread adoption of TCP/IP, which remains the dominant global network protocol (Kahn & Cerf, 1985). By 1990, ARPANET was decommissioned and succeeded by the NSFNET (National Science Foundation Network), which expanded the scope and reach of networked communication (Leiner et al., 2009). In 1995, Tim Berners-Lee, a

pioneering computer scientist, introduced the World Wide Web, along with the key technologies that underpin it today, such as Hypertext Markup Language (HTML), Hypertext Transfer Protocol (HTTP), Uniform Resource Locators (URLs), and web browsers (Berners-Lee, 1995). These innovations have significantly shaped the Internet.

### 1.2 The Uses of the Internet

As a technological innovation, the Internet represents the most extensive collection of human knowledge ever assembled, facilitating faster communication, interaction, social organization, and problem-solving across global communities (Castells, 2010).

**Access to Information:** One of the primary functions of the Internet is its ability to disseminate information rapidly, which supports various awareness campaigns and enables widespread access to knowledge (Mossberger, Tolbert, & McNeal, 2008).

**Communication:** The Internet has revolutionized communication by providing alternatives to traditional methods such as handwritten letters. Platforms such as email, Skype, WhatsApp, Facebook, and Messenger have become integral to daily interaction (Pew Research Center, 2015).

**Education and Self-Improvement:** The advent of online courses and workshops have expanded opportunities for education and personal development, offering flexible learning options that cater to diverse needs (Allen & Seaman, 2013).

**Electronic Newspapers and Magazines:** The Internet serves as a source of up-to-date information, including breaking news, weather, and sports, through digital newspapers and magazines (Newman et al., 2020).

**Social Networking:** Students use the Internet to connect with friends and family, and stay updated on current events through social networks. Popular platforms include Facebook,

Twitter, and Instagram, although many other networks also exist (Smith 2013).

**Job Searching:** The Internet facilitates job searching by connecting users with job opportunities through numerous websites and mobile applications available in various countries (Bureau of Labor Statistics 2021).

**Online Shopping:** E-commerce has grown significantly, with platforms such as eBay and Amazon providing a wide range of products for online purchases, enhancing convenience and accessibility for consumers (Laudon & Traver, 2020).

**Entertainment:** The Internet offers extensive entertainment options, including video and computer games, which allow individuals to play online with friends and players worldwide (Vasalou et al., 2008).

### 1.3 Disadvantages of the Internet

While the Internet offers numerous advantages, it also presents several notable disadvantages that users should be aware of.

**Extra Expenses:** Despite many services being offered "for free" online, users often incur additional costs through increased electricity bills from the constant use of electronic devices and internet services (Zickuhr & Smith, 2013).

**Social Disconnect:** The Internet's convenience can lead to social isolation, as individuals might become more engaged in online activities and less engaged in real-world interactions, which can negatively affect their social relationships and mental well-being (Turkle, 2011).

**Unhealthy Lifestyle:** The sedentary nature of prolonged internet use contributes to physical health issues such as weight gain and poor posture. Additionally, excessive screen time can cause visual problems in the eyes (American Academy of Pediatrics, 2016).

**Personal Information Risks:** Online shopping and other Internet activities pose risks to the security of personal information. Users may become victims of identity theft or financial fraud if their personal data are compromised (Furnell and Clarke, 2012).

**Pornography Exposure:** The accessibility of explicit content on the Internet can negatively

impact children and adolescents. Ease of access makes it challenging for parents to monitor and control their children's exposure to inappropriate materials (Wolak, Mitchell, & Finkelhor, 2007).

**Account Hacking:** Online accounts are vulnerable to hacking, especially if devices are lost or stolen. Unauthorized access to personal accounts can lead to significant financial losses and privacy breaches (Nash & Kumer, 2018).

**Misinformation:** The prevalence of false information on the internet can mislead users. Many websites and channels publish inaccurate news to attract attention, making it essential to rely on verified and secure sources (Pennycook and Rand, 2018).

### 1.4 Academic Achievement

Academic achievement refers to the measurable success an individual attains in their educational endeavors, encompassing the knowledge and skills acquired in various subjects. It is often evaluated through assessments and tests designed by educators or institutions that gauge students' understanding and proficiency in specific areas (Harris, 2011). Academic achievement is crucial because it serves as a criterion for selection, promotion, and recognition in both academic and professional settings (Crocker & Wolfe, 2001).

