

Unravelling the Attention Crisis: Investigating Student Engagement in Contemporary Classrooms

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Unravelling the Attention Crisis: Investigating Student Engagement in Contemporary Classrooms

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Abstract: In the evolving educational landscape, there has been a growing concern regarding student engagement and attention in classrooms. From primary schools to universities, many educators grapple with challenges in capturing and maintaining student interest. This study seeks to dissect the underpinnings of this "Attention Crisis" and to discern its root causes. Drawing on data from 600 university students through structured questionnaires, we employed regression and ANOVA methodologies using SPSS 22 for data analysis. Our exploration centered on three key variables: student abilities, teacher and teaching methodologies, and the external learning environment. Our findings underscore the paramount significance of the environmental context in influencing student attention and engagement. It was discerned that the learning milieu substantially molds a student's focus and overall attention span. This research offers an in-depth examination of the precipitants of this engagement challenge, particularly as it pertains to Generation Z, and proffers insights into potential strategies and modifications to mitigate this pressing issue. However, the study's scope is geographically limited, suggesting a need for broader investigation to achieve more comprehensive and generalizable results. In summation, to foster enriched learning experiences, it is imperative to prioritize and optimize the external educational environment, as it emerged as the pivotal factor in student attentiveness.

Keywords: Teaching, Teaching Methods, Education, Attention Span, Students ability, Environmental factors, Distractions, Generation Z, Technology

1. Introduction

The education sector has long been a cornerstone of societal advancement, nurturing minds and preparing individuals for the complexities of the future. Yet, a pressing issue is emerging that threatens this foundational role: the "Attention Crisis." Across the educational spectrum, from primary institutions to tertiary establishments, educators increasingly report signs of disengagement and waning attentiveness among students.^{3,2)} This phenomenon isn't an isolated instance but appears to be a pervasive trend impacting classrooms worldwide. Traditional chalk-and-talk methods, once the gold standard for imparting knowledge, are now often met with glazed eyes and distracted minds. As the digital age continues to shape the behaviors and expectations of students, particularly those from Generation Z, the challenge compounds. Raised in an era dominated by instantaneous information, bite-sized content, and multifaceted stimulations, these students bring unique learning dynamics to the table. While it's easy to cast

aspersions on teaching methodologies or curriculum content, the issue of dwindling student engagement might not be solely attributed to these factors. The larger environment, encompassing societal shifts, technological advancements, and evolving learner profiles, plays a considerable role. Identifying the root of the problem is crucial to ensure that education remains effective and relevant. This study is a response to this pressing need, aiming to unravel the nuances of the attention crisis, trace its origins, and pinpoint its most influential contributors. Through this, we hope to illuminate pathways for reinvigorating the educational experience for today's learners.

The term Generation Z widely refers to the population born in between the years of 1997 to 2012. This population consists of people ranging from the ages of 7 to 22 years old, referring to the current youth population of the world. Research shows that the average attention span of a member of Generation Z is only 8 seconds, making it even shorter than that of a goldfish. This is far shorter than the millennial generation before them, who

reached their limit at a still disappointing 12 seconds. This number raises the issue of how many pupils have trouble paying attention in class and remembering what they've learned. The attention span of today's students is far shorter than that of their predecessors from even two decades ago.³³⁾

The attention span of today's students is far shorter than that of their predecessors from even two decades ago.³³⁾ The attention span of a youngster can be anywhere from two minutes to as long as ten to eighteen minutes, according to recent studies in the field of education.³²⁾

Modern educators are dissatisfied with class participation and engagement.⁹⁾ If today's youngsters have problems focusing and remembering what they've learned in school, they won't be able to get the most out of their education and won't be able to reach their full potential. Educators' practices need updating to meet the needs of today's distracted students.¹⁴⁾

The primary objective of this research is to comprehensively understand the intricacies of student attention spans in the modern educational context.²²⁾ Specifically, the study aims to identify and elucidate the factors that impact the attention span of students, drawing from both intrinsic and extrinsic variables. Building on this foundation, the research will delve into the exploration and critical analysis of prevailing theories pertaining to student attention spans, aiming to distinguish and correlate theoretical frameworks with empirical observations. Lastly, in response to the identified challenges, the study endeavors to pinpoint and recommend effective solutions that can address and potentially rectify the prevalent issues of diminished attention spans among students, with the overarching goal of enhancing student engagement and learning outcomes.

1.1 Problem Statement

Amidst the rapidly changing educational landscape, a burgeoning concern has emerged, commonly referred to as the "Attention Crisis."¹⁵⁾ Teachers and educators, irrespective of the level of instruction, are increasingly observing reduced engagement levels and shorter attention spans among students.²³⁾ These attentional challenges, which appear endemic across both primary and higher educational institutions, threaten the efficacy of traditional teaching methodologies and potentially jeopardize learning outcomes. The digital era, characterized by its instantaneous information flow and constant stimuli, has significantly reshaped the attentional capacities and expectations of today's students, particularly Generation Z.²⁵⁾ While several anecdotal accounts and individual studies have highlighted facets of this problem, there remains a critical need for a comprehensive examination.¹⁶⁾ Understanding the root causes, theoretical underpinnings, and potential solutions of this attention crisis is paramount.¹⁸⁾ If left unaddressed, this could result in suboptimal learning experiences, which will not be able to handle the challenges of the

future.²⁴⁾ This research seeks to provide a holistic understanding of the issue, aiming to bridge the existing knowledge gaps and offer actionable insights to the academic community.

