

**Comparative Study**

## **A Comparative Study on the Effect of Digital Addiction on Teens**

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### **ABSTRACT**

This study investigates the impact of digital addiction on mental imagery, curiosity, and aggression levels among students in ICSE and State board schools. The sample comprised 1200 students aged 12-15 years from different schools in Ahmedabad, selected using random sampling. The independent variables were internet addiction level, gender, and board of education, while the dependent variables were aggression, curiosity, and mental imagery scores. Various tools, including the Aggression Scale, Mental Imagery Questionnaire, Children's Curiosity Scale, and Internet Addiction Test, were utilized to collect data. Mean, standard deviation, and three-way ANOVA were employed for data analysis. The results revealed a significant interaction effect among school board type, gender, and internet addiction level concerning aggression scale and specific sub-scales of mental imagery. However, no significant interaction effect was observed for curiosity scale and one sub-scale of mental imagery. This study sheds light on the causes of digital addiction and provides valuable insights for policymakers to develop interventions and strategies addressing its consequences.

**Keywords:** *Curiosity, Mental Imagery, Digital Addiction, Teenagers, Aggression*

When we were growing up, the closest thing we had to the internet and computer was the cybercafe or school lab. Tin cans or paper cups tied with long string or rope was something each one of us has made and used as phone. We also had walkie talkies. The television programmes were limited as we had 2-3 channels to choose from. And yes, Digital Addiction did not even exist. Our life was full of mud, toys, books, laughter, adventure everything that was a reality.

But the Millennial Generation have a quite different childhood experience. The explosion of technology in recent decades has been significant and this has impacted young children considerably. For example, regular and normal toys meant for children and teenagers have been taken over by electronic toys and gadgets. Books which are our best friend has been replaced by e-readers, the age old board games have been replaced by gaming apps, to the extent even normal pets have been replaced with apps and robotic with artificial intelligence which claims to be just like the real thing but in reality it's only a World of Fantasy.

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### *Smartphone Addiction Statistics*

- On an average smartphone owner unlocks their phone around 150 times in a day.
- Using smartphones for longer intervals of time changes brain chemistry.
- Quite a few of the people shows signs of nomophobia.
- Few people sleep with or next to their mobile phone.
- Smartphone use and depression are correlated.
- Some people would rather go without shoes for a week than take a break from their phone.

### *Significance of the Study*

#### **Growing up in the Digital Age: Time to Re-Imagine**

#### **Mobile- Internet -Screens – Digital Platform**

Life without technology- can our youngsters imagine a life without the technology even for a second? The answer is a big NO. It is one of the most dangerous and dreadful dream our children have today. Technology was supposed to be our assistant to help us with our day-to-day work to remove all roadblocks to make our lives easy. But today the same technology development has become our biggest roadblock in the form of Digital Addiction.

**Flashback** – few years back when we were young, we spent our time in active, imaginative, creative and in various outdoor play time. Some of us even would have rough housed with friends, engaged with nature and built colourful worlds from sheer imagination. The word ‘BORED’ was never a part of our daily lives.

**Present Time** – Today's generation is different. Their life starts with technology and ends with it. The 21<sup>st</sup> century childhood is different. The current trends are alarming as well as dangerous as still we do not know the effect Digital Addiction will leave behind. As it is seen in the study conducted by 2010 Kaiser Foundation where it was found that the average elementary school aged child spent 7.5 hours daily using entertainment technology, and more than 70 percent of these children had a television in their bedrooms.

The use of technology is only increasing with each passing day. New forms and ways of digital technology, usage, entertainment is introduced regularly. With so many digital platforms available today people are getting stuck in the tsunami of screens. Even children are getting effected. There are a huge number of young children who are battling a digital addiction.

Young children now a days gets exposed to electronics and digital media at incredibly young age. They are spending a lot of their time in front of the glowing screen instead of playing outside or interacting with their peers. It was researched and Dr. Nicholas Kardaras feels that digital addiction is as potent or serious as Heroin Addiction.

Technology now a days has got its tight grip on our lives, and the dangerous result is that we are losing our human connection and communication – our voices, touch and facial expressions. Google is not helping but our true knowledge is getting replaced by digital knowledge. Our natural imagination power is getting replaced by stored or guided imagination. In short, our natural characteristics like curiosity and mental imagination is getting killed in the bargain. Too much of digital time and lessen or no physical time is giving rise to aggressive behaviour in young children.

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As the debate and research continues one thing that is coming out strong is that Digital Addiction is a reality. This necessitates serious probe into the causes that underlie and factors that lead to Digital Addiction, so that as a responsible citizen we can devise means to grapple with this enormous problem.