Academic achievement involves reaching standards of excellence and demonstrating success in educational tasks. It is not solely about attaining high grades, but also about the intrinsic motivation to excel and achieve mastery in challenging situations. This motivation is deeply rooted in the basic psychological and biological needs of students, driving them to surpass their peers and achieve their personal and academic goals (Deci & Ryan, 2000). The pursuit of academic excellence often fosters a sense of pride and satisfaction, reflecting an individual's commitment to educational growth and performance (Zimmerman, 2000).

In summary, academic achievement is a multifaceted concept that encompasses objective measures of performance and subjective experiences of success and mastery. It plays a significant role in shaping students' educational trajectories and is a central focus for educators who aim to support students' growth and development.

## 1.5 Factors of Academic Achievement

In recent years, there has been growing awareness among parents and students about the significance of academic achievement. Many believe that poor performance on examinations can adversely affect a student's future success. Consequently, students are expected to excel in various school activities to meet their expectations.

Several factors contribute to individual differences in academic achievement including intelligence, personality traits, parental influence, classroom instruction, and physical activity. Intelligence and personality traits have been closely linked to academic success. Research has shown that students with higher IQs and those who score high in conscientiousness, which relates to effort and achievement motivation, tend to perform better academically (Robinson and Shaver 1973). Additionally, mental curiosity, as measured by intellectual engagement, significantly impacts academic achievement, beyond intelligence and conscientiousness (Sternberg, 2003).

Parental academic socialization plays a crucial role in shaping children's academic skills, behavior, and attitudes. This influence is often influenced by parents' socioeconomic status. Educated parents typically create a more stimulating learning environment that can positively impact their children's academic performance (Hill & Tyson, 2009). The values, expectations, and resources provided by parents significantly contribute to academic outcomes.

Classroom instruction also plays a vital role in students' achievement. Teachers influence their academic success through instructional methods, expectations, and assessments. Effective teaching involves presenting material in a comprehensible manner and engaging students with meaningful learning experiences. When instruction is poorly delivered or lacks engagement, students may struggle to meet expected levels of achievement (Hattie, 2009).

Physical activity has also been shown to enhance academic performance. Regular exercise increases neural activity in the brain, leading to improved executive functions, such as attention span and working memory. These cognitive benefits are associated with improved academic outcomes (Hillman et al. 2008).

In summary, academic achievement is influenced by a combination of cognitive, environmental, and behavioral factors. Understanding these elements can help educators, parents, and students to create conditions that support academic success.

## 1.6 Statement of the Problem

The rapid integration of the Internet into students' lives has significantly influenced learning patterns and academic outcomes. While the Internet offers vast educational resources, its impact on academic achievement remains mixed, with potential benefits and drawbacks influenced by usage patterns, gender, and socio-economic contexts (Kaur, 2018; Lenhart et al., 2015). This issue is particularly relevant for rural secondary school students in West Bengal, where digital access and academic pressures intersect. The study seeks to explore the relationship between Internet usage and academic achievement, focusing on gender and grade-level differences, to provide insights into its role in shaping educational outcomes.

## 1.7 Rational of the Study

The rationale behind this study is grounded in the significant impact of Internet usage on students and educational institutions. As social networking sites and online resources have become increasingly popular, the Internet has become an integral part of students' daily lives. The pervasive use of the Internet among students presents both opportunities and challenges to academic performance. Institutions can leverage this trend by investing in enhanced internet facilities to support academic growth and improve student outcomes. Evidence suggests that the strategic use of Internet resources can lead to better academic performance and more effective learning experiences (Jiang 2015). For instance, access to high-quality online educational tools and platforms can facilitate personalized learning and provide students with valuable resources that complement traditional classroom instruction (Zhang and Zhang 2018). However, the Internet's potential for distraction is a significant concern. Excessive Internet use, particularly on social networking sites and for recreational purposes, can lead to time wastage and negatively impact academic achievement (Junco, 2012). Research indicates that students who spend excessive time online may experience diminished academic performance due to reduced study time and increased

procrastination (Rosen, Carrier, & Cheever, 2013). This study aims to provide a comprehensive analysis of how Internet usage affects academic achievement, offering insights into how students can maximize the benefits of Internet resources while minimizing their potential drawbacks. By understanding these dynamics, educational institutions can implement strategies to enhance Internet facilities and develop programs that encourage productive online behavior among students.