2. Theories Involved

The capacity theory, mental bottleneck theory, and selective attention theories are primary theories of attention, developed by mental health experts.¹⁷⁾ These theories aim to understand how humans direct their attention to external stimuli and identify appropriate treatments for attentional issues. Multitasking is also considered in some theories.¹⁸⁾ The bottleneck attention theory suggests that each person has a built-in mental filter that allows only a certain amount of information to be processed at once.²⁰⁾ This filter sorts essential and relevant information, while other inputs are either blocked or partially flow through the filter. This theory has been the basis for theories of selective attention, Information Processing Theory, Many Intelligences Hypothesis, Executive Function Theory, Arousal Theory, and Attentional Control Theory.¹⁹⁾

George Miller, Jerome Bruner, and Ulric Neisser's Information Processing Theory emphasizes selective attention, ignoring other information.²⁵⁾ Better-focused students can concentrate. Howard Gardner's 1983 Many Intelligences Hypothesis posits that pupils have several intelligences, and that attention span may be related to them.²⁷⁾

Executive Function Theory, an attention span theory, identifies three main executive functions: inhibition, working memory, and cognitive flexibility.³⁰⁾ These components aid complicated cognitive tasks like focusing and avoiding distraction. According to the Arousal Theory, students who are too aroused have trouble focusing, whereas those who are not do not. Robert Yerkes and John Dodson's Yerkes-Dodson Law states that an individual's ideal level of arousal depends on the situation.²⁶⁾

The Cognitive Theory of Attention (ACT) explains how people manage and utilize their attentional resources²⁸⁾. The stimulus-driven system allocates attention involuntarily, while the goal-directed system allocates attention voluntarily.³¹⁾ These two mechanisms decide attentional allocation. Goal-directed and stimulus-driven systems affect attentional control, according to the Attentional Control Theory (ACT). Donald Broadbent's 1958 Selective Attention Theory implies kids can only focus on a certain quantity of information.

Feature integration theory and orienting network theory are other selective attention models. Self-Determination Theory (SDT) says that meeting basic psychological needs like curiosity, enjoyment, and fulfillment increases intrinsic motivation.²⁹⁾ Those who cannot meet these demands may rely on external causes, decreasing intrinsic motivation and well-being.

3. Literature Review

"Attention span during lectures: 8 seconds, 10 minutes, or more?" by Neil A. Bradbury, published on November 8, 2016, claims that lectures longer than 15 minutes are ineffective due to too much filler and unfocused content. He concludes that classes should provide relevant information to help pupils retain more.¹⁾

According to Farrer (2023), Attention psychology uses several ideas to find solutions for people with attention issues. Modern multitasking is popular, yet some psychologists use attention theories to show its inefficiency.²⁾

Junco, R. (2012). Junco explores the relationship between Facebook use, Facebook activities, and student engagement in this study report. The study surveyed 1,839 college students online. Facebook users who shared links, commented on posts, and sent private messages had increased student involvement. The survey also indicated that academically using Facebook increased student involvement. The findings imply that academic use of social media sites like Facebook can boost student participation.⁷⁾

Rosen et al. (2011) studies how text message-induced task switching affects classroom learning. The authors had participants perform a reading comprehension assignment while receiving text messages that distracted them. Task switching hurt reading comprehension and academic achievement.¹⁰⁾

These findings have educational consequences, and the authors propose that professors encourage students to turn off their phones or use them only for educational purposes during class. The research indicates that knowing how technology affects learning and guiding students and teachers on how to use technology effectively in the classroom are crucial.

"A comprehensive investigation into the relationship between student attention and academic achievement" by Toker and Baturay examines this issue. 326 Turkish high schoolers were studied. A self-report questionnaire and a computerized attention test measured attention.¹¹⁾

Attention was linked to academic success in the study. High-attention students had higher GPAs. The study also showed no significant gender or grade level effects on attention and academic ability. The study found that favorable learning environments, interesting teaching methods, and frequent feedback can assist teachers improve students' attention. They also recommend studying attentional training programs' academic benefits.

Hembrooke and Gay (2003) examined how multitasking in university lectures, particularly with computers, affects learning results. 80 undergraduate students from four classes were randomly allocated to either laptop or pen-and-paper notetaking. Laptop users spent more time on non-academic activities like browsing the internet and sending emails, which impacted their comprehension and recollection of the lecture material. Handwritten notes improved lecture comprehension and recall.⁴⁾

Guo, K., and Zhong (2023) propose a novel classroom debate approach using chatbots for argumentative dialogues. The three-stage approach involves students interacting with Argumenta, discussing ideas with their group, and participating in debates. The study uses data from four debate groups, revealing fruitful idea generation.³⁴⁾

The paper by Mohd, C. K., and Nuraini (2023) lists gamification tools for teaching and learning in higher education, aiming to transform education and prepare students for future employment in a technology-driven environment.³⁵⁾ The study by Khan, Gul, and Zeb (2023) suggests that educational stakeholders should focus on student engagement to improve academic production and accomplishment. It recommends implementing various classroom activities that appeal to students' cognitive functions.³⁶⁾ The study by Khaerani, Lintangari, & Gayatri (2023) found that technology-equipped offline classrooms significantly improved learning engagement in various dimensions, with emotional engagement not significantly different. The research suggests further exploration of EFL teaching techniques and technologies.³⁷⁾

The study found that computers in classrooms may distract students and lower academic performance, so teachers should be mindful of these risks while using technology.