In the present study, I am trying to identify whether Digital Addiction has any effect on Mental Imagination, Curiosity and Aggression level on teens of state and ICSE board school. Hence this study on “A Comparative Study of the effect of Digital Addiction on Aggression, Curiosity and Mental Imagination level of Teens of State and ICSE board.”

They also get confused in their mind and cannot take right decision in their life. Hence, research in this area is very much needed to identify the mental health problems of adolescent students who use new media.

### **METHODOLOGY**

#### *Objectives of the Study*

##### **Aggression Scale**

1. To study and compare Aggression level between ICSE board and State board students with regard to Aggression Scale.
2. To study and compare Aggression level between Girls (Female) students and Boy (Male) students with regard to Aggression Scale.
3. To study and compare Aggression level between Internet/Digital Addiction level of students with regard to Aggression Scale.
4. To study interaction effect between school board and gender of students with regard to Aggression Scale.
5. To study interaction effect between school board and Internet/Digital addiction level of students with regard to Aggression Scale.
6. To study interaction effect between gender and Internet/Digital addiction level of students with regard to Aggression Scale.
7. To study interaction effect between school board, gender and Internet/digital addiction level of students with regard to Aggression Scale.

**Note:** The same methodology was followed for the Children's Curiosity Scale and Mental Imagery Questionnaire in determining objectives

#### *Hypothesis of the Study*

##### **Aggression Scale**

1. There is no significant difference between ICSE board and State board students with regard to Aggression Scale.
2. There is no significant difference between Girls (Female) students and Boy (Male) students with regard to Aggression Scale.
3. There is no significant difference between Internet/Digital Addiction level of students with regard to Aggression Scale.
4. There is no significant difference between school board and gender of students with regard to Aggression Scale.
5. There is no significant difference between school board and Internet/digital addiction level of students with regard to Aggression Scale.
6. There is no significant difference between gender and internet/digital addiction level of students with regard to Aggression Scale.

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7. There is no significant difference between school board, gender and internet/digital addiction level of students with regard to Aggression Scale.

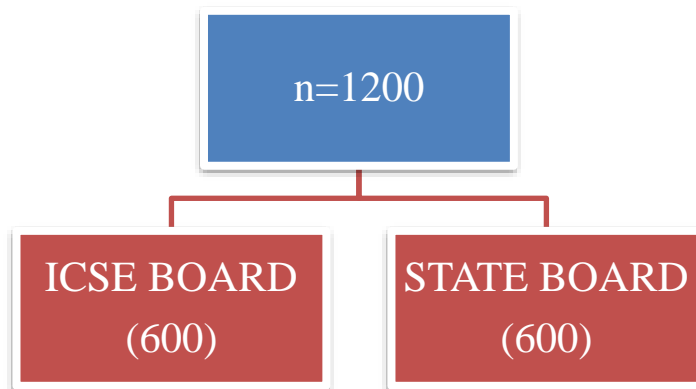
**Note:** The same methodology was followed for the Children's Curiosity Scale and Mental Imagery Questionnaire in determining hypothesis.

### Sample

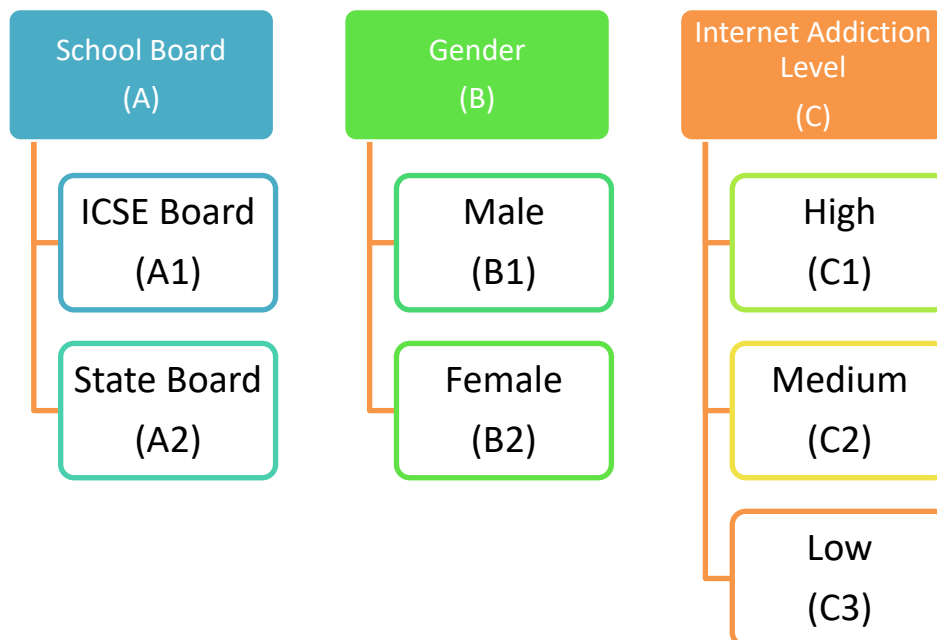
The sample for the present study was selected from Ahmedabad City in the state of Gujrat. Ahmedabad city was selected purposively as it was convenient to the researcher and need of the study.