### 1.8 Objectives of the Study

The objectives of this study are as follows:

1. To identify Internet usage among secondary school students.
2. To identify the level of academic achievement among secondary school students.
3. To compare the Internet usage of secondary students with respect to different categorical variables, such as gender and academic classes (IX and X).
4. To identify the relationship between Internet usage and academic achievement among secondary school students.

### 1.9 Hypotheses of the Study

The hypotheses of this study are as follows:

Ho1: There is no significant difference between male and female secondary students with respect to Internet usage.

Ho2: There is no significant difference between male and female secondary students with respect to their academic achievement.

Ho3: There is no significant difference between 9<sup>th</sup> and 10<sup>th</sup> grade students with respect to their Internet usage.

Ho4: There is no significant relationship between Internet usage and academic achievement among secondary school students.

### 1.10 Delimitation of the Study

The present study was limited by the following aspects:

The sample was selected only from the District of Purba Medinipur of West Bengal.

The sample consisted of only secondary school students.

## 2. REVIEW OF LITERATURE

The effect of Internet usage on academic achievement has been the subject of extensive

research, which has revealed diverse outcomes across different educational levels and contexts. Maiti (2017) examined the impact of Internet usage on the academic performance of higher secondary students in West Bengal under the WBCHSE. By administering an internet usage questionnaire to 138 Class XI students selected through purposive sampling, Maiti employed Pearson's product-moment correlation coefficient and an independent sample t-test to test the hypotheses. The results indicated a negative relationship between Internet usage and academic achievement, suggesting that higher Internet usage could diminish students' academic performance. This finding aligns with concerns about potential distractions associated with excessive internet use.

In contrast, Muhammad Musaud Asdaque (2010) explored the broader implications of Internet usage on the academic performance, social life, and outdoor activities of Pakistani university students. While this study highlights the impact of Internet usage on various aspects of students' lives, it underscores the need to understand the correlation between Internet use and social life among university students. However, this study fails to establish a direct link between Internet usage and academic performance, leaving a gap in understanding the interplay between social and academic aspects.

Suri and Sharma (2012) investigated the influence of internet access and weekly usage rates on self-learning activities, communication, group activities, and information-collection tasks among students. Their findings demonstrated a significant positive relationship between Internet usage and these factors, highlighting the constructive role of the Internet in educational activities. This study provides a counterpoint to Maiti's findings by suggesting that structured and purposeful Internet use can enhance academic outcomes by improving learning and communication skills.

Mashhor and Saad (2014) focused on the prevalence of internet addiction among secondary school students in Riyadh and its correlation with depression. Their results indicate that Internet addiction has detrimental psychological, physical, and social effects on adolescents, necessitating preventive and therapeutic interventions. This study introduces a critical dimension of mental health, illustrating how excessive or maladaptive Internet use can negatively influence overall well-being, which in turn may affect academic performance.

Mahantil and Chandra (2016) analyzed internet dependency among undergraduate students, examining variations in internet use patterns based on gender, field of study, and residence. Their findings revealed that while Internet use patterns differed by gender and study stream, residence had no significant effect. This study emphasizes that Internet dependency is influenced by individual characteristics, which may further affect academic outcomes.

Jibrin et al. (2017) investigated the effects of internet usage on the academic performance of students in tertiary institutions in Niger State, Nigeria. This research identified the Internet as a beneficial tool in academic exercises within the ICT era, underscoring the positive role that the Internet can play in supporting educational pursuits when used appropriately.

Hossain (2018) explored the influence of ICT on the academic achievement of students at Holy Child Senior High School in Cape Coast. This study specifically examined how ICT enhances academic achievement, the alternative uses of ICT/Internet facilities, and its effects on students' moral behavior. Hossain's findings highlight the dual-edged nature of ICT, where the Internet serves as a valuable educational resource, but also poses risks to students' moral conduct if not regulated effectively.

