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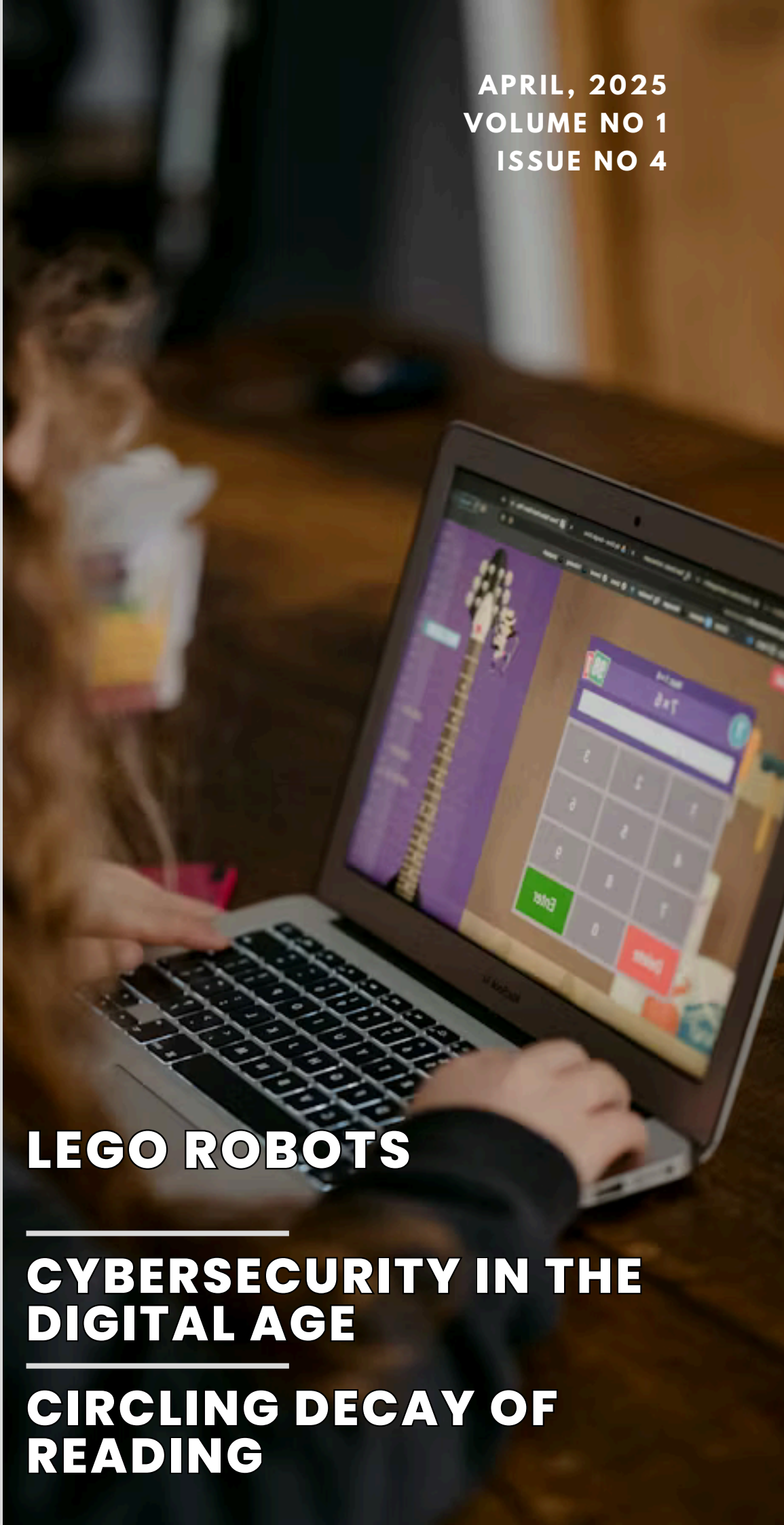

LEGO ROBOTS

CYBERSECURITY IN THE DIGITAL AGE

CIRCLING DECAY OF READING

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Building Tech Skills Before College

A Look at Pre-University Ed-Tech Resources

Aranya Ghosh, TechSphere Insights,
April 2025, Volume 1, Issue 4, pp. 4–11.

Introduction

In the ever-evolving digital landscape of the 21st century, high school students need to keep themselves up-to-date and learn useful tech skills. Technology is used in every field today, be it science, agriculture, transportation, education or any other field. Students with prior digital knowledge and tech skills get an upper hand against others when they join college or go for higher education. A report by Mercer-Mettl reveals that only 42.6% of Indian graduates were employable in 2024. The main reason behind this is the lack of employability skills in today's youth. To survive the tough competition, it becomes necessary to develop tech skills at the earliest.

The easy access to education technology at an early age has made students curious to learn more and develop tech skills from a young age. Nowadays, students can learn courses like digital marketing, graphic design, web development, and cybersecurity even from the comfort of their homes. These skills can help them develop their start-up as well as get jobs. Over the years, due to developments in the ed-tech industry, students are becoming more reliant on free education resources on the web instead of schools or other institutes. Cloud-based development environments like Gitpod, GitHub Codespaces, and Microsoft Visual Studio allow students to experiment with programming languages without any expenses. Online platforms and coding

academies enable any enthusiastic learner to start building tech skills at their own pace and time. Furthermore, online internships help them refine and utilise their skills. Educators and parents are increasingly recognising the role of pre-university technological skills and encouraging students to learn them.

How did Ed-Tech come up?

Integration of technology into education, often referred to as Ed-tech, is not a very recent concept. It can be traced back to the 20th century when audio-visual aids like projectors and educational television programs were introduced in classrooms. However, Ed-tech gained momentum in the 1980s with the invention of the computer. Since then, computers have been used to aid the traditional way of learning in a lot of ways. The rise of the internet in the 1990s was a pivotal milestone in the Ed-tech sector. The Internet provides people with endless resources and information. People could now educate themselves on a variety of subjects just with the help of their computers and the internet. Over the years, online learning tools and virtual classrooms have evolved, making it possible to deliver lessons and resources to remote locations. The University of

Phoenix 1989 became the first in the world to open an online collegiate institution, offering both bachelor's and master's degrees.

The COVID-19 pandemic in 2020 acted as a catalyst for Ed-tech, as education in schools and colleges across the globe shifted to an online mode. The whole pandemic period, lasting for two years, saw a massive increase in the use of video conference calling platforms like Zoom and Google Meet. Thus, the world saw a huge development in the education technology sector. Numerous online educational institutions like Byjus, Physics Wallah, Vedanta, and Unacademy gained popularity. Even when the world came back to a normal routine, online education and technological advancements in educational fields did not cease. Rather, people got used to the comfort and flexibility of education technology and adopted it in their daily lives. A survey by Brainly in 2022 reveals that over 70% of Indian students preferred digital learning platforms over physical classrooms.

Tech Skills to Build Before College

Programming: Programming is giving the computer instructions in the form of code to perform tasks. It is the backbone of technology as apps, websites, and software are built by using programming languages. Mastering programming languages like C++, Python, and Java helps us to explore areas like website and app development. Students should learn programming, even if they want to pursue any non-technical career, as it boosts logical thinking and problem-solving abilities. Knowing coding before joining college helps us stay ahead of our classmates and grab good placement opportunities. In today's tech-driven world, programming is a very valuable skill, especially for tech enthusiasts.