Kirschner and van Merriënboer's (2013) "Do learners really know best?" Urban legends in education dispute the idea that students know what's best for them. The authors claim that this "urban legend" has permeated education despite a lack of scientific evidence.⁸⁾

The authors note that learners choose ineffective learning tactics like rereading or underlining text over evidence-based strategies like practice testing and distributed practice, which are less appealing but better for long-term memory. The authors recommend using research-based ways to teach rather than learner preferences.

"The 'myth' of media multitasking: Reciprocal dynamics of media multitasking, personal needs, and gratifications" by Wang and Tchernev (2012) examines media multitasking and its pros and cons. The authors claimed that media multitasking decreases productivity and cognitive performance. They argue that this is a "myth" and that media multitasking may have benefits.¹²⁾

A theoretical paradigm that claims media multitasking is driven by human demands and gratifications, which are modified by individual and environmental factors. Media multitasking can serve recreational, social, and information requirements, they say.

Garris, Ahlers, and Driskell (2002) examine games, motivation, and learning. This link and its implications for game-based learning are explored in a study and practice approach.³⁾

Games encourage learners by giving challenge, feedback, and control, the authors found. Games also

encourage problem-solving, investigation, and experimentation, which can improve learning. Games also simulate real-world events and tasks, promoting learning transfer.

Game design, motivation, and learning outcomes are the authors' research and practice model. Rules, objectives, feedback, and interactivity affect motivation and learning in game design. Interest, enjoyment, challenge, and perceived competence increase learning engagement and persistence. Knowledge, skills, attitudes, and transfer demonstrate learning efficacy and relevance.

"Race, gender, and information technology use: The new digital divide" by Jackson et al. (2008) examines how race and gender affect IT use. The authors contend that while prior research has found a digital divide in technology access, there is also a digital divide in technology use⁶⁾

The study surveyed 527 people of various races and ethnicities. African Americans and Hispanics used the internet and other information technology less than Caucasians. Women used technology less than males. Educational attainment, income, and technology views may explain these differences, according to the authors. Technology users also had better education, wealth, and occupational status. They used technology for employment, communication, pleasure, and education. Those who used technology less often used it for email and social networking.¹²⁾

"A study of multimedia animation design as cognitive assistance for students' science learning" by Hwang et al. (2008) examines how multimedia animation design affects science learning. External representation and scaffolding are studied in cognitive support. 126 eighth-graders from two public junior high school classes participated in Taiwan. Students were randomly assigned to experimental or control groups. Multimedia animation design helped the experimental group learn, whereas the control group received traditional training.⁵⁾

The experimental group outperformed the control group in learning. The experimental group performed better in understanding difficult concepts and applying information to new contexts. The authors believe that multimedia animation design might give external representation and scaffolding to help students grasp and apply scientific topics.

4. Three Factors that affect Attention Span of students

Several things might affect a student's focus in class, but here are three of the most important ones to consider: Student's Ability: A student's ability to focus and stay on task is greatly influenced by the classroom's physical setting. A student's ability to concentrate can be helped or hurt by factors like classroom noise, temperature, lighting, and layout. Sustaining focus is easier in a classroom that is calm, well-organized, and has good lighting and a pleasant temperature.

Teaching Methods used by teacher or faculty member: Instructional strategies play a significant impact in attracting and retaining students' interest. Sustained attention can be encouraged using discussion, hands-on activities, and visual aids in the classroom. On the other side, students may become bored and pay less attention if their teachers rely too heavily on lectures.

4.1 Student's Environment or surrounding

Each individual student has their own set of circumstances that can affect their ability to focus. These include variations in students' levels of interest and motivation, as well as their backgrounds, interests, and preferred methods of learning. Students will pay closer attention and retain more information if they perceive the topic to be personally relevant and entertaining. A student's capacity to focus may also be affected by their exhaustion, hunger, emotional condition, and general health.

Students' capacity to focus on class can be affected by a few issues beyond their own attention span, including but not limited to technological distractions, personal situations, and learning difficulties.

5. Hypothesis Testing

5.1 The following hypotheses were tested

- H1: There is a significant relationship between Student's Ability and attention span of student.
- H2: There is a significant relationship between teaching methods used by teachers and attention span of student.
- H3: There is a significant relationship between surrounding or environment and attention span of student.