The total sample for the research comprised of 1200 students between the age group of 12-15 years studying in different ICSE and State board schools of Ahmedabad. For the study 4 schools were randomly selected from Ahmedabad city. 2 ICSE board school and 2 State Board School.

The sample was selected by random method of sampling. The sample was categorized as under:



**Fig 1: Sample Size**



**Fig 2: Design of the Study**

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**Table 1: 2\*2\*3 Factorial Design**

Digital Level Addiction	A1 ICSE Board		A2 State Board		Total
	Male (Age 12-15) B1	Female (Age 12-15) B2	Male (Age 12-15) B1	Female (Age 12-15) B2	
	High (C1)	100	100	100	
Medium(C2)	100	100	100	100	400
Low(C3)	100	100	100	100	400
<b>Total</b>	<b>300</b>	<b>300</b>	<b>300</b>	<b>300</b>	<b>1200</b>

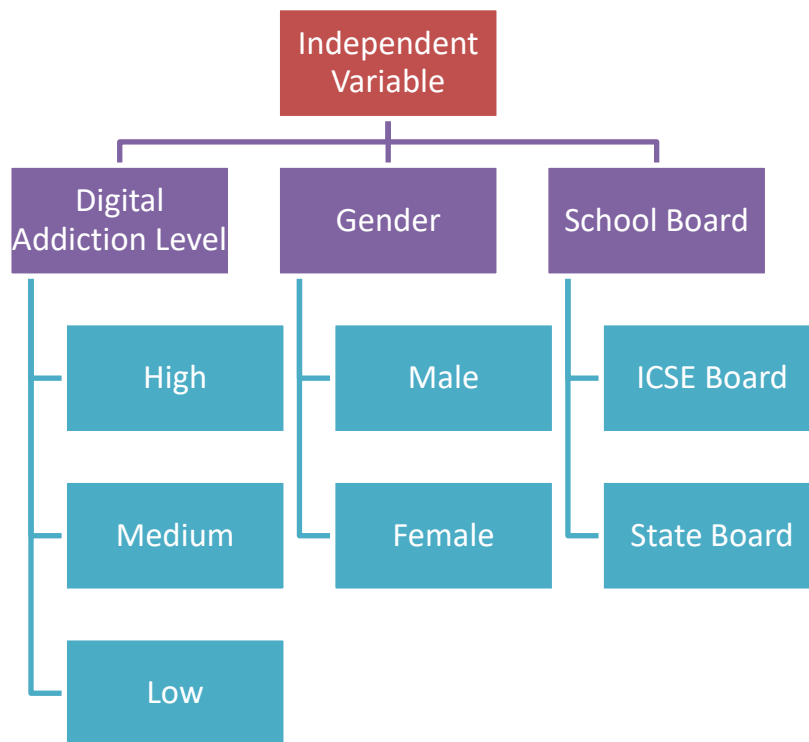
### Variables

Anything that has quantity or quality, and which varies is called Variables. For the present study, following variables were selected.

### Independent Variables:

The variable which the researcher changes or control and has direct effect on the dependent variable is called Independent Variables. For the present study following Independent Variables were used:

1. **Digital Addiction Level**  
High – Medium - Low
2. **Gender**  
Male (Boys) – Female (Girls)
3. **Board of Education**  
ICSE Board – State Board