Web and App Development: Web development involves building sophisticated websites and web applications. Creating appealing mobile applications comes under app development. By gaining expertise in programming languages, students can design their websites, develop applications, games or even their start-up. Technical skills like proficiency in JavaScript, Java, HTML, and CSS are crucial to become a web or app developer. High school students can easily learn web development from free resources like YouTube or other ed-tech platforms.

Cybersecurity or Ethical Hacking: Protecting networks, systems, and data from malevolent attacks and illegal access is the main goal of cybersecurity. Learning cybersecurity helps students to secure their personal data and online activities, avoid fraud and cyberbullying. Moreover, mastering cybersecurity and ethical hacking at a young age opens up high-demand career opportunities. A good command of programming languages like C, C++ and Python is essential for this field. Several Ed-tech platforms offer courses in ethical hacking and cybersecurity. websites like Udemy, Coursera, Cybrary, and TryHackMe are widely used by students.

Graphic Designing: Using typography, colours, and images, graphic designers create visually appealing materials such as posters, brochures, logos, and book and magazine covers. Platforms like Adobe Photoshop and Canva are some mainstream platforms for graphic design. Graphic design is also valuable for students who want to pursue careers like marketing, UI/UX design, web design, and content creation. Using education technology, enthusiastic students can learn this skill for free at home.

Student-friendly Ed-Tech Platforms

Coursera: Coursera is an online learning platform based in California, US. This software offers a range of certificate courses from top universities like Stanford, Harvard, and MIT in fields like programming, data science, and AI. It is popular among pre-university students as it offers beginner-friendly content in a flexible learning schedule. The interactive quiz sessions, real-world projects, and global accessibility in different languages make learning fun and easy for students.

edx: EDX collaborates with over 160 universities and organisations worldwide to provide students with the best instructors in their respective courses. The futuristic courses they provide on AI, machine learning, data science, and cloud computing benefit students and help them to prepare for competitive college programs and future careers in tech. To ensure inclusivity, edx provides courses at an affordable rate or even free of cost.

Khan Academy: Khan Academy is a non-profit organisation providing lessons on various topics for free. Courses on JavaScript, HTML, CSS, and SQL help students to become web developers without any formal degree. Pre-university learners benefit from their easy-to-understand content sitting in their homes. With pre-recorded video tutorials, students can learn useful skills whenever and wherever they want.

Apna College: Apna College is an Indian ed-tech start-up to help students crack good placements and internships. University as well as pre-university students benefit from their free YouTube tutorials and lessons on C, Python, Java, Machine learning, and AI. Along with free YouTube videos, Apna College also has paid online batches called Alpha, Delta and Sigma, teaching DSA and Web Development. Apna College also motivates pre-university students to choose a career path in technology and helps them by providing guidance and mentorship.

Codecademy: Codecademy provides interactive coding lessons for beginners, covering programming languages like Python, JavaScript, Java, app development, web development and machine learning. Pre-university learners can work on small projects, track progress, and earn certifications from

Codecademy. Their structured coding courses, divided into bite-sized lessons, help students learn coding fast in a fun-filled way.

Mark Zuckerberg: The Role of Early Tech Skills in His Journey to Success

Mark Zuckerberg, the co-founder of Facebook and one of the most influential tech entrepreneurs of the 21st century, began his tech journey at a very early age. In his childhood, Mark was a curious child obsessed with video games. When all his friends played video games just for fun, he would try to understand how they worked and even wanted to create them on his own. Understanding Mark's curiosity and interest in technology, his father bought him his first computer, the Quantex 486dx. They even hired David Newman, a private tutor, to teach him programming.

At the age of 12, Mark found out that his father, a dentist, was looking for an easier way to contact his receptionist in the office downstairs without moving from his chamber. That's when he put his coding skills to the test and built an instant messaging platform- Zucknet. The program allowed seamless communication over short distances.

Mark's passion for technology never ceased; rather, it grew stronger as he grew up. In high school, he created video games for fun. He also built music streaming platforms called Synapse, similar to today's Spotify. During his second year at Harvard University, Mark Zuckerberg and his few friends created Facemash, a dating platform exclusively for Harvard students. Over time, its popularity grew and spread to other colleges as well. Understanding the potential of Facemash to be a global platform, he and his friends dropped out of Harvard to focus on their start-up. Facemash evolved into Facebook, the most popular social media platform within years.

However, the life of Mark Zuckerberg highlights the significance of nurturing technological skills at a young age. His story motivates students to embrace technology with curiosity and never stop learning. We do not need to wait for university to learn and use technology. "The best time to start was yesterday. The next best time is now." With the rise of education technology, it's easier nowadays to start building technical skills before college. We should make the best use of that opportunity and prepare ourselves for a tech-driven future.

Can EdTech Promote Better Mental Health?

The Science Behind Wellness-Focused Learning Tools

Neha Fatima, TechSphere Insights,
April 2025, Volume 1, Issue 4, pp. 12–20.

Introduction

In the ever-evolving digital landscape of the 21st century, high school students need to keep themselves up-to-date and learn useful tech skills. Technology is used in every field today, be it science, agriculture, transportation, education or any other field. Students with prior digital knowledge and tech skills get an upper hand against others when they join college or go for higher education. A report by Mercer-Mettl reveals that only 42.6% of Indian graduates were employable in 2024. The main reason behind this is the lack of employability skills in today's youth. To survive the tough competition, it becomes necessary to develop tech skills at the earliest.

The Mental Health Crisis in Students

Mental illness among the youth has witnessed a steep rise in the last few years. The pandemic of COVID-19 increased the issue, disturbing school schedules and restricting socialisation opportunities. In an article published in Cureus in 2024, students who transitioned to online education demonstrated increased rates of depression, anxiety, and stress due to increased screen time, discontinuity, and isolation.

But this very same report revealed that other students were achieving emotional stability through the help of helpful online resources, i.e., mental and physical well-being apps and telecounseling. This implies that EdTech isn't the culprit itself; the way we plan and implement it is critical.

As we travel along the ever-evolving landscape of EdTech, it is vital to look into its evolving landscape, not only about learning results but also regarding the emotional and psychological lives of students. We need to look into the way wellness-focused educational materials are authored, taught, and put to use in actual learning environments if we want to fully comprehend this dynamic.

EdTech and Mental Health: Power of Transformation

1) Improved Access to Mental Health Care: Several EdTech platforms currently offer integrated wellness solutions such as emotional well-being apps, mindfulness practices, and virtual counselling services to significantly expand access to mental health services. For example, the platforms such as Calm Classroom and Headspace for Educators are designed to promote mental well-being through meditation, breathing exercises, and stress-reduction strategies. Regular use of these methods can decrease anxiety and improve emotional regulation, especially among frazzled students, research says. Studies have shown that mindfulness and meditation practices can make students less depressed and anxious, providing a good scientific justification for incorporating these practices into educational systems.