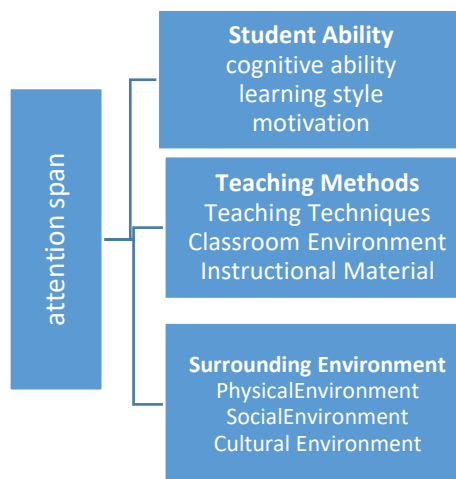


Fig1: Conceptual framework of Hypothesis

6. Research Methodology

This study will employ a mixed-methods research design, combining quantitative and qualitative approaches to gain a comprehensive understanding of student engagement in contemporary classrooms. The present study focused on the attention span of students studying in various private universities in various technical and non-technical courses in Jaipur, Rajasthan. The study was carried out in Jaipur, Rajasthan to find the factors determining the attention span of students. Stratified random sampling to ensure representation across different demographics and University. A structured questionnaire with Likert scale items to assess students' self-reported levels of engagement, factors affecting attention, and the impact of technology in the classroom. To summarize the basic features of the data, including means, standard deviations, and frequency distributions. Regression analysis used to identify the factors significantly influencing student engagement, and ANOVA to compare engagement levels across different demographic groups. A total of 680 students were willing to give a response during the scheduled time of visit. The following table shows the data source:

Table 1. Participants selected for present investigation

University	Total Respondents	Sample Retained
Vivekanada Global University, Jaipur	159	150
Manipal University Jaipur	175	160
JECRC University	180	170
Poornima University	110	94
SGVU, Jaipur	56	26
Total	680	600

Based on the literature review, three factors were filtered out that are affecting students' attention span. The variables were Student's Ability, teaching methods used by teachers and surrounding or environment. The structured questionnaire used comprised 5-point Likert scale from strongly agree to strongly disagree. With complete information, 600 responses were considered useful out of 680 for analysis and interpretation. Descriptive statistics like percentage analysis and the weighted average and chi-square test were used to analyze and interpret the data. The data collected were tabulated, analyzed through SPSS version 20 and presented through tables.

7. Analysis and Findings

In the quest to unravel the complexities surrounding students' attention span, our research meticulously examined three cardinal factors that have shown significant bearing on students' engagement in the

classroom setting.

Student's Ability: The analysis revealed that the classroom's physical attributes, including noise levels, lighting conditions, temperature, and spatial organization, significantly correlate with a student's concentration prowess. In essence, a conducive learning environment that champions tranquility, optimal lighting, and a comfortable ambient temperature fosters improved student focus.

7.1 Teaching Methods

The instructional strategies employed by educators emerged as another pivotal determinant. Engaging teaching approaches, encompassing interactive discussions, hands-on learning experiences, and visual aids, invariably bolster students' sustained attention. In contrast, a predominant reliance on traditional lecture formats often precipitates waning interest among students.

Student's Environment: Intriguingly, the broader environmental context of a student, encompassing their personal backgrounds, intrinsic motivations, emotional states, and health, showcased a notable influence on their attentional capacities. Students demonstrated heightened engagement when the subject matter resonated with their personal interests and life contexts.

Further reinforcing these findings, hypothesis testing was conducted:

- H1 confirmed a significant correlation between Student's Ability and their attention span.
- H2 revealed a pronounced relationship between the teaching methodologies and the students' engagement levels.
- H3 established the profound impact of the broader environmental context on a student's attention span.

To ensure robustness in our analysis, the research concentrated on students from multiple private universities in Jaipur, Rajasthan, encompassing diverse academic streams. From an initial pool of 680 respondents, 600 responses were deemed viable for comprehensive evaluation. Leveraging SPSS version 20, sophisticated analytical tools, including chi-square tests and descriptive statistics, were employed. The data, presented through concise tables, unequivocally emphasized the intertwined relationship between the aforementioned factors and students' attention span in contemporary educational settings.

7.2 Reliability Test

Ensuring the consistency and reliability of the tools used in research is paramount for drawing credible conclusions. For the present investigation, the reliability of the structured questionnaire was measured using Cronbach's Alpha coefficient—a widely acknowledged index for internal consistency of research instruments. Referring to Table 2, the Cronbach's Alpha value obtained was .944, indicating a high level of internal consistency

for our scale with the 20 items under evaluation. It's notable that the same Alpha value was reflected even when considering standardized items, further bolstering the reliability of the research instrument. In the realm of academic research, an Alpha value exceeding 0.7 is typically deemed acceptable, with values approaching 1.0 illustrating exemplary consistency. With our result of .944, it can be confidently asserted that the instrument utilized for the present study is not only reliable but also ensures consistent and dependable results, reinforcing the overall validity and integrity of the research findings.

Table 2. Reliability results for present investigation

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.944	0.944	20

Table 3. Statistical results for present study

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Self Discipline	71.2317	213.738	.635	.941
Prior Knowledge related to topic	71.0267	215.742	.608	.942
Area of Interest	71.0033	210.614	.738	.940
Curiosity and imagination	71.1350	213.479	.615	.942
Critical thinking and problem-solving skills	71.1150	211.187	.692	.940
Game-based learning.	71.0833	213.102	.607	.942
hands-on activities	71.2317	213.738	.635	.941
Interactive discussions	71.0267	215.742	.608	.942
Use of audio visual aids	71.0033	210.614	.738	.940
Lecture based learning	71.1350	213.479	.615	.942
Peer group	71.1150	211.187	.692	.940
Family support	71.0833	213.102	.607	.942
Role of mentor and teachers	71.1150	211.187	.692	.940
Physical environment like noise level, lighting, temperature	71.0833	213.102	.607	.942
Amount of positivity in the surrounding	71.0033	210.614	.738	.940
Easily focus during class lectures or discussions	71.1350	213.479	.615	.942
My mind keeps on wandering or getting distracted during class	71.1150	211.187	.692	.940
I feel engaged and attentive when studying or completing assignments in class	71.0833	213.102	.607	.942
Always feel bored or lose interest during class activities or presentations	71.2317	213.738	.635	.941
Amount of positivity in the surrounding	71.0033	210.614	.738	.940