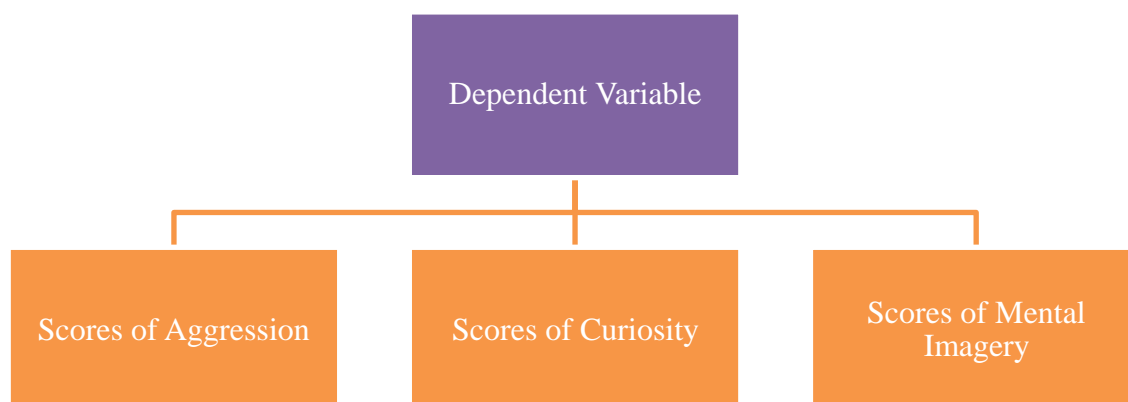
**Fig 3: Independent Variables**

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### **Dependent Variables:**

Variables that are affected by the independent variables are Dependent Variables. Following Dependent Variables were used for the present study:

1. Scores of Aggression Scale
2. Scores of Children's Curiosity Scale
3. Scores of Mental Imagery Questionnaire



**Fig 4: Dependent Variables**

**Table 2: Variable Table – Independent & Dependent Variable**

SN.	Variables	Variable Level	No. of Variables	Name of Variables
1.	Digital Addiction Level	Independent Variables	3	1. High 2. Medium 3. Low
2.	Gender	Independent Variables	2	1. Girls (Female) 2. Boys (Male)
3.	Board of Education	Independent Variables	2	1. State Board 2. ICSE Board.
4.	Scores of Aggression Scale	Dependent Variables	5	1. Very High or Saturated 2. High 3. Average 4. Low 5. Very Low
5	Scores of Curiosity Scale	Dependent Variables	7	1. Extremely high Curiosity 2. High Curiosity 3. Above Avg Curiosity 4. Avg/Moderate Curiosity 5. Below Avg Curiosity 6. Low Curiosity 7. Extremely Low Curiosity
6	Scores of Mental Imagery Questionnaire	Dependent Variables	6	1. Very Clear Image 2. Fairly Clear Image 3. Just Clear Image 4. Somewhat Clear Image 5. Dim Image 6. No Image

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### *Tools for Data Collection*

In the present research study following tools was used for data collection:

**Table 3: List of Tools**

SN.	Study Aspect	Scale & Test	Developed By
1	Internet Addiction Level	Internet Addiction Test (IAT)	Dr. Kimberly Young
2	Level of Aggression	Aggression Scale (AG)	Dr. R.L Bharadwaj
3	Level of Curiosity	Children's Curiosity Scale (CCS-K)	Dr. Rajiv Kumar
4	Level of Mental Imagery	Mental Imagery Questionnaire (MIQ-R)	P M. Rajamanickam

### *Statistical Analysis*

Statistical data analysis is the culmination of the long process of hypotheses formation, tools construction and data collection. For the present study Gender, Board of Education, Internet Addiction level scores, Scores of Aggression scale, Scores of Children's Curiosity and Scores of Mental Imagery Questionnaire administered on sample students were coded and entered in excel sheet. The coded data collected were then analysed by computing Mean and SD.

Tables and graphs were made to determine level of digital addiction on aggression, curiosity, and mental imagination level in teens of state and ICSE board. Finally, the 3-way Anova (Analysis of Variance) was used to determine whether there is a three-way interaction between scores of curiosity, aggression and mental imagination of teen female and male students of State and ICSE board school.

According to the objectives of the present research study and in order to find out the effects of Digital Addiction (all level of Internet Addiction – High, Medium, and low) on Aggression level, Curiosity level and mental imagination level (all 6 sub scales) of ICSE and State Board school students, and to verify the interaction effect between the variables 3-way Anova (Analysis of Variance) was computed.

## **RESULT AND DISCUSSION**

**Ho1 There will be no significant interaction effect between type of school board, gender, and addiction level of school students with regard to Aggression Scale.**

**Table 4: Showing Mean scores of Aggression Scale of Variable – A \* B \* C (School Board \* Gender \* Internet Addiction Level) of teens**

Board		ICSE (A1)		State (A2)	
IAT Level	Mean	Male (B1)	Female (B2)	Male (B1)	Female (B2)
High (C1)	Mean	62.39	34.73	58.91	44.92
Medium (C2)	Mean	62.17	31.92	72.27	21.58
Low (C3)	Mean	33.31	18.21	30.31	49.86
N		300	300	300	300

The f ratio on Aggression Scale of Variable A – Type of school board, Variable B – Gender of school students and Variable C – Internet Addiction Level which is 14.14 and is significant at 0.01 level. So, “There is no significant interaction effect between type of school board, gender and internet addiction level of students with regard to Aggression Scale”, is rejected.