2) Personalised Education and Its Effect on Mental Well-being: EdTech's ability to customise the learning experience for each student is one of its principal capabilities. By tailoring courses to each learner's advancement, adaptive learning tools like Khan Academy and Duolingo reduce the stress that

often comes with traditional one-size-fits-all instruction methods. These tools lower stress and facilitate a positive learning attitude by allowing students to learn at their own pace. Along with enhancing academic performance, individualised learning enhances emotional well-being by reducing frustration or inadequacy. Personalised learning materials have also been seen to enhance the self-efficacy of learners, which strongly corresponds with improved mental health.In addition, by allowing learners more autonomy and meaningful choice about how to learn, personalised learning significantly promotes social-emotional development. Adaptability leads to inner motivation, control of feelings, and understanding oneself. Much EdTech utilises performance-based activities that favour mastery and utility over mere normal modes of evaluation. This aids in lessening test anxiety and encouraging a stronger connection with learning. By redirecting the teacher's role toward emotional support and mentoring—two critical elements in building trust and a sense of strong belongingness among students—these methods assist in enhancing the relationships between teachers and students.

3) Social-Emotional Learning (SEL) Integration in EdTech: EdTech platforms are quickly integrating Social-Emotional Learning (SEL) programs, which educate students to identify and manage their emotions. The mission of such programs as ClassDojo and Emote is to improve students' social and emotional abilities through giving them in-class, interactive, and interesting features, along with instant feedback. Developing emotional intelligence, empathy, and resilience are all integral parts of mental well-being promoted by such sites. Over and over again, research proves that SEL programs enhance children's ability to create healthy social connections, reduce behavioural problems, and enhance emotional regulation. Ultimately, this leads to improved classroom

conditions and mental health outcomes. Strong evidence supports SEL helping create mental wellness within schools, according to the Collaborative for Academic, Social, and Emotional Learning (CASEL).

4) Virtual Counselling and Teletherapy: A Student Support Game-Changer With the increasing popularity of telemedicine, virtual counselling services have become a vital component of EdTech that works towards enhancing the mental well-being of students. Today, school wellness programs often include platforms such as Therapist Aid, BetterHelp, and Talkspace, which provide children with safe, online access to licensed mental health professionals. Classic in-person counselling frequently lacks the intimacy, convenience, and adaptability that these services possess; this is especially important for adolescents who may be hesitant to seek assistance face-to-face. Students are motivated to receive treatment when they need it most due to the anonymity and convenience, which de-stigmatises conversation regarding mental health. The advantages of virtual therapy in the education system continue to be validated by scientific evidence. A 2024 study that was sponsored by the National Institutes of Health (NIH) and published in the Journal of Global Health found that digital mental health interventions greatly enhance teenagers' psychological outcomes. According to the study, teletherapy frequently works equally as well as in-person counselling, particularly when it comes to treating stress-related disorders, anxiety, and depression in students from underserved or rural areas1. Using teletherapy, students can engage with mental health professionals in a relaxing, high-tech environment, improving the availability, consistency, and efficacy of assistance.

Challenges of EdTech on Mental Health: Possible Pitfalls

As we've observed, EdTech tools offer a multitude of benefits, ranging from convenient virtual therapy to SEL integration and individualised learning. By making learning more student-focused, emotionally supportive, and cognitively challenging, these resources are transforming education. The growing dependency on online media does, nevertheless, carry some challenges that should not be underestimated, as would be the case with any large innovation.EdTech encourages scholastic and emotional development but can also yield unintended consequences, especially regarding psychological and physical well-being, if done improperly or even abused.

1) Increased Screen Time and Its Detrimental Consequences: The rise in kids' screen time is one of the most pressing concerns in the era of online learning. Students today spend more time in front of screens than they ever did due to interactive apps, virtual classrooms, and constant notifications. This constant digital engagement can be counterproductive despite keeping learning steady. Several physical and psychological ailments, such as digital eye fatigue, disrupted sleep, increased irritability, and long-term fatigue, have been immediately linked to prolonged screen viewing. During the COVID-19 pandemic, this issue was most evident. Students felt more depressed and anxious due to the transition to online learning. In a recent study, children and adolescents who spent more time on screens were far more likely to have mental health problems such as mood swings, lack of motivation, and loneliness.

   Research highlights the importance of using technology in moderation. Digital device overuse can interfere with executive functioning and emotional control, particularly among younger students, based on one comprehensive review. Prolonged screen use has also been connected

with lower grades and increased amounts of stress due to overstimulation and insufficient physical activity, based on another piece of research3. Such outcomes suggest that even though EdTech tools are manifestly beneficial, digital wellness lessons need to be employed in their use. Their risks of increased digital exposure may be mitigated by creating such healthy boundaries like restricting screen hours per day, taking regular offline breaks, and encouraging outdoor activities. Towards creating a sustained, well-stabilised ecosystem of learning, EdTech industry players and schooling institutions alike should integrate these strategies into their sites and courses of study.

2) Digital Divide and Inequitable Access to Mental Health Services: EdTech can improve the well-being of students, but it also highlights an emerging problem: not all students have equitable access to technology. For most students, especially those in low-income or rural communities, the benefits of educational materials are restricted by the digital divide, which is founded on socioeconomic disparities. These children stand to be locked out of online studies and mental wellbeing programs if they lack access to digital equipment or reliable internet. They are hence likely to feel stressed, anxious, and isolated in return. The impact of digital inequality on the mental well-being of students is brought out by studies. Students with restricted access to technology during remote instruction were more likely to feel emotional discomfort and disengagement, as per a study published in Discover Education.

3) Privacy and Data Security Concerns: Data security and privacy concerns are becoming increasingly prominent as EdTech platforms are being integrated more extensively into students' learning environments. Several of these technologies are accumulating a large amount of private data,

like habits of learning, emotional response, and even markers of mental wellness.

Pupils and parents can start worrying and feel distrusted if that information isn't properly shielded. Data privacy in educational environments is a critical element of mental well-being in EdTech systems, as the National Research Council and Institute of Medicine have stated that safe and emotionally secure environments are crucial for children's and adolescents' healthy development.

The Science Behind Wellness-Centric Learning Tools

1) Mindfulness and Cognitive Behavioural Science: EdTech well-being-oriented learning materials often include mindfulness and cognitive-behavioural science (CBT) principles. By promoting awareness and acceptance of one's thoughts, mindfulness activities are designed to help students cope with stress, anxiety, and emotions. These concepts are employed by sites such as Calm and Headspace to guide students through meditation practices that promote emotional regulation. Scientific Foundations: Studies have proven that mindfulness-based interventions enhance the overall well-being of students by reducing symptoms of anxiety and depression. These materials have a scientific basis due to research indicating how effective mindfulness is in improving mental health.

2) Biofeedback and Emotion Recognition Technology: Biofeedback and emotion detection technologies are also integrated into sophisticated EdTech platforms. These devices employ sensors to monitor physiological responses, like skin conductivity or heart rate, to measure students' emotional states and provide them with instant feedback on their stress levels. This data-driven approach helps students manage and comprehend their emotions more

effectively. Through education in regulating body responses to stress, biofeedback has been demonstrated as an effective tool in reducing stress and anxiety. Emotion recognition technology helps reveal details of emotional wellness, allowing quick actions when required.

