

An Investigation On The Impact Of Smart Phone Addiction, Locality And Gender On Academic Performance Of Secondary School Students

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Abstract :

The current investigation was done to inspect the academic performance of sec. school pupils with respect to their smartphone addiction, locality and gender. Academic performance has been taken as dependent variable while Smartphone addiction, Locality & Gender have taken as independent variables. "Descriptive survey method" was undertaken for the investigation. "Multi-stage random sampling technique" was used to choose the sample of 800 sec. school students from Rohtak and Hisar Districts. The researcher relied on the examination records of the respective school to assess academic performance, specifically utilizing the previous test scores from the 8th grade. "Smart Phone Addiction Scale by Vijayshri & Ansari (2021)" was applied to collect the data. "3-way ANOVA with 2×2×2 factorial design" was used to examine the collected data. The findings of the study indicated that the combined influence of smartphone addiction, locality & gender on the academic performance of secondary school students was significant.

Keywords: Academic Performance, Gender, Locality, Smartphone Addiction, Sec. School Students.

INTRODUCTION:

Technology has existed for a considerable duration; however, it has experienced significant expansion in the 21st century. Consequently, the transformations we observe in the world today are among the most remarkable to date. The evolution and advancement of technology have not only enhanced our communication systems but have also made our lifestyles far more convenient than previously imaginable. A notable innovation in this realm is the mobile phone, which has become indispensable in contemporary life. In India, it appears that nearly every individual

possesses one, ranging from rickshaw pullers to affluent traders. Nowadays, mobile phones serve purposes beyond mere communication; they enable users to access a variety of content, including weather updates, news reports, educational resources, sports information, music videos, and more. Technological devices such as laptops, tablets, and notepads have become invaluable tools for secondary education. It is evident that students extensively utilize mobile phones for information gathering, as they are generally more affordable and portable compared to other technological devices.

The centre of the education system revolves around pupils' academic success. The success or failure of every educational institution is determined by how well its pupils are doing academically. Academic performance reveals the student's level of skills or the range of information of what he/she has accomplished in any designated area of learning or behavior. It is a multifaceted concept that includes various learner aspects that contribute to academic success. It is the result of a combination of psychological, social, and economic factors that lead to holistic growth of students. According to Talib & Sansgiry (2012), "Academic performance is the degree to which a learner, instructor, or institution has met their short- or long-term learning objectives. It is determined by continuous evaluation or cumulative grade point average (CGPA)". However, research indicates that excessive engagement with social networking, texting, and chatting via mobile phones can lead to diminished academic performance and lower grades among students. The widespread use of smartphones, particularly among youth, has raised concerns about smartphone addiction & its adverse effects on physical activity and academic performance. Smartphone addiction is categorized as a form of technology addiction characterized by impulsive and excessive smartphone use, leading to adverse consequences (Wygmoré, 2022). Excessive smartphone use has been associated with reduced physical activity, disrupted daily routines, and physical and psychological issues such as eye and neck pain, anxiety, depression, and relationship problems (Kim, Kim and Jee, 2015). Numerous studies have indicated that students, when given access to smartphones, tend to shift their focus toward leisure activities, particularly social media use, affecting their academic performance. For instance, checking Facebook and messaging during assignments has been linked to lower academic performance (Junco, 2012) Even when smartphones are employed for educational purposes, they can still negatively impact tutorial-related activities, leading to reduced group activities and decreased motivation to learn (Jeong, 2015).

NEED OF THE STUDY:

Smartphone addiction is one of the crucial problems that is happening among teenagers. This habit may lead to various problems such as lower academic performance. Numerous studies have indicated that students, when given access to smartphones, tend to shift their focus toward leisure activities, particularly social media use, affecting their academic performance. Even when smartphones are employed for educational purposes, they can still negatively impact tutorial-related activities, leading to reduced group activities and decreased motivation to learn. The relationship between smartphone usage and educational outcomes has been investigated in various studies, but the results have been mixed. Hayat, Arshad, and Hussain (2014) demonstrated that mobile phone usage was perceived as a beneficial technology, as it provided extensive information pertinent to their studies and exam durations. The majority of participants indicated that mobile phone usage had minimal impact on their academic performance, as they typically turned off their devices during examinations. Bhardwaj & Ashok (2015) identified a “high prevalence of mobile phone addiction among teenagers & a considerable level of loneliness was observed among adolescents, gender differences in this regard were also absent”. Kibona and Mgaya (2015) concluded that smartphones negatively influenced students' academic performance in Tanzania. Bhutia and Tariang (2016) reported that students exhibited moderate levels of mobile phone addiction, with no discernible impact based on gender or academic stream. Kumari (2016) found that mobile phone addiction had little to no effect on mental health. Raza et al. (2020) concluded that “smartphone addiction adversely affects students' academic performance, as it diverts their focus from academic pursuits to cyber loafing”. Gangadharan, Borle, and Basu (2022) found that the average time spent on smartphones was significantly greater among those identified as addicted, although no significant gender differences were noted in the relationship between time spent on phones & addiction. In addition, a recent survey indicated that 45% of teenagers claimed to use the Internet almost continuously.