Source: SPSS Software

Table 4. Correlation matrix results

	Self Discipline	Prior Knowledge related to topic	Are a of Interest	Curiosity and imagination	Critical thinking and problem-solving skills	Game-based learning.	handson activities	Interactive discussions	Use of audio visual aids	Lecture based learning	Peer group	Family support	Role of men for and teachers	Physical environment like noise level, lighting, temperature	Amount of positivity in the surrounding	Easily focus during lectures or discussions	My mind wanders or getting distracted during class	I feel engaged and attentive when studying or completing assignments in class	Always feel bored or lose interest during class activities or presentations	Amount of positivity in the surrounding	
Self Discipline	1.16	0.464	0.484	0.477	0.592	0.257	1.16	0.464	0.4	0.477	0.5	0.257	0.592	0.257	0.484	0.477	0.592	0.257	1.16	0.484	
Prior Knowledge related to topic	0.464	1.03	0.45	0.569	0.394	0.39	0.464	1.03	0.4	0.569	0.3	0.39	0.394	0.39	0.45	0.569	0.394	0.39	0.464	0.45	
Area of Interest	0.484	0.45	1.165	0.366	0.606	0.55	0.484	0.45	1.1	0.366	0.6	0.55	0.606	0.55	1.165	0.366	0.606	0.55	0.484	1.165	
Curiosity and imagination	0.477	0.569	0.366	1.26	0.446	0.437	0.477	0.569	0.3	1.26	0.4	0.437	0.446	0.437	0.366	1.26	0.446	0.437	0.477	0.366	
Critical thinking and problem solving skills																					
Game-based learning	0.592	0.394	0.606	0.446	1.248	0.292	0.592	0.394	0.6	0.446	1.2	0.292	1.248	0.292	0.606	0.446	1.248	0.292	0.592	0.606	
Game-based learning	0.257	0.39	0.55	0.437	0.292	1.336	0.257	0.39	0.5	0.437	0.2	1.336	0.292	1.336	0.55	0.437	0.292	1.336	0.257	0.55	
hands-on activities	1.16	0.464	0.484	0.477	0.592	0.257	1.16	0.464	0.4	0.477	0.5	0.257	0.592	0.257	0.484	0.477	0.592	0.257	1.16	0.484	
Interactive discussions	0.464	1.03	0.45	0.569	0.394	0.39	0.464	1.03	0.4	0.569	0.3	0.39	0.394	0.39	0.45	0.569	0.394	0.39	0.464	0.45	
Use of audio visual aids	0.484	0.45	1.165	0.366	0.606	0.55	0.484	0.45	1.1	0.366	0.6	0.55	0.606	0.55	1.165	0.366	0.606	0.55	0.484	1.165	

Lecture based learning	0.477	0.569	0.366	1.26	0.446	0.437	0.477	0.569	0.3	0.3	1.26	0.46	0.437	0.446	0.437	0.366	1.26	0.446	0.437	0.477	0.366
Peer group	0.592	0.394	0.606	0.446	1.248	0.292	0.592	0.394	0.6	0.6	0.446	0.48	0.292	1.248	0.292	0.606	0.446	1.248	0.292	0.592	0.606
Family support	0.257	0.39	0.55	0.437	0.292	1.336	0.257	0.39	0.5	0.5	0.437	0.92	1.336	0.292	0.55	0.437	0.437	0.292	1.336	0.257	0.55
Role of mentor and teachers	0.592	0.394	0.606	0.446	1.248	0.292	0.592	0.394	0.6	0.6	0.446	0.48	0.292	1.248	0.292	0.606	0.446	1.248	0.292	0.592	0.606
Physical environment like noise level, lighting, temperature	0.257	0.39	0.55	0.437	0.292	1.336	0.257	0.39	0.5	0.5	0.437	0.92	1.336	0.292	0.55	0.437	0.437	0.292	1.336	0.257	0.55
Amount of positivity in the surrounding	0.484	0.45	1.165	0.366	0.606	0.55	0.484	0.45	1.1	0.6	0.366	0.06	0.55	0.606	1.165	0.366	0.366	0.606	0.55	0.484	1.165
Easily focus during class lectures or discussions	0.477	0.569	0.366	1.26	0.446	0.437	0.477	0.569	0.3	0.3	1.26	0.46	0.437	0.446	0.437	0.366	1.26	0.446	0.437	0.477	0.366

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My mind keeps wandering or getting distracted during class	0.592	0.394	0.606	0.446	1.248	0.292	1.336	0.292	1.248	0.292	0.606	0.446	1.248	0.292	0.592	0.606
I feel engaged and attentive when studying or completing assignments in class	0.257	0.39	0.55	0.437	0.292	1.336	0.257	1.16	0.464	0.592	0.484	0.477	0.592	1.16	0.484	0.55
Always feel bored or lose interest during class activities or presentations	1.16	0.464	0.484	0.477	0.592	0.257	1.16	0.464	0.477	0.592	0.484	0.477	0.592	1.16	0.484	0.55
Amount of positivity in the surrounding	0.484	0.45	1.165	0.366	0.606	0.55	0.484	0.45	1.1	0.65	0.366	0.6	0.606	0.484	1.165	1.165

Source: SPSS Software

The correlation matrix in Table 4 showcases the interrelationships between various parameters influencing a student's attention span. High correlation values indicate strong associations between the parameters.