CONCLUSION

If used carefully, EdTech can be an effective tool to encourage students to have better mental health. Mental well-being can be enhanced significantly by education resources centred on wellness, such as virtual counselling services, SEL programs, and mindfulness applications. With that said, challenges such as privacy issues, digital injustices, and screen time must be managed carefully. EdTech is an essential component of modern education because it has the potential to greatly enhance students' mental well-being by integrating evidence-based practices and leveraging the science behind wellness solutions. Teachers, lawmakers, and mental health professionals must collaborate as the field evolves to ensure that EdTech addresses students' emotional and psychological needs as well as their cognitive ones.

Circling Decay of Reading

E-Books Versus Print Books in the Digital Age

Soumya Vartika, TechSphere Insights,
April 2025, Volume 1, Issue 4, pp. 21–29.

In a world where swipes have taken the place of page turns and the screen glow fights against the rustling of paper, reading is standing at an unprecedented, strange intersection. Once a cherished ritual, curling up with a good book, feeling the texture of the pages, and melting into another time and place, today reading is more akin to evolution some would claim-into gradual extinction. The present digital age has redefined not just how we read but the soul of reading itself. E-books have made reading convenient, cheap, and portable, and in this regard, normal print books are engaged in an uphill fight to stay relevant. But is this transition a natural movement or gradual corrosion of the deeper meaning of reading?

This discussion has erupted beyond mere preference into the realm of an encompassing cultural shift. In as much as screens are diminishing the tactile pleasures of print into dulled obsolescence, digital media dominates their very existence. The accessibility of e-books is paramount for many. Where one device allows for the substitution of dozens of tomes, a flick of the finger visits a library from Shakespeare to science fiction. Built-in dictionaries, adjustable fonts, and even text-to-speech systems are all part of the package. For the digital native, this is not innovation; it is emancipation.

However, loss will surely be amongst the mourned for those bibliophiles and purists. The smell of a new book, the marginal notes scrawled in pencil, and the delight of seeing one's progress through a physical stack of pages are forever lost. Research shows that reading print might enhance understanding and retention as the physicality of the medium engages the brain differently. Beyond function, print brings an emotional aspect to reading that e-books can scarcely imitate.

More worrying than the war over formats is the slow realization that reading itself is dying. Attention spans are contracting, distractions in digital form are increasing, and deep reading—the kind that cultivates critical thought and empathy—is becoming rare. The question is no longer, will e-books ever take over print? Rather, will either survive in a culture inundated by vexingly bite-sized content, instant satisfaction, and endless scrolling?

Once Upon a Page: A Timely Journey

Do you remember the crackle of the spine of a new book? The fresh, slightly wooden smell of inked paper; the thrill of turning pages late into the night under the glow of a warm reading lamp? In contrast, today, there are a thousand novels in your back pocket, softly glowing from the screen of your phone or e-reader. The great tug-of-war between print books and e-books has formally begun in our generation.

Indeed, quite a debate is stirring the hearts and minds of bibliophiles, technophiles, and complete laypersons who hang out in bookstores where e-reading is concerned. Now that the digital age is turning pages on traditional reading, one begins to wonder: Would pixels replace paper? Or is there space for both on life's proverbial bookshelf?

The Rise of the Digital Book

The brilliant novels we behold today were never so blissful in their presence. The e-book, if one must call it so, kicked off on its bumpy path in the 1970s with Project Gutenberg, the first digital library with an aim to digitize and archive cultural works, initiating them into a realm accessible to mankind. E-books did not make a grand entry into the world until the mid-2000s, the period with the emergence of the Amazon Kindle and Apple's iBooks.

The major e-readers turned a whole new page in book reading, providing instant access to millions of titles, adjustable font sizes, built-in dictionaries, and the ability to carry an entire library in one device. This revolutionary change is suited differently for the world traveller, student, or minimalist. The full scoop: lean, green, and just walk in.

"I love that I can highlight, take notes, and sync my books across all devices. It's made academic reading so much easier."

But like every revolution, some stood in its way.

The Loyalists of the Page

There is something about print books that no screen can replicate. There is something romantic about that turning of pages, the heft of a hardcover, the fading ink on an old paperback's yellow pages. Book lovers talk about their collections like old friends, proudly displayed on shelves like trophies of lived stories.

"There's something sacred about holding a book, It's like having a piece of history in your hands."

Research backs this loyalty, too. Studies show that readers retain more information from print books than from their digital counterparts. The tactile flipping of the page and absence of screen glare are great for focus and comprehension. And let's not forget the joy of gifting a beautifully bound book with personal notes written in the margins.

So, while e-books raced ahead with all their innovations, print books held their own with soul.

The Great Debate

Who's winning: Team E-Book or Team Print?

Surprisingly neither. Or rather, both are winning.

Despite fears that e-books would spell the doom of printed literature, the two have found a strange harmony. Print books still rule the roost when it comes to sales, especially in genres such as children's literature. They say e-books would doom printed literature, yet the two exist in some strange harmony. Print books, particularly children's literature, academic textbooks, and coffee table books, still reap most sales. In contrast, e-books thrive in niches where readers gobble up romance, sci-fi, and thrillers by the series.

Audiobooks, too, have joined the fray; they provide an opportunity for story time while driving and doing chores. The modern reader doesn't belong to one side or the other- they choose a format of convenience based on context and mood.

"I love switching between Kindle and physical books. E-books are great for travel, but nothing beats curling up with a paperback on a rainy day."

The Self-Publishing Boom and Indie Authors

E-books have democratized the know-how of publishing in one of its greatest gifts. In its way, aspiring authors no longer feel the need to break into the frequent gates of conventional publishing. Such sites as Amazon Kindle Direct Publishing, Smashwords, and Wattpad allow writers to reach their readers directly.

Some genres, like romance, fantasy, and erotica, thrive in the indie space, where authors get to self-publish their works almost immediately in a very aggressive manner. A good number of today's bestsellers began as self-published e-books.

While print books still carry a certain prestige, digital platforms are winning in the arena, giving new voices a world stage.

Reading in the Time of TikTok

Entered #BookTok, the social media phenomenon renewing Gen Z's reading passion. One viral video can make or break any title, regardless of the format. Young readers are just as likely to buy a paperback from a quaint bookstore as they are to download it right onto their phone.

Digital platforms have offered literature equal chances; self-published authors can find readership without the need to ever go to print. Fanfiction thrives online, so many become published. Reading stopped being a solitary act; it is now a shared experience, a hashtag, a community.

Yet, there have been many indie bookstores that are undergoing this new creativity, all things cozy, stocked with coffee smells and curated collections for readers bored by too much screen time.

"I found my favourite fantasy series thanks to a BookTok recommendation. Now I own the whole set—both Kindle and hardcover!"

Libraries in the Digital Age

Historically, libraries have always been the heart of access to literature. They, too, are changing alongside the times. They now provide digital lending through applications like Libby and Overdrive. Borrowing e-books and audiobooks is now instant and available anywhere with just a library card.

Indeed, this transition has meant a great deal for libraries during these times, especially in regions that have not been served well enough and where there is hardly any physical access to books. Still, though, we have found that libraries are indeed havens on pretty much any given day for the quiet thought and discovery that reading rooms with children's story time and book clubs provide to keep the community spirit alive.