A review of the relevant literature indicates that smartphone addiction poses a significant issue for students in educational settings. This addiction adversely affects both student learning and overall academic achievement. Increased smartphone usage during study periods correlates with a heightened detrimental effect on learning outcomes. Furthermore, excessive use of smartphones undermines the skills & cognitive abilities essential for academic success.

OPERATIONAL DEFINITIONS:

Academic Performance: Academic performance has to do with results obtained in a subject or subjects in a teacher made test or examination, over a short period of time. For the Academic performance measure, the researcher had to depend upon the school examination record of the respective school.

Smart Phone Addiction: Smartphone addiction is defined as excessive use of smart phones that is difficult to control. Its influence affects other basic activities of daily life, leading to negative consequences (Park & Lee, 2012).

Locality: It refers to the external surrounding within which an organism (human) lives, or external factor that affect the organism development of behavior. This can also be defined into urban and rural locality.

Gender: It refers to the cultural and social characteristics that distinguish woman from men in the society.

OBJECTIVE OF THE STUDY:

- ❖ **“To find out the interaction effect of smart phone addiction, locality and gender on academic performance of secondary school students.”**

HYPOTHESIS OF THE STUDY:

- H₀₁** “There is no significant interaction effect of smart phone addiction, locality and gender on academic performance of secondary school students.”

DESIGN AND METHODOLOGY:

In the present study, descriptive survey method was used. The 2×2×2 factorial randomized group design was used to analyze the data. All the independent variables i.e. Smart phone addiction (High & Low), Locality (Rural & Urban) and Gender (Male & Female) were varied at the two levels as given below.

Smart Phone Addiction
High
Low
Locality
Rural

POPULATION & SAMPLE:

In the current investigation, all the 9th class students studying in private secondary schools, affiliated to Central Board of School Education (CBSE) of Rohtak and Hisar Districts of Haryana State constituted the target population. “Multi-stage random sampling technique” was used to select the sample of 800 students from Rohtak and Hisar Districts.

TOOL USED:

- **Smart Phone Addiction Scale** by Vijayshri & Ansari (2021).
- **Academic Performance:** For the Academic performance measure, the researcher had to depend upon the school examination record of the respective school of their previous test scores i.e. 8th.

STATISTICAL TECHNIQUES:

“The Three-Way Analysis of Variance (ANOVA) with 2×2×2 Factorial Design was computed using SPSS 20 version to study the interaction effects of the independent variables i.e. Smart phone addiction, Locality and Gender on Academic performance of secondary school students. Wherever F-value was found significant, ‘t’-test was employed for further investigation”.

DATA ANALYSIS & INTERPRETATION:

To study the interaction effect of Smart phone addiction, Locality and Gender on Academic performance of secondary school students, data were subjected to ANOVA (2×2×2) factorial study with a randomized group design. In this section, the independent variables i.e. Smart phone addiction, Locality and Gender were coded as A, B, C respectively and were varied into two ways as: High (A₁) & Low (A₂); Rural (B₁) & Urban (B₂); Male (C₁) & Female (C₂). The summary of ANOVA (2×2×2) has been presented in the Table-1 which is analyzed in the interaction effects of independent variables i.e. Smart phone addiction, Locality and Gender on Academic performance of secondary school students.