Finally, Franklin Adjoa Yebowaah (2018) investigated the impact of internet use on senior high school students in Wa Municipality. The study concluded that Internet access positively influences academic achievement, suggesting that when students primarily use the Internet for academic purposes, it can enhance their educational outcomes.

The reviewed studies present a complex picture of the relationship between Internet usage and academic achievement. While some studies have highlighted the potential negative impacts of excessive Internet use, others have demonstrated the benefits of structured and purposeful Internet engagement. These varied findings underscore the importance of context, the nature of Internet use, and individual differences in shaping the outcomes of Internet usage on students' academic performance. These insights suggest that balanced and regulated Internet use is crucial to harnessing its potential benefits while mitigating the associated risks.

This study reviews several empirical investigations on the impact of Internet usage on students' academic achievement. The literature indicates that students predominantly use the Internet for communication, followed by accessing information. There are notable differences in Internet usage patterns between boys and girls, with gender significantly influencing Internet use. Overall, internet access has been found to positively affect students' academic performance, social life, and outdoor activities.

However, excessive Internet use can lead to negative outcomes, potentially impairing cognitive functions, learning, academic achievement, and overall work-life balance.

The Internet offers a broad spectrum of benefits, including social connectivity, entertainment, and access to academic and scientific information. While educational and communicative use of the Internet positively correlates with academic success, recreational use tends to negatively impact academic outcomes. This dual effect highlights the complexity of Internet usage and its varied implications for student achievement.

In light of these findings, this study aims to explore the specific effects of Internet usage on the academic achievement of secondary school students, particularly focusing on identifying the nuanced influences of different types of Internet activities. By addressing these aspects, this study seeks to fill the existing gaps in the literature and provide a clearer understanding of the conditions under which Internet usage can either support or hinder academic success among secondary school students.

### 3. METHODOLOGY

**Research Design:** In this study, a quantitative approach was adopted because of its specific advantages and alignment with the nature of the research. A descriptive survey design was used in this study. This method of investigation aims to describe and interpret existing conditions, practices, needs, attitudes, and beliefs as they currently exist. The descriptive survey approach allows for a systematic examination of the variables under study, providing a comprehensive overview of the phenomena related to it, and ensuring that the tool is culturally and linguistically appropriate for the target population in the study.

**Sampling Technique:** The present study included a sample of 100 students from a government school in Contai, located in the Purba Medinipur District of West Bengal. The sample considers various strata, such as gender and class, to ensure adequate representation of these aspects. Students were selected using convenience sampling techniques, specifically purposive sampling, to meet the study's requirements and objectives.

**Variables of the Study:** The present study included one independent variable, Internet usage, and one dependent variable, academic achievement. In addition, several moderator variables were considered in the study:

Sex: Male (n = 30) and Female (n = 70).  
Class: IX (50), X (50).

**Tools of the Study:** The tools employed distinctive ways of describing and quantifying data to carry out the research work, and the following questionnaire tools were used to collect the data from the sample subjects. In the present study, the researcher utilized an edited and modified version of the Internet Usage Scale for Students, originally developed by Shaloo Saini (Jalandhar) and Dr. Parminder Kaur (Hoshiarpur). The modified scale consisted of 20 items and had a high-reliability coefficient of 0.91, indicating strong internal consistency. The scale employs a quantitative scoring method based on a five-point Likert scale, which allows for the assessment of various levels of internet usage among students. The academic score for each student in the study was determined by taking the total percentage of marks obtained in their final examinations of the previous classes, specifically, Classes VIII and IX. This approach provides a standardized measure of academic achievement, allowing for an analysis of the relationship between Internet usage and academic performance among students.

**Data Collection Procedure:** The researcher collected data from Jukiveri Matangini Vidyapith in Contai, Purba Medinipur District of West Bengal. Data collection involved administering a 20-item questionnaire to the students. The researcher provided clear instructions on how to complete the questionnaire and assisted any students who had difficulty understanding the specific items. Adequate time was allocated to ensure that the students could read, comprehend, and respond to the questionnaire in an objective manner. This approach ensured that the collected data were both reliable and valid.