"My local library's digital collection saved me during lockdown. I discovered my love for reading from my phone."

The Future is Hybrid

It seems increasingly clear that reading's future will not be an either-or. Rather, reading's future lies with both: the two are going to form a blend in children's reading today.

The technology giants are busy experimenting with live reading pop-up books for AR kids, interactive fiction, and even AI-narrated stories. Simultaneously, we are seeing a renewed call for slow reading, journaling, and some more analog rituals.

In schools, these different formats are being applied to accommodate varied learning styles. In publishing, increasingly, authors of books will launch a title in all formats as the releases happen. Home is again not the exception; you'd see a Kindle flaunting beside MacGregor's dog-eared novels.

"My morning starts with reading an e-book on my phone during the daily commute, followed by a paperback before going to bed. Best of both worlds."

It has changed the way we experience life, yet within this change still appear the traditionities: stories, imagination, and the power of words.

Long Live the Book

It doesn't matter whether you are a sniff-it-up person or a scroll-it-down screen scroller, a hardcover collector, or curator of a cloud library: the one thing everyone is sure about is that reading is here to stay. Reading is becoming bigger, flourishing, evolving, and spreading more than ever before.

And when next you settle down with a good book, try asking yourself- not what you're reading, but how you're reading it. The magic might differ, but it pretty much remains eternal.

Long live the book in all its forms.

At the turning point between heartbeats, the tussle continues in an impetuous romance between digital and print books. The digital age has transformed the experience of how we consume content, which raises an aspect of what actually would be required for deep attention and emotional ties formed in our experience of written words. Rather than its extinction, we witness reading evolving. But before that great event solidifies, there has to be a balance for its richness- the digital-to-learn-to-draw from their base source, not to imagine a world in which screens overshadow the experience and joy of pages. And in our circling decay, let us not mourn the passage but shape it- it welcomes both formats and refreshing the zeal for all its manifestations of complete, wrapped-up, involved reading.

Cybersecurity in The Digital Age

How safe is our data?

Rashika Shaw, TechSphere Insights,
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Introduction

Today, we are living in the digital age, which is also characterised by the widespread use of digital technologies such as the Internet. The internet has transformed the way we work, live, access, and communicate information. Feeling bored? just say hi! to your friend on a Messenger. Want to eat? order food online through Swiggy or Zomato. Don't have the cash to pay, use online payment apps such as Google Pay and PhonePe to make payment, and even when we are looking for trendy, fashionable clothes, we go to e-commerce apps such as Amazon to buy fashionable clothes for ourselves. Things have changed very rapidly; the Internet has given us the privilege to get things at our convenience with just one click. However, alongside these conveniences comes a growing area of concern: the way we share our data online. The global indicator reported that 'the estimated cost of cybercrime' in the cybersecurity market is predicted to increase between 2024 and 2029 by 64.91% consistently. From entering our location, contact details, payment information, and personal data online. We are constantly sharing our data without even realising what if it gets leaked or falls into the wrong hands. The European Union data privacy authorities fined Meta around $ 263 million for the 2018 data breach in which 29 million accounts were compromised. Another example of cyber threats that can also happen without someone sharing their information is E-mail hijacking. Email Hijacking is one way where fraudsters trick users into disclosing confidential information by directing them to any link; this is called a phishing attack in the cyber world. Cybersecurity is the process that is utilised to protect

computer systems, networks, and data from unauthorised access. The present article is going to discuss in depth the types of cybersecurity, its role in securing our data, and the evolving future of Cybersecurity.

The digital footprint we leave behind

Digital footprint refers to the record of all the online activities of a person and their interaction action online. It is the collection of all the digital points that are left behind as a part of someone's digital actions. It can be passive as well as active; passive means the data that is collected by online websites and online services. For example, the online profiles that commercial parties create to analyse the browsing behaviour of consumers to sell the data and showcase ads based on their interests. The active digital footprint means the content created by a person and shared on different digital social media platforms, such as Facebook or Instagram. In the world of cybersecurity, this is also called a cyber footprint. It has been found that, on average, users spend 6 hours of their day on the Internet, while 60% of the total population uses the Internet. Cybercriminals use the digital footprint of the organisation to create convincing phishing emails. For example, sometimes hackers use spoofing techniques to collect the email addresses of any employee and trick them into revealing important login credentials.

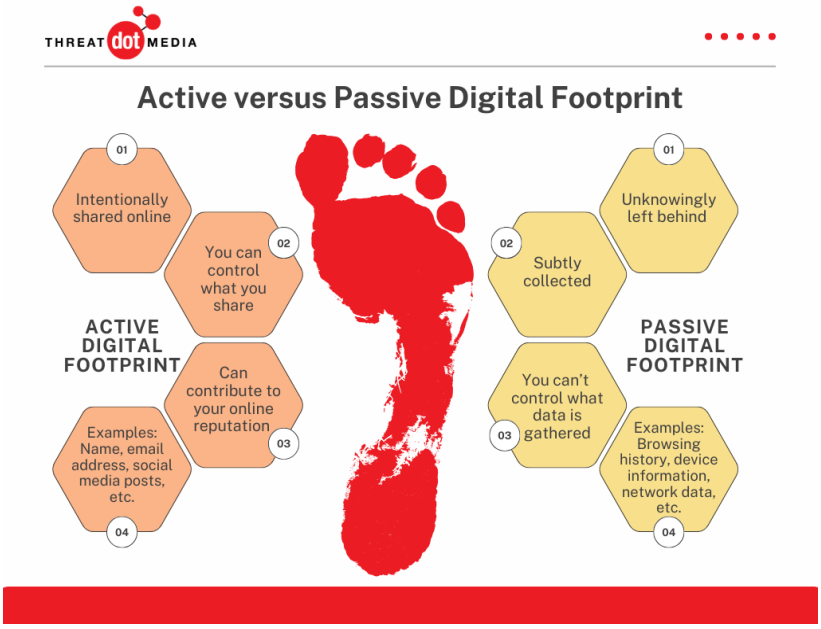


Figure 1: Digital Footprint

Different types of Cybersecurity threats

1) Identity Thefts: In a report published by the Identity Theft Resource Centre, 78% of identity thefts are attributed to job scams and scams in 2023. Identity theft is an illegal act in which a scammer steals important information, including name, email, phone number, or Password, without consent and uses it to obtain financial gain. One example includes unexplained credit card bills or new credit cards issued in a person's name that they did not apply for. Anyone can be a victim of identity theft, but elderly people and children are more vulnerable to this type of attack. This is because, in the case of children, their finances are handled by someone else.

2) Social Engineering Attacks: Spear phishing is a Social engineering attack in which attackers use the activities of a person to trick them. Examples include if a person in a LinkedIn profile shares their interest regarding job roles in social media platforms, the scammers try to manipulate this information to provide fake job offers or click on the link, in which they end up revealing sensitive information that can be used against such as bank account details, OTP. In a report published by IBM, it has been found that phishing is the most common reason for data breaches. The reports of Statista outlined that in a survey report, ½ of the surveyed organisations encountered malware infections on their systems due to spear phishing attacks, while 50% of them witnessed the loss of confidential or sensitive data.