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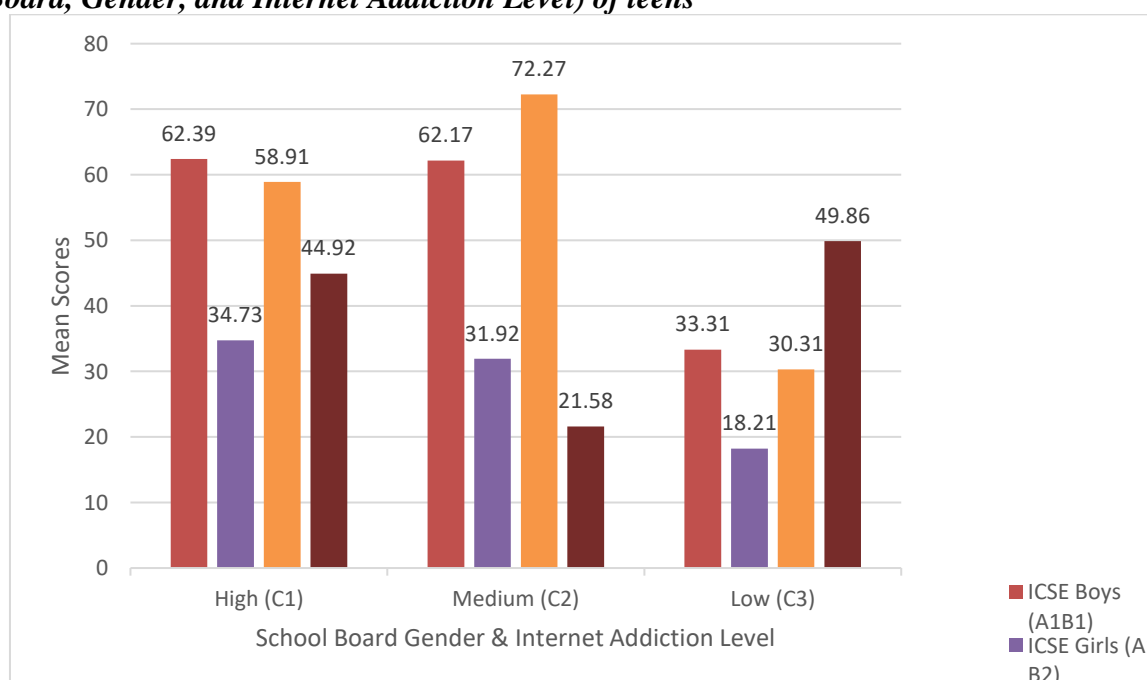
That means variable A\*B\*C is significantly contributing to the Aggression scale. The hypothesis was formulated to know whether there is a influence of aggression on school boards, students gender and internet addiction level of school students. The F value obtained indicated that the hypothesis is rejected.

Table no.4 shows mean scores of ICSE board male (boys) having high internet addiction level is 62.39, the mean scores of ICSE board male (boys) having medium internet addiction level is 62.17 and the mean scores of ICSE board male (boys) having low internet addiction level is 33.31. The mean scores of ICSE board female (girls) having high internet addiction level are 34.73, the mean scores of ICSE board female (girls) having medium internet addiction level are 31.92 and the mean scores of ICSE board female (girls) having low internet addiction level is 18.21.

The mean scores of State board male (boys) having high internet addiction level are 58.91, the mean scores of State board male (boys) having medium internet addiction level are 72.27 and the mean scores of State board male (boys) having low internet addiction level is 30.31. The mean scores of State board female (girls) having high internet addiction level are 44.92, the mean scores of State board female (girls) having medium internet addiction level are 21.58 and the mean scores of State board female (girls) having low internet addiction level is 49.86.

It means significant interaction effect does exist between type of school board, gender, and internet addiction level of school students. In the current research study it was found that females of state board showed high aggression as compared to ICSE board females having high internet addiction even though no further reasons was found. Similarly male from ICSE board showed slightly high aggression as compared to State Board males with high internet addiction level.