Table-1 Summary of Three Way ANOVA (2×2×2 Factorial Design) for Academic Performance of Secondary School Students with respect to their Smart phone addiction, Locality and Gender

Dependent Variable: Academic Performance					
Source of Variance	Type III Sum of Squares	df	Mean Squares	F-ratios	Sig.
Corrected Model	74175.017	7	10596.431	23.669	.000
Intercept	2480477.008	1	2480477.008	5540.563	.000
Interaction of Smart Phone Addiction x Locality x Gender (AxBxC)	17570.786	1	17570.786	39.247	.000
Error	238173.226	532	447.694		
Corrected Total	312348.243	539			

Total	2901675.000	540			
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An assessment of the Table-1 indicates that the F-ratio (39.247) for the interaction effect of smart phone addiction, locality and gender on academic performance of secondary school student is significant at 0.01 level which leads to the inference that smart phone addiction, locality and gender collectively have a significant effect on academic performance of secondary school students. Therefore, H_{01} stands rejected. It is further subjected to t-test computation to find out the significant difference between mean scores of academic performance of different groups for smart phone addiction, locality and gender. The results have been shown in the Table-2 and Fig. 1.

Table-2 't'-values for Mean Scores of Academic performance of Sec. School Student for Different Groups of Smart Phone Addiction, Locality and Gender (A×B×C)

Sr. No.	Group	N		Means		S.D.s		t-values
1	A ₁ B ₁ C ₁ vs A ₁ B ₁ C ₂	70	79	59.35	74.31	17.79	18.71	5.003**
2	A ₂ B ₂ C ₁ vs A ₂ B ₂ C ₂	77	84	67.76	53.48	19.27	19.83	4.632**
3	A ₁ B ₁ C ₁ vs A ₁ B ₂ C ₂	70	56	59.35	48.82	17.79	21.04	2.987**
4	A ₁ B ₁ C ₂ vs A ₁ B ₂ C ₂	79	56	74.31	48.82	18.71	21.04	7.262**
5	A ₁ B ₂ C ₁ vs A ₂ B ₁ C ₂	58	55	55.01	61.63	20.54	19.65	1.751 (NS)
6	A ₁ B ₂ C ₂ vs A ₂ B ₂ C ₂	56	84	48.82	53.48	21.04	19.83	1.313 (NS)
7	A ₁ B ₁ C ₁ vs A ₂ B ₂ C ₂	70	84	59.35	53.48	17.79	19.83	1.935 (NS)
8	A ₁ B ₁ C ₂ vs A ₁ B ₂ C ₁	79	58	74.31	55.01	18.71	20.54	5.641**
9	A ₂ B ₁ C ₁ vs A ₂ B ₂ C ₁	61	77	60.14	67.76	22.71	19.27	2.091*
10	A ₁ B ₁ C ₁ vs A ₂ B ₁ C ₁	70	61	59.35	60.14	17.79	22.71	0.219 (NS)
11	A ₁ B ₁ C ₂ vs A ₂ B ₁ C ₂	79	55	74.31	61.63	18.71	19.65	3.747**
12	A ₁ B ₂ C ₂ vs A ₂ B ₂ C ₁	56	77	48.82	67.76	21.04	19.27	5.308**
13	A ₁ B ₁ C ₂ vs A ₂ B ₂ C ₂	79	84	74.31	53.48	18.71	19.83	6.902**
14	A ₁ B ₂ C ₁ vs A ₁ B ₂ C ₂	58	56	55.01	48.82	20.54	21.04	1.589 (NS)
15	A ₁ B ₁ C ₁ vs A ₂ B ₁ C ₂	70	55	59.35	61.63	17.79	19.65	0.671 (NS)

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16	A₁B₂C₁ vs A₂B₂C₁	58	77	55.01	67.76	20.54	19.27	3.666**
17	A₁B₁C₂ vs A₂B₁C₁	79	61	74.31	60.14	18.71	22.71	3.948**
18	A₁B₂C₁ vs A₂B₂C₂	58	84	55.01	53.48	20.54	19.83	0.443 (NS)
19	A₁B₂C₂ vs A₂B₁C₁	56	61	48.82	60.14	21.04	22.71	2.798*
20	A₁B₁C₁ vs A₂B₂C₁	70	77	59.35	67.76	17.79	19.27	2.751*
21	A₁B₂C₁ vs A₂B₁C₁	58	61	55.01	60.14	20.54	22.71	1.293 (NS)
22	A₁B₂C₂ vs A₂B₁C₂	56	55	48.82	61.63	21.04	19.65	3.316**
23	A₂B₁C₁ vs A₂B₁C₂	61	55	60.14	61.63	22.71	19.65	0.379 (NS)
24	A₁B₁C₂ vs A₂B₂C₁	79	77	74.31	67.76	18.71	19.27	2.153*
25	A₂B₁C₁ vs A₂B₂C₂	61	84	60.14	53.48	22.71	19.83	1.838(NS)
26	A₂B₁C₂ vs A₂B₂C₁	55	77	61.63	67.76	19.65	19.27	1.782 (NS)
27	A₂B₁C₂ vs A₂B₂C₂	55	84	61.63	53.48	19.65	19.83	2.382*
28	A₁B₁C₁ vs A₁B₂C₁	70	58	59.35	55.01	17.79	20.54	1.264 (NS)