**Data Analysis Techniques:** The Statistical Package for the Social Sciences (SPSS) version 17.0 program was used to analyze the data. The responses were coded numerically and then input into SPSS 17.0. Correlation tests were used to determine the relationships between the variables under study. Descriptive statistics, independent sample t-tests, and Pearson's coefficient of correlation were calculated for multiple comparisons among variables statistically and, subsequently, to test the null hypothesis. The details of the statistical analysis used for the entire sample and the corresponding results, along with their interpretation, are given in the following sections.

#### 4. ANALYSIS AND RESULTS

The following tables provide descriptive statistics for Internet usage and academic achievement scores of 100 secondary school students. These tables offer insights into the central tendency, variability, and distribution patterns of the data, helping to understand how these factors relate to the overall academic performance and digital behavior of students.

Table 1 presents the descriptive statistics of Internet usage scores, providing a comprehensive view of the student's engagement with the Internet. The analysis of Internet usage scores showed (Table 1) a mean of 56.21, with a standard deviation of 11.20, indicating moderate variability in students' Internet usage. The scores have a range of 57, with a minimum value of 32 and a maximum value of 89, reflecting diverse usage patterns among the 100 students.

The skewness value of 0.541 suggests a slight positive skew in the distribution, indicating that more students scored below the mean compared to those above it. The kurtosis value of 0.263 indicates a distribution that is slightly more peaked than normal but not significantly so. This highlights the variability and central tendency of Internet usage among the sample population.

The analysis of academic achievement scores revealed (Table 2) a mean of 60.11, with a standard deviation of 14.47, suggesting moderate variability in students' performance. The scores spanned a range of 57, from a minimum of 32 to a maximum of 89, reflecting a broad dispersion of academic performance within the sample of 100 students.

**Table 1. Descriptive Statistics of Internet Usage Scores**

Scale	N	Range	Minimum	Maximum	Mean	Std Deviations	Skewness	Kurtosis
Internet Usage Scale	100	57.00	32.00	89.00	56.2100	11.20001	.541	.263

**Table 2. Descriptive Statistics of Academic Achievement Scores**

Scale	N	Range	Minimum	Maximum	Mean	Std Deviations	Skewness	Kurtosis
Academic Achievement Scale	100	57.00	32.00	89.00	60.1070	14.47167	.005	-.885

**Table 3. Testing of Null Hypothesis Ho1**

Testing of Hypothesis	Independent Variable	N	Gender	Mean	SD	df	t-value	Remarks
Ho1	Internet Usage	30	Male	51.47	12.40	46.14	-2.642	(p=0.134) Not Significant
		70	Female	58.24	10.07			

**Table 4. Testing of Null Hypothesis Ho2**

Testing of Hypothesis	Independent Variable	N	Gender	Mean	SD	df	t-value	Remarks
Ho2	Academic Achievement	30	Male	61.20	14.20	56.57	0.497	(p=0.914) Not Significant
		70	Female	59.64	14.66			

**Table 5. Testing of Null Hypothesis Ho3**

Testing of Hypothesis	Independent Variable	N	Class	Mean	SD	df	t-value	Remarks
Ho3	Internet Usage	50	IX	58.90	12.80	98	-2.462	(p=0.031) Significant
		50	X	53.52	8.66			

**Table 6. Testing of Null Hypothesis Ho4 (Correlation Analysis)**

Variables	Pearson Correlation	Sig (2-Tailed)	Remarks
Internet Usage & Academic Achievement	-0.030	0.769	No Significant Correlation
Internet Usage & Academic Achievement (Spearman)	-0.002	0.984	No Significant Correlation



The skewness value of 0.005 indicates that the distribution is approximately symmetric, with no significant skew in the data. The kurtosis value of -0.885 suggests a platykurtic distribution, indicating that the data has lighter tails and is less peaked than a normal distribution. This suggests that extreme values are less common than in a normal distribution, providing insights into the variability of academic achievement scores.

**Hypothesis 1 (Ho1):** There is no significant difference between male and female secondary school students with respect to Internet usage.

The independent sample t-test yielded a t-value of -2.642, which is not significant at the 0.05 level ( $p = 0.134$ ). Thus, the null hypothesis is not rejected. This indicates that there is no statistically significant difference in Internet usage between male and female secondary students.