3) Brute Force Attack: In this type of cyber-attack, attackers mainly use a trial-and-error approach to guess the combination of passwords. Examples of this type of attack include recognising weak passwords of any account; it can be perceived as similar to the incident in which hackers try to break the password until they get the right login information. Real examples of this type of attack include in 2016, a popular e-commerce platform, Alibaba, faced this type of attack in which the accounts of 21 million users came at risk. In Brute force attacks, hackers mainly target individuals who use easy passwords or often use the same type of passwords for multiple websites.

4) AI in Hacking: There are instances in which people have shared the sensitive information of their accounts after getting swayed away by the conversation through a virtual assistant. Neural networks in AI are used to recognise passwords. Through the use of Neural networks, hackers are now able to guess passwords easily that look like "passwords". Additionally, sometimes hackers can crack a portion of the password with the help of neural networks.

5) Cyberbullying: Cyberbullying is a type of bullying that takes place over digital devices such as tablets, computers and smartphones. It involves utilising social media, messaging apps, gaming platforms, and online tools to harass, threaten or target another person. One example of cyberbullying is when a person makes a fake profile to impersonate or mock someone. The other example includes posting false or hurtful information about someone else online.

Figure 2: Cyberbullying

Role of cybersecurity in protecting digital data

Cybersecurity is a practice that is designed to keep digital networks, systems, and data safe from unauthorised access. In today's digital world, cybersecurity is just like a lock that keeps your important information can be kept safe and

protected from being stolen, destroyed and misused. We need cybersecurity to protect sensitive personal, financial and business information.

In the above section, we learned about different cyber threats in the digital age and how hackers use basic information to cause financial harm to any individual or big organisation. However, there are some effective cybersecurity methods to ensure our data is secure in the digital age. These are as follows:

Cybersecurity approaches in tackling identity theft

For the cyber-attacks that start through fake emails tricking users into giving away sensitive information, hackers. There are email filters that detect malware, viruses and spam before it lands in users' mailboxes. The report of Statista highlighted that 1 in 6 phishing emails contain dubious attachments to the Department of IT. This phishing not only directs users to download malicious attachments but sometimes also causes fake password reset requests. Thus, not clicking on the link or double-checking before downloading an attachment are ways one can follow on a personal level to avoid becoming a victim of a phishing attack.

Cybersecurity approaches to prevent social engineering

Detecting log-in activity in real-time is one approach that detects anything unusual and reports it immediately. For example, when someone logs into their email account from a different device, the cybersecurity real-time tracking tool tracks this reports this activity to the account holder and asks if the activity was made by them or someone else. When an email account holder gets this message that their account is being accessed by someone in another country, they can either change their password or report it to keep the sensitive information safe.

Cybersecurity Approaches Against Brute Force Attacks

There is no one-size-fits-all solution to the problem of Brute force attacks, but adding multiple levels of security for companies and individuals is the only way to protect systems. We have seen that while making new accounts, we see pop-ups like passwords should be long or add one character, or the password is weak. The goal is to make passwords complex enough to make it difficult to crack by the hackers. Many websites use hashing and salting techniques in which random numbers are added to make passwords difficult to guess, even if the same password is being used in two different places.

Two-factor or Multi-factor authentication (2mfa) is an approach in which an extra layer of security is added to prevent easy access to the financial accounts of the users. This means even if the hacker guesses the password without the second piece of information, it will not be easy for the hacker to log in.

Firewalls are another key defence that spots suspicious behaviour and blocks it from one place.

"Completely Automated Public Turing test (CAPTCHA)", on the other hand, checks whether a login is made by a human or a Bot.

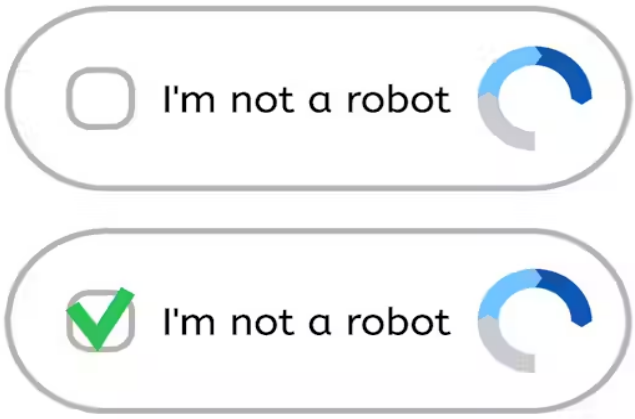


Figure 3: Captcha

AI in cybersecurity

With the nature of cyber threats evolving regularly, the set-it-and-forget-it approach is not going to work anymore. Thus, adaptive defence is an approach that utilises machine learning algorithms to consistently learn from new data and update defence strategies based on evolving types of cyber-attacks. AI adaptive defence approach enables businesses to recognise and stop these attacks through methods such as isolating the system that is under attack, creating effective response plans and applying them, and restoring affected systems through the decryption process.

Cybersecurity approaches to deal with cyberbullying

Reporting and blocking tools are effective features that make it easy for users to report abusive messages or cyberbullying behaviour. Further, the blocking tool enables users to block the bully and limit interaction with the bully. Additionally, in social media platforms such as Instagram and Facebook, there are options such as controlling profile visibility or restricting people from tagging them online. These features help in preventing getting bullied in the virtual world. End-to-end encryption is a method that ensures privacy in conversations between parties, such as WhatsApp. However, WhatsApp also allows flagging selected messages as abusive, even in encrypted chats, by sharing them with moderators.

Are the current cybersecurity practices enough to secure our digital data?

The approaches discussed above definitely improve cybersecurity, but cybercriminals always find new ways to bypass cyber defences. Thus, reflecting upon the question of how safe our data is, the answer is “Our data is safer than before, but never entirely safe”. The technologies, such as Firewalls, encryption, authentication, and AI-powered adaptive defences, significantly make it harder for hackers to succeed. The security of our data significantly depends upon continuous monitoring, regular updates, and awareness of the users.

Securing our digital data in the digital age is not about achieving total immunity from cyberattacks, but practising methods such as thinking before clicking on suspicious links. Additionally, regularly updating software and managing privacy controls on respective apps to improve digital well-being.

How Short-form Videos are Changing Entertainment and News Consumption

Sarthak Kumar, TechSphere Insights,
April 2025, Volume 1, Issue 4, pp. 37–43.

Everyone seeks information and that too in less time, this was made possible by introducing the concept of short-form video formats across YouTube in September 2020 and on Instagram around August in the same year, that delivered content effectively which reduced the time of a 10 min video to just 1 min or say 60 seconds. Now audiences can consume a lot of content across all social media platforms, later this concept was introduced in news sections also which centred only one aim, and that was to keep users on the platform for longer periods and engage them by showing variety of media contents.

But as we know everything that becomes part of our lives has some good and bad qualities in it, short-form video also has its own merit and demerits which we will discuss later in this article but before that we will understand how short-form video became popular, also how's it impacting our mental health , the issue of authenticity in this format , we will also discuss about how news contents have changed in giving information through this process and at last how short contents are going to shape future in this digital world.

Why is Short-form video Popular?:- Shorts have become popular because of numerous reasons such as advanced technology, change in consumer behaviours, short attention span, etc.