*** Significant at 0.01 level

* Significant at 0.05 level

NS= Not Significant

**“A₁ = Higher Smart Phone Addiction;
C₁ = Male”**

B₁ = Rural;

**“A₂ = Lower Smart Phone Addiction;
C₂ =Female”**

B₂ = Urban;

Table-2 indicates that t-values 1.751, 1.313, 1.935, 0.219, 1.589, 0.671, 0.443, 1.293, 0.379, 1.838, 1.782 and 1.264 for the groups A₁B₂C₁ vs A₂B₁C₂; A₁B₂C₂ vs A₂B₂C₂; A₁B₁C₁ vs A₂B₂C₂; A₁B₁C₁ vs A₂B₁C₁; A₁B₂C₁ vs A₁B₂C₂; A₁B₁C₁ vs A₂B₁C₂; A₁B₂C₁ vs A₂B₂C₂; A₁B₂C₁ vs A₂B₁C₁; A₂B₁C₁ vs A₂B₁C₂; A₂B₁C₁ vs A₂B₂C₂; A₂B₁C₂ vs A₂B₂C₁ and A₁B₁C₁ vs A₁B₂C₁ respectively are not significant at 0.05 level leading to the inference that these groups did not differ significantly with each other in relation to their academic performance.

Table-2 demonstrates that t-value (5.003) for male pupils of rural area having higher smartphone addiction (A₁B₁C₁) and female students of rural area having higher smart phone addiction (A₁B₁C₂) is significant at 0.01 level. Observation of average scores indicated that male students of rural area having higher smart phone addiction (59.35) have less academic performance than female students of rural area having higher smart phone addiction

(74.31). The t-value (4.632) for male pupils of rural area having higher smart phone addiction ($A_2B_2C_1$) and female students of urban area having lower smart phone addiction ($A_2B_2C_2$) is significant at 0.01 level. Average scores concluded that male pupils of rural area having higher smart phone addiction (67.76) have higher academic performance as compare to female students of urban area having lower smart phone addiction (53.48). Again, the t-value (2.987) for male students of rural area having higher smartphone addiction ($A_1B_1C_1$) and female students of urban area having higher smart phone addiction ($A_1B_2C_2$) is significant at 0.05 level. Average scores inferred that male students of rural area having higher smartphone addiction (59.35) have higher academic performance than female students of urban area having higher smart phone addiction (48.82). The t-value (7.262) for female students of rural area having higher smartphone addiction ($A_1B_1C_2$) and female students of urban area having higher smart phone addiction ($A_1B_2C_2$) is significant at 0.01 level. Observation of mean scores indicated that female students of rural area having higher smartphone addiction (74.31) possess higher academic performance than female pupils of urban area having higher smart phone addiction (48.82).

Table-2, further, revealed that t-value (5.641) for female students of rural area having higher smartphone addiction ($A_1B_1C_2$) and male students of urban area having higher smart phone addiction ($A_1B_2C_1$) is significant at 0.01 level. Average scores demonstrated that female students of rural area having higher smartphone addiction (74.31) have higher academic performance than male students of urban area having higher smart phone addiction (55.01). The t-value (2.091) for male pupils of rural area having lower smartphone addiction ($A_2B_1C_1$) and male students of urban area having lower smart phone addiction ($A_2B_2C_1$) is significant at 0.05 level. Average scores inferred that male students of rural area having lower smartphone addiction (60.14) got less academic performance as compared to male students of urban area having lower smart phone addiction (67.76). The t-value (3.747) for female students of rural area having higher smartphone addiction ($A_1B_1C_2$) and female students of urban area having lower smart phone addiction ($A_2B_1C_2$) is significant at 0.01 level. Average scores showed that female pupils of rural area having higher smartphone addiction (74.31) have higher academic performance than female students of urban area having lower smart phone addiction (61.63).