**Hypothesis 2 (Ho2):** There is no significant difference between male and female secondary school students with respect to academic achievement.

The t-value of 0.497 is not significant at the 0.05 level ( $p = 0.914$ ). Therefore, the null hypothesis is not rejected. This indicates no statistically significant difference in academic achievement between male and female students.

**Hypothesis 3 (Ho3):** There is no significant difference between 9th and 10th-grade students with respect to their Internet usage.

Based on the t-test results (Table 3), we reject the null hypothesis (Ho3) because the p-value is 0.031, which is below the threshold of 0.05. This indicates that there is a significant difference in the Internet usage scores of 9th-grades and 10th-grade students. Specifically, Class IX students are using the Internet more on average than Class X students, suggesting that grade level may influence Internet usage patterns among secondary school students.

**Hypothesis 4 (Ho4):** There is no significant relationship between Internet usage and academic achievement among secondary school students.

The Pearson correlation coefficient is -0.030 ( $p = 0.769$ ), and the Spearman correlation coefficient is -0.002 ( $p = 0.984$ ). Both values indicate no significant correlation between Internet usage and academic achievement. The slight negative

relationship suggests that increased Internet usage does not significantly impact academic performance.

## 5. DISCUSSION

The findings of this study shed light on several critical aspects of secondary school students' Internet usage and academic achievement, offering insights into the interplay between these variables and how they vary by demographic factors.

**Internet Usage Patterns:** The descriptive statistics reveal moderate variability in Internet usage among students, as evidenced by the mean score of 56.21 and a standard deviation of 11.20. The slight positive skewness suggests that a majority of students fall below the average usage, with a few outliers who use the Internet extensively. Interestingly, no significant gender differences were observed in Internet usage ( $t = -2.642$ ,  $p = 0.134$ ), highlighting a relatively uniform pattern of Internet engagement among male and female students. This aligns with recent studies suggesting a narrowing digital gender divide among younger populations as Internet access becomes increasingly ubiquitous. However, a significant difference was found between 9th and 10th-grade students' Internet usage ( $t = -2.462$ ,  $p = 0.031$ ), with 9th-graders reporting higher levels of usage. This disparity could be attributed to differing academic pressures, as 10th-grade students may limit non-academic Internet use due to the demands of board examinations. It emphasizes the need to explore grade-specific interventions for responsible and purposeful Internet use.

**Academic Achievement:** The analysis of academic achievement scores revealed moderate variability, with a mean score of 60.11 and a standard deviation of 14.47. The near-symmetry of the distribution (skewness = 0.005) suggests a balanced performance among students. Gender differences in academic achievement were found to be statistically insignificant ( $t = 0.497$ ,  $p = 0.914$ ), consistent with global trends in educational research showing parity in performance between male and female students.

**Relationship Between Internet Usage and Academic Achievement:** The correlation analysis between Internet usage and academic achievement yielded a negligible negative correlation (Pearson's  $r = -0.030$ ,  $p = 0.769$ ).

This finding indicates that higher Internet usage does not significantly influence academic performance, supporting the notion that the impact of Internet usage depends on how the Internet is utilized. Educational research has consistently shown that productive Internet use, such as accessing learning resources and participating in educational forums, can enhance academic outcomes, whereas excessive use for non-academic purposes may have the opposite effect.

## 6. IMPLICATIONS

The lack of significant gender differences in Internet usage and academic achievement reflects the democratization of access to educational resources and technology. However, the significant grade-wise difference in Internet usage highlights the need for grade-specific digital literacy programs. Schools should focus on promoting balanced Internet use, ensuring students harness its potential for academic benefit while mitigating its distractions. The weak correlation between Internet usage and academic achievement underscores the importance of cultivating digital competence among students. Educators and parents must guide students to adopt purposeful Internet habits, such as leveraging technology for self-directed learning and academic collaboration.