Self-Discipline demonstrates significant correlations with multiple parameters, especially with Critical Thinking and Problem-Solving Skills (0.492) and Lecture Based Learning (0.394). This implies that students with higher self-discipline might inherently have better critical thinking abilities and might respond positively to traditional lecture methods.

Prior Knowledge Related to Topic is highly correlated with Curiosity and Imagination (0.500), suggesting that students with prior knowledge on a subject might be more curious and imaginative about it.

The strong correlation between Area of Interest and Use of Audio-Visual Aids (1.000) indicates that subjects of interest can be enhanced with the incorporation of audio-visual aids.

A noteworthy observation is the relationship between Curiosity and Imagination and Lecture Based Learning (1.000). This suggests that imaginative students may find lectures engaging, contrary to the general perception.

Interestingly, Critical Thinking and Problem-Solving Skills possess strong correlations with parameters like Peer Group (1.000) and Role of Mentor and Teachers (1.000), emphasizing the role of social and mentor support in honing these skills.

The matrix results underline the intricate web of relationships between different educational aspects and student characteristics. Addressing these interrelationships holistically can lead to enhanced teaching strategies, ensuring optimal student engagement.

7.3 Demographic Features

From the analysis of the demographic statistics of the respondents shown in Table-1, it was found that (62%) male and were between 18-22 years of age. 58.67% of the respondents are from graduate courses and 41.33 % of them are post graduate perusing courses. About parent's occupation is concerned, 38.67 percent were business class followed by other professions with 61.33 percent. Only 21.33 percent of the respondents were belonged to the families who were having income of less than Rs.30000

per month but rest 78.67 percent are from well off families which means there is no scarcity of resources related to education.

Table 5. Demographic Profile of the Respondents (N=600)

Demographic features	Variables	Percentage of Respondents
Gender	Male	62.00
	Female	38.00
	Total	100.00
Age	18-20 years	68.00
	20-22 years	21.33
	More than 22 years	10.67
	Total	100.00
Course Pursuing	Graduate (Non-Technical/Technical)	58.67
	Post Graduate (Non-Technical/Technical)	41.33
	Total	100.00
Father's/ Mother's Occupation	Freelancer	22.00
	Service	10.67
	Business	38.67
	others	28.66
Monthly family income per month	Total	100.00
	Below Rs.30,000	21.33
	30001-60000	36.67
	60001-90000	34.66
	>90001	07.34
	Total	100.00

7.4 Level of attention span of students

Students' inability to concentrate during class lectures, accompanied with frequent interruptions and a general lack of interest in the material being presented was determined by asking them five questions on a Likert scale from one to five points. Most of the students' report feeling bored throughout class, which contributes to a general disinterest in learning.

Table 6. Level of attention span of students (N=600)

Attention Span of Students	Strongly Agreed (5)	Agreed(4)	Neutral(3)	Disagreed (2)	Strongly Disagreed (1)
Easily focus during class lectures or discussions	18	9.34	15.33	25.33	32
My mind keeps on wandering or getting distracted during class	42	44.36	3.64	4.33	5.67
I feel engaged and attentive when studying or completing assignments in class	8.33	12	19	25.33	35.34
Always feel bored or lose interest during class activities or presentations	30	34.33	11.33	11.67	12.67
Always remember what I've learned in class without any review or revision	10.67	5.33	10.67	32	41.33

Table 7. Student’s ability and attention span of students (N=600) H1

Student Abilities	Influence on attention span of students (%)				
	Strongly Agreed(5)	Agreed(4)	Neutral(3)	Disagreed(2)	Strongly Disagreed(1)
Self-Discipline	42.66	31.34	10	8.66	7.34
Prior Knowledge related to topic	31.33	46.33	11	4.67	6.67
Area of Interest	34.67	43.33	12.67	6	3.33
Curiosity and imagination	45.03	41.88	3.95	4.02	5.12
Critical thinking and problem-solving skills	47.33	42.67	4	3.33	2.67

Table 8. Model Summary results H1

Model Summary									
Model	R	R Square	AdjustedR Square	Std. Error of the Estimate	Change Statistics				
					Change	F Change	df1	df2	Change
1	.819 ^a	.671	.670	.57422539	.671	1218.611	1	598	.000

a. Predictors: (Constant), Student Abilities

Table 6 provides a comprehensive view of students' self-assessment on their attention spans. A significant proportion (32%) strongly disagreed that they could easily focus during class lectures, whereas a high percentage (42%) strongly agreed that their minds often wandered during sessions. These numbers raise concerns about the prevalent teaching methods, given the evident attention span challenges faced by students. Over one-third of students (35.34%) strongly disagreed about feeling engaged and attentive during classwork. Moreover, a substantial 41.33% strongly disagreed that they retained class learnings without subsequent reviews, pointing to a possible lack of effective learning strategies or content delivery methods.