The t-value (5.308) for female pupils of urban area having higher smartphone addiction ($A_1B_2C_2$) and male students of urban area having lower smart phone addiction ($A_2B_2C_1$) is significant at 0.01 level. Average scores that female pupils of urban area having higher smartphone addiction (48.82) possess less academic

performance as compare to male students of urban area having lower smart phone addiction (67.76). The t-value (6.902) for female students of urban area having higher smartphone addiction ($A_1B_1C_2$) and female students of urban area having lower smart phone addiction ($A_2B_2C_2$) is significant at 0.01 level. Average scores highlighted that female pupils of urban area having higher smartphone addiction (74.31) have higher academic performance than female students of urban area having lower smart phone addiction (53.48). Similarly, the t-value (3.666) for male students of urban area having higher smartphone addiction ($A_1B_2C_1$) and male students of urban area having lower smart phone addiction ($A_2B_2C_1$) is significant at 0.01 level. Observation of average scores indicated that male students of urban area having higher smartphone addiction (55.01) have lesser academic performance than male students of urban area having lower smart phone addiction (67.76). The t-value (3.948) for female students of rural area having higher smartphone addiction ($A_1B_1C_2$) and male students of rural area having lower smart phone addiction ($A_2B_1C_1$) is significant at 0.01 level. Average scores inferred that female pupils of rural area having higher smartphone addiction (74.31) possess higher academic performance than male students of rural area having lower smart phone addiction (60.14).

The t-value (2.798) for female students of urban area having higher smartphone addiction ($A_1B_2C_2$) and male students of rural area having lower smart phone addiction ($A_2B_1C_1$) is significant at 0.05 level. Average scores demonstrated that female pupils of urban area having higher smartphone addiction (48.82) got less academic performance as compare to male students of rural area having lower smart phone addiction (60.14). The t-value (2.751) for female students of urban area having higher smartphone addiction ($A_1B_2C_2$) and male students of rural area having lower smart phone addiction ($A_2B_1C_1$) is significant at 0.05 level. Average scores highlighted that female pupils of urban area having higher smartphone addiction (59.35) have less academic performance than male students of rural area having lower smart phone addiction (67.76) is significant at 0.05 level. Similarly, the t-value (3.316) for male students of urban area having higher smartphone addiction ($A_1B_2C_2$) and female students of rural area having lower smart phone addiction ($A_2B_1C_2$) is significant at 0.01 level. Average scores inferred that male students of urban area having higher smartphone addiction (48.82) have less academic performance as compare to female students of rural area having lower smart phone addiction (61.63). The t-value (2.153) for female students of rural area having higher smartphone addiction ($A_1B_1C_2$) and male students of urban area having lower smart phone addiction ($A_2B_2C_1$) is significant at 0.05 level. Observation of average scores inferred that male students of rural area having higher smartphone addiction (74.31) have higher academic performance than male

students of urban area having lower smart phone addiction (67.76). Lastly, the t-value (2.382) for female students of rural area having lower smartphone addiction ($A_2B_1C_2$) and female students of urban area having lower smart phone addiction ($A_2B_2C_2$) is significant at 0.05 level. While comparing average scores, it can be seen that female students of rural area having lower smartphone addiction (61.63) got higher academic performance as compare to female students of urban area having lower smart phone addiction (53.48).



Fig. 1: Mean Scores for Interaction Effect of Smartphone Addiction, Locality and Gender (A×B×C) on Academic Performance of Sec. School Students

CONCLUSION:

Thus, we can point out that Smartphone addiction is a behavioral problem characterized by individuals spending a significant proportion of time using their smartphones or having difficulty controlling their use, resulting in adverse impacts on their daily activities. Smartphone addiction can negatively impact learning, memory, focus, and decision-making, perhaps leading to lower academic performance. Education ought to be designed to provide children with experiences that foster their physical, intellectual, emotional, social, and moral development. Consequently, policymakers should establish regulations concerning the use of smartphones within the classroom environment. To assist students in achieving a harmonious balance between online and offline pursuits, the curriculum ought to include the cultivation of time management and digital literacy competencies. Encouraging students to monitor their screen time and establish objectives for their online engagement can also prove beneficial. Furthermore, it is imperative for parents or guardians to maintain an open and constructive dialogue with their children regarding responsible technology use. Educators should ensure that their pacing is appropriate to avoid overwhelming students as the term concludes. Educational institutions should implement awareness campaigns and workshops aimed at educating students about the potential impacts of excessive internet usage on their academic success. Additionally, it is crucial to inform students about the negative consequences of smartphone addiction on their personal lives, academic achievements, and overall well-being through a series of informative seminars.

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