**Fig No:5 Chart Showing Mean scores of Aggression Scale of Variable – A\*B\*C (School Board, Gender, and Internet Addiction Level) of teens**





**Ho2 There is no significant interaction effect between school boards, gender, and addiction level of students with regard Children’s Curiosity.**

**Table 5: Showing Mean scores of Children’s Curiosity Scale of Variable – A \* B \* C (School Board \* Gender \* Internet Addiction Level) of teens**

Board		ICSE (A1)		State (A2)	
IAT Level	Mean	Male (B1)	Female (B2)	Male (B1)	Female (B2)
High (C1)	Mean	141.37	72.04	131.33	68.57
Medium (C2)	Mean	142.63	86.53	138.48	86.71
Low (C3)	Mean	84.34	91.32	75.53	90.86
N		300	300	300	300

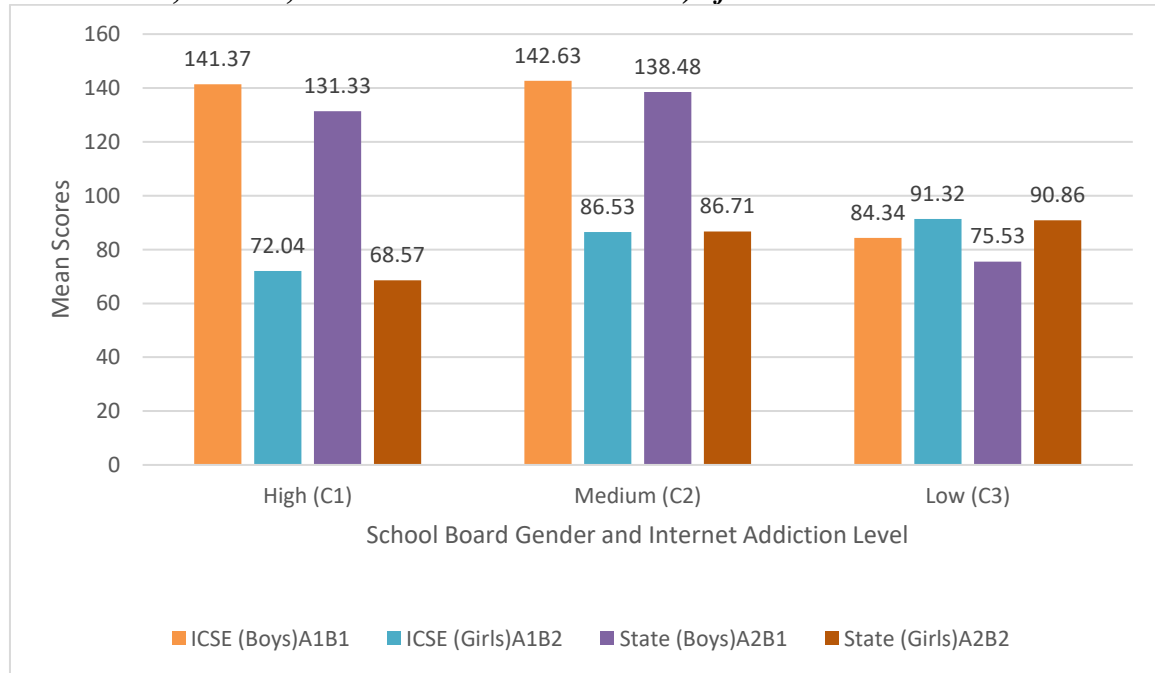
The f ratio on Children’s Curiosity Scale of Variable A – Type of school board, Variable B – Gender of school students and Variable C – Internet Addiction Level which is 0.59 and is not significant. So, “There is no significant interaction effect between type of school board, gender and internet addiction level of students with regard to Children’s Curiosity Scale”, is accepted. That means variable A\*B\*C is significantly not contributing to the Children’s Curiosity scale. The hypothesis was formulated to know whether there is a influence of curiosity on school boards, students gender and internet addiction level of school students. The F value obtained indicated that the hypothesis was accepted.

Table no.5 shows mean scores of ICSE board male (boys) having high internet addiction level is 141.37, the mean scores of ICSE board male (boys) having medium internet addiction level is 142.63 and the mean scores of ICSE board male (boys) having low internet addiction level is 84.34. The mean scores of ICSE board female (girls) having high internet addiction level are 72.04, the mean scores of ICSE board female (girls) having medium internet addiction level are 86.53 and the mean scores of ICSE board female (girls) having low internet addiction level is 91.32.

The mean scores of State board male (boys) having high internet addiction level are 131.33, the mean scores of State board male (boys) having medium internet addiction level are 138.48 and the mean scores of State board male (boys) having low internet addiction level is 75.53. The mean scores of State board female (girls) having high internet addiction level are 68.57, the mean scores of State board female (girls) having medium internet addiction level are 86.71 and the mean scores of State board female (girls) having low internet addiction level is 90.86. It means significant interaction effect does not exist between type of school board, gender and internet addiction level of school students.