Table 7 delves into the influence of specific student abilities on their attention spans. Over 70% of students agreed (either agreed or strongly agreed) that self-discipline, prior knowledge related to the topic, and area of interest played a pivotal role in their attention spans. Intriguingly, almost 90% of students believed that their critical thinking and problem-solving skills had a positive impact on their attention, underscoring the need for cultivating these skills. Table 8's model summary presents a significant correlation between student abilities and their attention spans. With an R Square of 0.671, the model indicates that approximately 67.1% of the variance in

students' attention spans can be attributed to their abilities. The significant F Change value reinforces the strong predictive power of student abilities on their attention spans. These results emphasize the paramount importance of nurturing essential skills and abilities in students to foster improved attention spans, ultimately leading to better academic outcomes.

7.5 Hypothesis Testing and result analysis of Student’s Ability and attention span of student

Table 7 shows the data representation and various question asked to find out the relation between student’s ability and attention span of students. H1: There is a significant relationship between Student’s Ability and attention span of student.

In this regression table the R square and the R value represent the relationship between the dependent and independent variable as attention span of the students and the students’ abilities they are value is 0.819 whereas are square value is 0.671 through that we can say that this model is good fit. Researcher points that are square value is 671 that means attention span of the students 67% explain by the students’ abilities. 33% of the effect on attentions when of student is due to other factors.

Table 9. ANOVA testing results H1

ANOVA ^a						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	401.819	1	401.819	1218.611	.000 ^b
	Residual	197.181	598	.330		
	Total	599.000	599			

a. Dependent Variable: Attention Span of student
 b. Predictors: (Constant), Student Abilities

Table 10. Teaching methods and attention span of students (N=600) H2

Teaching methods used by teacher	Influence on attention span of students (%)				
	Strongly Agreed (5)	Agreed (4)	Neutral (3)	Disagree (2)	Strongly Disagreed (1)
Game-based learning.	46.33	44.67	2.00	4.66	2.34
hands-on activities	41.33	32.00	10.67	10.67	5.33
Interactive discussions	44.00	42.67	4.00	2.67	6.66
Use of audio-visual aids	25.33	31.33	16.00	20.00	7.34
Lecture based learning	28.00	30.67	14.67	12.66	14.00

Table 11. Model Summary for H2

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					Change	F Change	df1	df2	Sig. F Change
1	.854 ^a	.729	.729	.52093305	.729	1609.308	1	598	.000

a. Predictors: (Constant), Teaching methods used by teacher

Table 12. ANOVA testing results H2

ANOVA ^a						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	436.720	1	436.720	1609.308	.000 ^b
	Residual	162.280	598	.271		
	Total	599.000	599			

a. Dependent Variable: Attention Span of student
 b. Predictors: (Constant), Teaching methods used by teacher

The data from Table 9 provides ANOVA results for hypothesis H1, indicating a significant relationship between students' abilities and their attention spans. A highly significant F-value of 1218.611 (with $p < 0.001$) confirms the robustness of this relationship, emphasizing the critical role student abilities play in influencing their focus.

Table 10, pertaining to hypothesis H2, reveals the impact of different teaching methods on students' attention spans. Game-based learning emerges as a highly effective method, with an overwhelming 91% of students (combining those who agreed and strongly agreed) acknowledging its positive influence on their attention. Similarly, hands-on activities and interactive discussions are favored by a significant majority. Contrastingly, lecture-based learning and the use of audio-visual aids garnered mixed reviews, with around 42% of students expressing neutral or negative sentiments towards the latter, indicating possible room for improvement or reconsideration of their deployment.

The Model Summary in Table 11 highlights a robust

correlation ($R = 0.854$) between teaching methods and students' attention spans. With an R Square value of 0.729, approximately 72.9% of the variation in attention spans can be attributed to the employed teaching methods. This finding is substantiated by Table 12's ANOVA results, showcasing a significant F-value of 1609.308 (with $p < 0.001$). The data underscores the pivotal influence teaching methodologies exert on students' attention spans. It suggests that incorporating more interactive and immersive techniques like game-based learning might enhance student engagement and attentiveness.

7.6 Hypothesis testing of Teaching Methods and Attention span of students

H2: There is a significant relationship between teaching methods used by teachers and attention span of student

In the above regression table, the R value is 0.854 that reflects that there is a strong relationship between the teaching methods used by the teachers and the student's attention span where the r^2 value is 729 so research can

conclude that 72.9% attention of students due to the teaching methods used by the teacher Where are 28% The Other factors are responsible for the student attention span In the above ANOVA table, the significance value is 0.00 that is lesser than 0.05 So it can conclude that null hypothesis is rejected where us alternative hypothesis is accepted so the there is strong relationship between the teaching methods used by teachers and attention span of the students.

7.7 Hypothesis Testing of Environmental Factors and attention span of students

H3: There is a significant relationship between surrounding or environment and attention span of student In this above regression model summary the are value is 0.904 where is the R square value is 0.818 through the R value we can say there is a very strong relationship between these two factors which one is environmental factors and the attention span of the students according to R square value which one is 818 so we can say that

attention span of the students is 81.8% is affected due to the environmental factors where is 18.2% are the another factor is responsible for the attention span of the student.so according to this ANOVA table, the significance .000 which one is lesser than 0.05 So we can say that null hypothesis is rejected at 95% of significance level whereas the alternative hypothesis is accepted so we can conclude that there is significant relationship between the environmental factors and attention span of the students.