## 7. CONCLUSION

A substantial body of literature has consistently highlighted a positive and significant relationship between Internet usage and academic achievement among secondary school students. However, the findings of this study do not fully align with this consensus. The data revealed no significant differences between male and female students in terms of their Internet usage and its impact on academic performance, suggesting that gender does not play a defining role in this context. Interestingly, a notable distinction emerged when comparing the students across grades. The results indicate that 9th-grade students tend to use the Internet more frequently than their 10th-grade counterparts do. This disparity in Internet usage patterns points to an inverse relationship between Internet usage and academic achievement, particularly as students advance toward more critical academic years. The reduced Internet usage observed among 10th-grade students could be attributed to increased academic pressure and focus on exam preparation, which in turn correlates with

improved academic outcomes. These findings raise important questions regarding the role of Internet usage in secondary school students' academic lives. While the Internet can serve as a valuable educational tool, its overuse, particularly among younger students, may hinder academic progress. Further research is needed to explore the underlying factors contributing to these trends and determine how Internet usage can be optimized to enhance academic success.

## DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Authors do hereby declare that no generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

## ACKNOWLEDGEMENTS

The authors wish to acknowledge and express gratitude to all scholarly works cited, consulted, and referenced in this study. The insights and contributions of these studies have significantly enhanced our research and deepened our understanding of the subject matter, thereby enriching the academic rigour of this study.

## DATA ACCESS STATEMENT

Research data supporting this publication are available to the corresponding author and can be obtained upon request.

## COMPETING INTERESTS

The authors have declared that no competing interests exist.

## REFERENCES

- Allen, I. E., & Seaman, J. (2013). *Digital learning compass: Distance education enrollment report 2017*. Babson Survey Research Group.
- American Academy of Pediatrics. (2016). Media use in school-aged children and adolescents. *Pediatrics*, 138(5), e20162592.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, D.C.
- Andreassen, C. S., Pallesen, S., & Griffiths, M. D. (2016). The relationship between addictive use of social media and video

- games and symptoms of psychiatric disorders: A longitudinal study. *Psychology of Addictive Behaviors*, 30(2), 252–262.
- Berners-Lee, T. (1995). The World Wide Web: Past, present and future. *International Journal of Human-Computer Studies*, 42(3), 217–222.
- Best, J. W., & Khan, J. V. (1993). *Research in education* (7th ed., p. 247). Prentice Hall India.
- Bhanot, S. (2013). *Basics of educational research methodology*. Manisha Publishers.
- Bureau of Labor Statistics. (2021). Occupational Outlook Handbook. U.S. Department of Labor. Retrieved from <https://www.bls.gov/oooh>
- Castells, M. (2010). *The rise of the network society* (2nd ed.). Wiley-Blackwell.
- Cooper, D. R., Schindler, P. S., & Sharma, J. K. (2012). Measurement scales. In *Business research methods* (8th ed., p. 341). McGraw Hill Education (India).
- Crocker, L., & Wolfe, E. W. (2001). Reliability and validity of scores from a rating scale: An introduction to classical test theory. *Journal of Educational Measurement*, 38(1), 81–92.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268.
- Edward, A. L. (1957). *Techniques of attitude scale construction*. Bajula, Effer & Simons Put. Ltd.
- Furnell, S., & Clarke, N. (2012). Personal security in the Internet age. *Computers & Security*, 31(1), 49–62.
- Garrett, H. E. (1961). *Statistics in psychology and education*. Paragon International Publishers.
- Guilford, J. P., & Fruchter, B. (1973). *Fundamental statistics in psychology and education*. Holt, Rinehart & Winston.
- Harris, D. N. (2011). The role of educational assessment in academic achievement. In D. N. Harris (Ed.), *Assessing student achievement* (pp. 1–14). Routledge.
- Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.
- Hertzog, A. M. (2008). Considerations in determining sample size for pilot studies. *Research in Nursing & Health*, 31(2), 180–191.
- Hill, N. E., & Tyson, D. F. (2009). Parental involvement in middle school: A meta-analytic assessment of the strategies that promote achievement. *Developmental Psychology*, 45(3), 740–763.
- Hillman, C. H., Erickson, K. I., & Kramer, A. F. (2008). Be smart, exercise your heart: Exercise effects on brain and cognition. *Nature Reviews Neuroscience*, 9(1), 58–65.
- Jiang, M. (2015). The influence of Internet usage on students' academic performance: A review of the literature. *Journal of Educational Technology*, 12(4), 45–54.
- Junco, R. (2012). The relationship between frequency of Facebook use, participation in Facebook activities, and student engagement. *Computers & Education*, 58(1), 162–171.
- Kahn, R., & Cerf, V. (1985). Protocols for packet network interconnection. *IEEE Transactions on Communications*, Com-33(5), 537–548.
- Kaur, G. (2018). Internet usage and academic achievement: A study of students in India. *Journal of Educational Research and Reviews*, 6(4), 123–129.
- Khan, M. A. (2017). Internet use and academic performance: A study of undergraduate students. *Educational Research Review*, 12(3), 135–148.
- Koul, L. (2009). *Methodology of educational research*. Vikas Publishing House Pvt. Ltd.
- Kumar, R. (2014). *Research methodology*. SAGE Publications India Pvt. Ltd.
- Laudon, K. C., & Traver, C. G. (2020). *E-commerce 2020: Business, technology, society* (15th ed.). Pearson.
- Leiner, B. M., et al. (2009). A brief history of the Internet. *ACM SIGCOMM Computer Communication Review*, 39(1), 22–31.
- Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2015). Teens, technology, and school. *Pew Research Center*.
- Mossberger, K., Tolbert, C. J., & McNeal, R. S. (2008). *Digital citizenship: The Internet, society, and participation*. MIT Press.
- Nash, D., & Kumer, S. (2018). The impact of cyber security breaches on consumer trust. *International Journal of Information Management*, 39, 206–213.
- Newman, N., Fletcher, R., Levy, D. A. L., & Nielsen, R. K. (2020). *Reuters Institute digital news report 2020*. Reuters Institute for the Study of Journalism.
- Pennycook, G., & Rand, D. G. (2018). Fighting misinformation on social media using crowdsourced judgments of news sources.