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**Fig No.:6 Chart Showing Mean scores of Children’s Curiosity Scale of Variable – A\*B\*C (School Board, Gender, and Internet Addiction Level) of teens**



**Ho3 There is no significant interaction effect between school boards, gender, and internet addiction level of students with regard to Mental Imagery sub scale B – Auditory Images**

**Table No: 6 Showing Mean scores of Mental Imagery sub scale, B – Auditory Images of Variable – A \* B \* C (School Board \* Gender \* Internet Addiction Level) of teens**

Board	Mean/SD	ICSE (A1)		State (A2)	
		Male (B1)	Female (B2)	Male (B1)	Female (B2)
High (C1)	Mean	26.91	18.61	25.94	19.17
Medium (C2)	Mean	26.55	14.10	23.29	14.80
Low (C3)	Mean	17.51	14.78	18.35	14.29
N		300	300	300	300

The f ratio on Mental Imagery sub scale B – Auditory Images of Variable A – Type of school board, Variable B – Gender of school students and Variable C – Internet Addiction Level which is 3.23 and is significant at 0.05 level. So, “There is no significant interaction effect between type of school board, gender and internet addiction level of students with regard to Mental Imagery sub scale B – Auditory Images”, is rejected. That means variable A\*B\*C is significantly contributing to the Mental Imagery sub scale B – Auditory Images. The hypothesis was formulated to know whether there is a influence of mental imagination (Auditory) on types of school board, gender of school students and level of internet addiction. The F value obtained indicated that the hypothesis was rejected.

Table no 6 shows mean scores of ICSE board male (boys) having high internet addiction level is 26.91, the mean scores of ICSE board male (boys) having medium internet addiction level is 26.55 and the mean scores of ICSE board male (boys) having low internet addiction level is 17.51. The mean scores of ICSE board female (girls) having high internet addiction

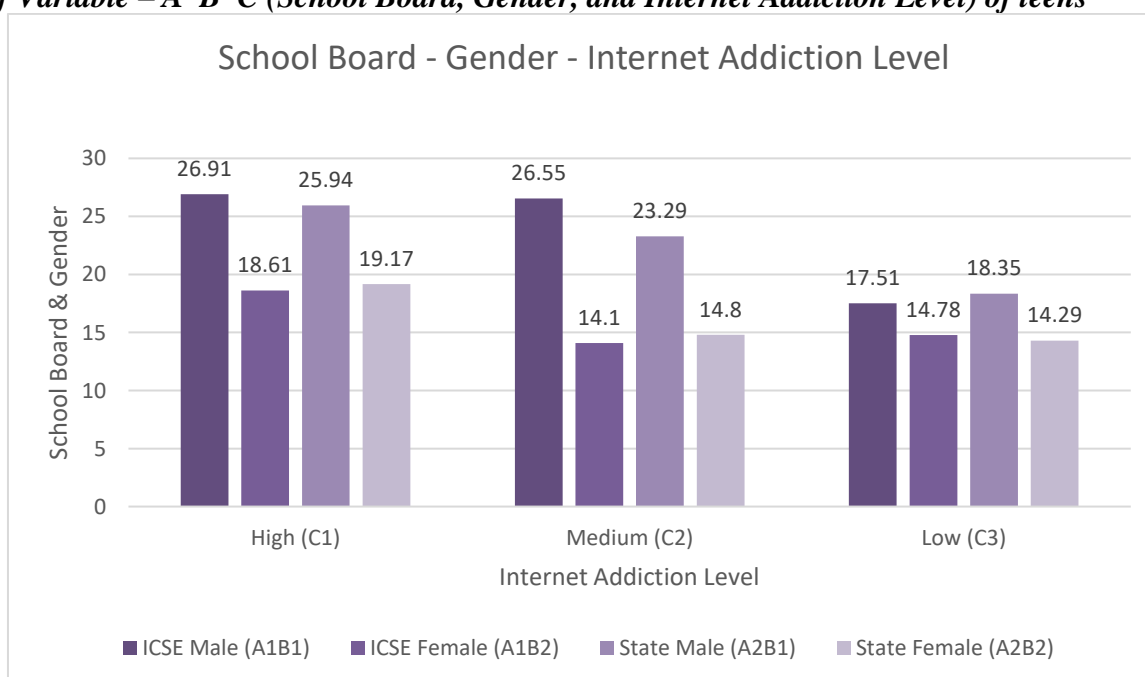
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level are 18.61, the mean scores of ICSE board female (girls) having medium internet addiction level are 14.10 and the mean scores of ICSE board female (girls) having low internet addiction level is 14.78.

The mean scores of State board male (boys) having high internet addiction level are 25.94, the mean scores of State board male (boys) having medium internet addiction level are 23.29 and the mean scores of State board male (boys) having low internet addiction level is 18.35. The mean scores of State board female (girls) having high internet addiction level are 19.17, the mean scores of State board female (girls) having medium internet addiction level are 14.80 and the mean scores of State board female (girls) having low internet addiction level is 14.29.