After analyzing all three Independence variable such as students’ abilities, teaching methods used by the teachers and the environmental factors. The most important factor in this study is environmental factor. Students’ attention towards the studies and the other activities are affected by the environmental factors or we can say the surroundings of that particular student.

Table 13. Environmental factors and attention span of students (N=600) H3

Environmental Factors	Influence on attention span of students (%)				
	Strogly Agreed (5)	Agreed (4)	Neutral (3)	Disagreed (2)	Strongly Disagreed (1)
Peer group	25.33	32	15.33	18	9.34
Family support	44	42.36	3.64	4.33	5.67
Role of mentor and teachers	25.33	39	8.33	12	15.34
Physical environment like noise level, lighting, temperature	30	34.33	11.33	11.67	12.67
Amount of positivity in the surrounding	41.33	32	10.67	10.67	5.33

Table 14. Model Summary for H3

Model Summary									
Model	R	R Square	AdjustedR Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.904 ^a	.818	.817	.42736053	.818	2681.729	1	598	.000
a. Predictors: (Constant), Environmental Factors									

Table 15. ANOVA testing results H3

ANOVA ^a						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	489.783	1	489.783	2681.729	.000 ^b
	Residual	109.217	598	.183		
	Total	599.000	599			
a. Dependent Variable: Attention Span of student						
b. Predictors: (Constant), Environmental Factors						

The data presented in Table 13 casts light on the profound influence of environmental factors on students' attention spans. Among these factors, 'Family support' stands out with a striking 86.36% of students (combining those who strongly agreed and agreed) acknowledging its crucial role in maintaining their focus. The 'Amount of positivity in the surrounding' is another influential factor with 73.33% students resonating with its positive impact. Notably, the 'Role of mentors and teachers' and 'Physical environment' factors also gathered a considerable consensus, emphasizing the need for constructive mentoring and a conducive learning environment, respectively.

The Model Summary in Table 14 exhibits a strong correlation ($R = 0.904$) between environmental factors and attention span, suggesting a significant association. The R Square value of 0.818 implies that approximately 81.8% of the variation in attention span can be attributed to these environmental elements. This interpretation is solidified by the ANOVA results in Table 15, which depicts a highly significant F-value of 2681.729 ($p < 0.001$).

In essence, the data accentuates the significance of external factors in shaping students' concentration levels. Positive familial support, conducive physical environments, and motivating mentors and teachers emerge as linchpins in enhancing student attentiveness. The findings beckon stakeholders to consider these dimensions diligently to foster an optimal learning atmosphere.

8. Conclusion

This research aimed to elucidate the myriad factors influencing students' attention spans, a paramount aspect of effective learning. Through comprehensive analysis, it was evident that attention span doesn't merely hinge on innate abilities or individual will, but is an intricate interplay of internal capacities, teaching methodologies, and environmental influences.

The students' intrinsic abilities, notably self-discipline and critical thinking skills, manifested strong correlations with their attention spans. However, teaching methods employed by educators equally stood out as paramount influencers. Game-based learning, hands-on activities, and interactive discussions were particularly impactful, highlighting the efficacy of active engagement over traditional lecture-based approaches.

Yet, among all these variables, environmental factors emerged as the most potent determinants of attention spans. The irreplaceable role of family support, the significance of a positive ambiance, and the importance of nurturing mentors underscored the criticality of holistic learning environments. The classroom's physical conditions, often overlooked, were also underscored as key to fostering optimal concentration.

In summation, attention span, a cornerstone of academic achievement, is a multi-faceted attribute.

Enhancing it requires a comprehensive approach, encompassing not just pedagogical strategies but also a thorough understanding and optimization of the environmental factors encircling a student. This research underscores the imperative of a synergistic approach, involving educators, families, and policymakers, to create an ecosystem conducive to sustained and effective learning.

In conclusion, the COVID-19 Pandemic appears to have had a negative impact on students' attention spans since students are not engaged during courses and there was a change in the method of teaching. This study is purposeful in identifying the issues that today's students and educators confront, and practical implementation of the theories and elements mentioned here to devise strategies for addressing those issues.

Students' low attention spans might be attributed to a number of causes. Only three were investigated here, but the author found that they all had some bearing on students' ability to focus. Students' ability to concentrate is typically hindered by things outside their control. To increase students' ability to remember what they've learned and pay attention in class, it's important to address the environmental factors that have the most influence on them. This study is just the first step in a long, uncharted journey to the vast universe of students' attention spans, which is a major cause for concern in the field of education.

9. Suggestions

There were several approaches that could be taken to solve these issues; one suggestion is to spend more time in class talking about the most relevant topics. The learner is motivated to pay attention because they know that they will benefit from the repetition of key concepts. In order to digest information effectively, it is important to minimize information overload and to limit the quantity of information sources available at any given time. This would force them to pay attention to only one information source. Students can see significant gains in their academic performance by regularly practicing these solutions. Furthermore, these solutions will only be effective if there is a collaborative effort on the part of students and educators.

10. Limitations

The degree to which teachers and students work together to eliminate inattention is crucial to the success of these strategies. There will be no way to achieve the intended consequences if one side or both are left undisturbed. The reliability of the instructional materials presents another barrier to a complete resolution of this issue. More research covering larger areas is required.

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