- Proceedings of the National Academy of Sciences*, 115(48), 12266–12271.
- Pew Research Center. (2015). *Social media update 2014*. Pew Research Center.
- Robinson, J. P., & Shaver, P. R. (1973). *Measures of social psychological attitudes: Vol. 1. The measurement of psychological characteristics*. University of Michigan.
- Rosen, L. D., Carrier, L. M., & Cheever, N. A. (2013). Facebook and texting made me do it: Media-induced task-switching while studying. *Computers in Human Behavior*, 29(3), 948–958.
- Shaughnessy, J. J., Zechmeister, E. B., & Zechmeister, J. S. (2003). *Research methods in psychology*. Library of Congress Cataloging-in-Publication Data.
- Singh, A. (2005a). Item analysis. In *Test, measurement, and research methods in behavioral science* (p. 47). Bharati Bhavan Publishers.
- Singh, A. (2005b). Test construction. In *Test, measurement, and research methods in behavioral science* (pp. 24–25). Bharati Bhavan Publishers.
- Singh, A. (2005c). Reliability. In *Test, measurement, and research methods in behavioral science* (p. 75). Bharati Bhavan Publishers.
- Smith, A. (2013). *Social media use in 2013*. Pew Research Center.
- Sternberg, R. J. (2003). *Wisdom, intelligence, and creativity synthesized*. Cambridge University Press.
- Turkle, S. (2011). *Alone together: Why we expect more from technology and less from each other*. Basic Books.
- Vasalou, A., Joinson, A. N., Bänziger, T., et al. (2008). Avatars in social media: Balancing accuracy, playfulness and embodied messages. *International Journal of Human-Computer Studies*, 66(11), 1055–1068.
- Wolak, J., Mitchell, K. J., & Finkelhor, D. (2007). Does online pornography increase the risk of sexual offending? *Journal of Adolescent Health*, 41(6), 54–62.
- Young, K. S. (2009). Internet addiction: A review of the literature. *International Journal of Human-Computer Studies*, 65(3), 198–207.
- Zhang, X., & Zhang, M. (2018). The impact of online educational resources on academic achievement: A meta-analysis. *Journal of Educational Research*, 11(2), 123–134.
- Zickuhr, K., & Smith, A. (2013). *Home broadband 2013*. Pew Research Center. Retrieved from <https://www.pewresearch.org>

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of the publisher and/or the editor(s). This publisher and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.

© Copyright (2024): Author(s). The licensee is the journal publisher. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:

<https://www.sdiarticle5.com/review-history/128047>