It means significant interaction effect does exist between type of school board, gender, and internet addiction level of school students.

**Fig No:7: Chart Showing Mean scores of Mental Imagery sub scale, B – Auditory Images of Variable – A\*B\*C (School Board, Gender, and Internet Addiction Level) of teens**



## DISCUSSION

High aggression was observed in females compared to males, which could be attributed to the progression associated with puberty, in addition to digital addiction, which might cause emotional imbalance leading to increased aggression. Numerous research studies have demonstrated a direct correlation between the level of internet addiction and aggression. The current research findings also suggest that students with high internet addiction levels exhibit more aggressive behaviour compared to those with low or no internet addiction levels.

In the current study, aggression in female students attending State board schools was found to be higher compared to other groups of students. Although there is limited research on this subject, there is a strong association between spending long hours on social media or digital platforms and aggressive behaviour. However, it cannot be denied that the actual reason for aggression could be due to puberty or other underlying factors.

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It was found that ICSE board students showed a higher level of curiosity compared to State board students. The reason could be the highly competitive educational environment that places more emphasis on hard skills, while essential skills like curiosity are overlooked. Previous studies have shown that males exhibit higher curiosity compared to females, but there is less research on millennials. This could be because this generation is raised in similar environments and has equal opportunities. Additionally, while some students showed low levels of curiosity, there was no significant difference between male and female students. Further research and statistical analysis may be necessary to explore the interaction effect between school board and gender.

The current research indicated that high internet addiction in students can lead to low curiosity. This could be attributed to the lack of unstructured playtime in students' lives, as they are often overscheduled with activities and screen time addiction, leaving little time for curiosity or free play. Although there was a difference in curiosity levels between school boards, there was no specific gender difference. This suggests that curiosity is not gender-specific or has the same effect on both genders.

Mental imagery, from a generic point of view, is a cognitive process where reality is represented through multisensory mental images or representations of perceived or remembered objects. High internet addiction was found to affect mental imagery, as memories created through internet or digital media may not be conducive to positive growth. There was a direct link between high internet addiction levels and below-average mental imagery. This indicates a significant interaction effect between school board, gender, and internet addiction levels on mental imagery.

In conclusion, the influence of internet addiction on sensory perceptions, including visual, auditory, and gustatory imagery, is evident among school students. Further research is needed to explore the underlying reasons for these effects and to develop interventions to mitigate the negative impacts of internet addiction on sensory perception and cognitive processes.

### **CONCLUSION**

The aim of this research study was to uncover the reasons behind digital addiction among today's youth, often termed the "glass generation," as existing studies have focused more on its effects rather than its causes. Digital addiction, exacerbated by the widespread use of technology, particularly the internet, has been linked to increased aggression levels among school students. Moreover, it has hindered curiosity and mental imagery abilities, affecting various aspects of students' lives. This study emphasizes the need for a deeper understanding of digital addiction and its underlying causes to inform effective interventions and strategies aimed at mitigating its detrimental effects on youth development.

Just like any other addiction, digital addiction can serve as a way for children to escape the real world. As times are changing, so are habits, with the most impressionable among us being our future - our children. The delicate balance between the virtual and the real world is tipping in favour of the virtual among children, with increasing screen times and ubiquitous mobile phones replacing real friendships and traditional games. Research has shown that this shift is robbing them of natural curiosity, while mental imagery is gradually being corrupted as nothing is left to the imagination anymore.

The decay started long ago with the introduction of 24-hour television and handheld video games, but the advent of dual-career families, mobile internet, and smartphones has

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accelerated the decline. The internet's homogeneous spread grants both parents and children access to similar content, with age restrictions often being merely formalities. The rise of social media and short-format videos has further corrupted social evolution, exposing and affecting children. Without corrective action from society, the consequences could be irreversible.

Technological development cannot be halted, but the unbridled use of technological devices for personal entertainment among children risks stunting future generations. Digital addiction is thus a pressing issue in today's world and for the foreseeable future. In a landscape inundated with information and imagery overload, children and their parents need to discern reliable sources. Societies must adapt to changing norms, governments must enact effective regulations, and individuals must recognize the distinction between reality and the virtual world.

In conclusion, digital addiction is a burning topic that demands attention in our times and those to come. Understanding the difference between reality and the virtual world is crucial, as the virtual remains an emphatic illusion that can never become real. It is imperative that we navigate the digital age responsibly to safeguard the well-being and development of future generations.

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### **Conflict of Interest**

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