Here are some reason that are listed below:

1) Mobile usage: Smartphones have reached almost everywhere, which marks a huge consumption of media contents on the go, like when someone is waiting for bus, train etc. they simply start scrolling through reels, shorts because it has been seen that it's ideal for quick viewings even when you are busy.

2) Enough availability of contents: Nowadays viewers want quick and easily digestible content which best suits especially in short videos, viewers can get all these with number of digital content across one or more platforms.

3) Next up we have creativity and innovation: Viewers wait only on that particular video which they find more innovative, full of suspense and creative also. For this, creators need to record and edit video in an attractive way so as to engage and entertain their audience.

4) Cheap Production:- The best example for stating why short-form videos are popular is its cheap production. After this concept of delivering contents in 60 seconds, recording anything has become very easy. Comparing this to the long-form video where production costs expensive tools. But creating a small size content it requires only a smartphone, an editing app and a good internet connection.

5) Diverse content: Suppose someone is a content creator and makes long-form videos, there he/she is bounded by limited topics which they decide and deliver among there viewers, more or less they create 1 or 2 videos in one week or 5 video's in a month's but on the other hand a short videos creator just need 15 or 60 seconds to tell his information, now this short video creator can easily make 10+ videos in week and 20+ in a month making a diverse range of content on different topics making it sure that audience are engaged for longer periods.

Let's see what are its merits and demerits

Merit's:

1) Quickly viewed and shared along : Viewing a video that is short and contains useful information is likely to go viral by sharing it many times and being a 1 minute or 60 second video it's easy to re-watch a particular part if someone misses out anything important that may help them.

For example:- Suppose someone wants to bake a delicious chocolate cake, for this he/she reaches to YouTube and there finds a video that elaborates the whole baking process in a 10 min video, which they avoid to watch, scrolls down and finds that the same process is explained in a 1 min videos and that too with very easy steps, also if someone misses out any part they can go back and re-watch it, so everyone will prefer watching this and also share in their family group so that everyone can bake it.

2) Quick engagement: Short-form video content is likely to be more engaging than that of long hour videos, shorts grabs viewers attention quickly by delivering information on viewers interest, also it allows them to like, comment, and share the video which makes a higher chance for the audience to engage.

For example:- Someone is watching a travel vlog

there he/she doesn't find any engaging things which can be shared among their friends so that they can plan a trip. On the other hand a video of making maggie is being watched, where it includes like, share, comment option also it's visually appealing nature makes it more engaging than previous one.

3) Relevance: Short videos are focused on a single concept which makes it easy to convey a message. Also viewers wait on that particular video which they find more relevant according to their interest.

Let's take an example to better understand this:- a video giving information about the weather forecast, the viewer finds it relevant and

watch till end to gain all important information about the upcoming weather, like when it's going to rain, what are the preventive measures they should take etc. On the other hand a video showing a cartoon and that might not be relevant to some viewer as a result they will skip the video and look around for such videos that are related to them.

4) Ideal for less time and more information: Short-form video made a great entry by doing two things, first saving people's time and second giving more and more information based on their interest. Also they have more knowledge about the happenings and viral things in the ongoing world.

For example:- in a video that talks about upcoming JEE Mains exams in that particular video information is very concise and up to the mark that saves time, also it guides the viewer to start their preparations ok time.

5) Mobile-Friendly: Short-videos are best suited for mobile phones. Be it anyone, all of us have access to smart phones in which it's very comfortable to watch short-form videos, also if someone wants to watch a short video he or she will not open their TV, Tabs, Laptops, etc. also mobile phones are easy to carry, even when you are travelling or doing anything important you can watch these anywhere anytime.

Now let's talk about some of its demerits:-

1) Addiction of Short-form video: When these short- videos were introduced no one thought that one day large population will start investing their important time in just scrolling through Instagram reels, YouTube shorts etc. Some of the reports say that an average person watch 50+ short videos daily. The Economic Times report says that YouTube shorts have gained immense popularity that almost 96% of the population is addicted to watching short-form videos on a regular basis.

2) Fails in creating long lasting connection: Many of us would have noticed that while watching these short time based contents, people are not able to connect with a particular video for longer periods.

For example:- Someone is watching a motivational video so as to motivate him/herself but after few seconds a sad video comes on their feed which brings the whole motivation to an end leading that person again demotivated. These results in mood swing problems , becoming irritated even on small issues , which slowly impacts their mental health.

Note:- these mental health issues can slowly lead to short time memory loss.

3) Lower retention rates: Short span videos tend to have less retention rates , because a 60 seconds video can't hold viewers attention for too long until and unless the video is Informative, innovative and creative so that the audience can take something with them when they scroll up. Also misinformation, bad video quality leads to less retention rates.

4) Authenticity: Videos that contain sensitive information such as foreign issues, economic updates, political happenings, etc. have high chances of being fake especially in short-form videos formats that are viewed and shared easily. For example: suppose someone plans to visit Kullu Manali on vacation but before going there you searched about the current weather conditions, you found that the video misleads you by giving wrong updates that the weather is too bad and you should avoid going there. Here one single misinformation leads to cancel your plan.

5) Loss of Context: Loss of context generally happens in long-form video which is also known as click bet. But in short-form video this is termed as loss of context, because when you are watching a video the creator starts playing with your mind they creates suspense of something and when the video comes to an end you can't find anything related to that topic and it also miss guides you from the real knowledge.

Till now we have discussed what short-form video content is, why it's so popular, about its merits and demerits. Now it's time to talk about how it is changed entertainment and news consumption.

Here's one thing everyone should know, when these short -form content were introduced their main aim was to entertain its audience in a short time by making changes in consumption habits, storytelling, boosting the engagement, maintaining the authenticity, etc. factors.

1) New way of Storytelling: Short-form video allows creative and innovative ideas for telling something such as from viral challenge to current trending things to product reviews in a very short and concise way making it visually appealing.

Also some content creators post behind the scenes clips of their long form videos because audiences are liking it.

2) Increased engagement: The gradual shift from 10 minute video to just 60 seconds videos gave a rapid boost in engaging audience, also during the advent of short-form content everyone was amazed to see that the same information is available in a 60 seconds video, so no one wanted to watch a 10 minute video. Also some renowned platforms like Mojo, Instagram reels, YouTube shorts acted as a cherry on top of the cake in increasing engagement rates.

3) Versatility in contents: Previously only 3 to 5 long videos were published in 1 month but after short- form video came in the market, with that versatility in contents also came, covering different topics and making 10+ videos in 1 month.

However there are negative impacts also like:

1) Echo Chamber: Short form platforms are creating an echo chamber, which leads to limited exposure into diverse worlds, which potentially contribute to spreading misinformation.

2) High Expectations: Audience, especially younger generation, prefer short and engaging content, however news organisations have taken a step ahead in adapting to this short form video content. Also in this digital age this shift reflects broader aspects towards immediate and concise

information, but with increase in demand there are higher chances of spreading fake and unrealistic information in the market.

3) Traditional journalism has also faced problems after short contents gained viewer's eye. The democratism news dissemination, which allows independent creators and smaller news channels to compete with big organizations. But this battle sometimes leads to over-simplification of complex issues that may spread misinformation. Though many news channels have managed to adapt short form video content, they need to keep some things while publishing short content like maintaining accuracy and context of information and also being accurate with data.

Having discussed thoroughly on each topic, let us not forget that short-form video content is the upcoming future of this fast-paced environment where every second is treated like a diamond.

Lego Robots

The Physics Behind Creative Engineering

Ankur Bhattacharjee, TechSphere Insights,
April 2025, Volume 1, Issue 4, pp. 44–49.

Lego robots change how people engage with science technology engineering and math learning. Physical interactions teach users engineering principles in an entertaining manner. Interacting with technical Lego robots both students and hobbyists gain a physical understanding of physics. When users learn how Lego robots work, it inspires designers to make better automated designs and helps them think creatively. Static Lego robots explain how automated structures can be built through the distribution and balance of their forces.

The Role of Physics in Lego Robots

Physics helps developers make and work better with Lego robots. All aspects of a Lego robot's functionality work thanks to physical rules like mechanical functioning plus force application and material reaction.

Mechanics and Motion

In physics we study physical systems through the descriptions of their movement and force interactions. To make Lego robotics move and stay stable players need to know how mechanics works.

Newton's Laws of Motion

The Lego robots work on the three laws of motion given by Newton:

First Law (Inertia): A Lego robot holds its position or moves forward until someone or something affects its path. The robot keeps moving ahead last time the motor power stops.

Second Law (F = ma): Motor energy regulates a Lego robot's velocity while the reverse direction follows as weight rises.

Third Law (Action-Reaction): When you push against any surface you push back equally from that surface. While you are pushing its wheels backward into the ground the robot is pushing back equally to the forward push from the surface.

Types of Motion

Linear Motion: Robots move along a fixed direction whether they advance or retreat.

Rotational Motion: An object spins around its center line as a wheel turn.

Oscillatory Motion: Periodic motion appears when robotic arms swing back and forth.

Forces and Torque

The robot's movements depend directly on the forces acting on plastic robots. Our mechanical system lets us develop robots that push and lift while remaining steady.

Type of forces in Lego Robotics

Frictional Force: The robot detects the resistance as it moves across a surface.

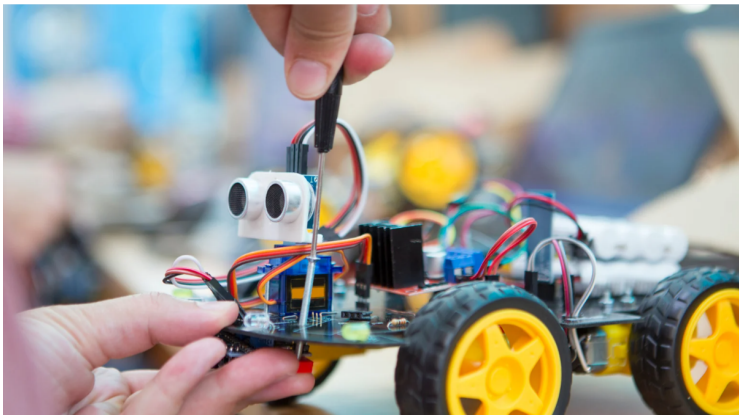
Gravitational Force: According to the Earth's gravitational pull the machine experiences an opposition force towards the ground.

Normal Force: When surfaces resist gravity they want to lift up.

Torque and Gears

The word torque is a term to represent the rotational push you apply to turn an object at speed. In robotics when using Lego gears, torque in conjunction with speed must be applied as follows in order to obtain the final result. When

running slowly on gears torque value increases yet lifting power increases while fast gears produce less torque yet push the robot fast.



Energy Transfer and Power Sources

For a Lego to function well, it needs power. Knowing how energy flows helps in optimizing the use of the battery and maximizing motor efficiency. All conventional Lego robots work by converting electric battery power to moving mechanical systems through electric motors. Our system needs to handle small power losses and supply optimal energy levels to motors. The machine requires energy to do its assigned tasks. The potential energy is maintained in the robot through compressed parts and raised components; whereas, the kinetic energy of the robot has power due to movement and accomplishment of tasks.

Structural Integrity and Material Property

Knowing design basics along with material behavior makes the robots safer throughout their active lifetime. Due to the center of gravity, the robot stays stable when you place it lower to the ground because falling becomes less likely at that height. The weight load positioning helps each wheel to correctly balance the robot body. This design uses solid Lego pieces at essential load points to make the system last longer. The robotic links systems can freely move to absorb shock.

Sensors and Feedback Mechanism

Robots work by using sensors to understand their environment alongside performance measurement. Modern Lego Mindstorms kits include sensors that let robots track what happens around them.

Ultrasonic Sensors: When sensors release sound waves, they measure how far away objects stand.

Gyroscopic Sensors: The gear shows how fast the robot rotates and which way it points.

Touch Sensors: Your robots will detect when you are pressing on them with integrated touch detection.

Light Sensors: The system measures the light levels in the area surrounding the device.

The Closed-Loop Control System is a feedback system that allows the robots to monitor what is occurring during the live work session in order to change their actions.

Applications of Physics in Lego Robotics

As Lego Robots apply physical principles to solve actual problems, it serves well for learning and addressing complex issues, making them valuable tools for both education and practical problem solving.

Education and Learning

Students learn physics and engineering science better by working on real-life experiments with Lego robots as they develop their problem-solving skills. It improves their problem-solving skills through work on Lego robots as they encounter and solve design and programming problems. Students are enabled to develop novel solutions as they use robots in solving real earth and space science challenges and environmental protection work through annual theme rotations from the company. Research indicates that these educational robotic systems will rise 16 percent annually through 2026 with the technology

integration of Lego robotics. Currently, more than one thousand schools worldwide use these Lego Education tools to teach students basic programming and problem-solving using these robots. The COVID-19 pandemic's impact on digital education created more need for Lego robotics kits to teach students these subjects online as well as from their classrooms.

Prototyping and Innovation

Building functional robot prototypes from mechanical systems using Legos to cut development cost and test expenses. Testing robotic theories with Lego robots at the workplace to enhance the work while proving concept value before making bigger real products.

Competitive Robotics

Students participating in FIRST Lego League robotics competitions have to face strong engineering challenges by building their projects. Students who understand the basics of physics learn how to handle obstacles and control moving objects. The global FIRST Lego League program attracted more members with increasing interest thereby allowing 400,000 students from 110 countries to take part annually.

Sales and Revenue

Lego Group recorded 17% revenue growth last year and education products were the growth drivers. Through e-commerce Amazon and Lego witnessed the impact of pandemic increased sales by 25% in kits robotics sales have surged by this level. The educational robotic market is expected to reach $3.1 billion by 2028, which is valued at approximately $1.3 billion in 2022. Lego robotics systems dominated the North America and Europe market. Their schools succeeded due to local authorities who supported their science and technology curriculum. Even the Asia Pacific regions are catching up. India and China are using robot-based programs in education to route money into enhancing their national systems of education.

The basic physics that the students learn lets them observe how the principles of a robot function well in real robotics technology using Lego robots. The basic physics knowledge in mechanics and motions allows the robot builders to create better performing robots than the professional robots. The systems that students develop who study basic physics with Lego robotics allow modern engineers to design better robots and provoke deep exploration by future engineers.

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