

DIGITALIZATION: EMPOWERMENT OR ENSLAVEMENT

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Abstract : Traditionally, human beings have preserved and transmitted memories through storytelling, traditions, photographs, written records and historical documents, passing knowledge and experiences from one generation to another. Traditional education also relied on teacher centered instruction, face to face interaction, memorization, reading, writing, discipline and independent thinking. However, the rapid development of digital technology, along with the integration of smartphones, computers, the internet, artificial intelligence (AI), and the digitalization of education, has transformed not only the teaching–learning process but also our lifestyles and ways of living. Digital platforms allow students to learn at their own pace, anytime and anywhere. Furthermore, these technological advancements have significantly changed the ways in which information and memories are created, stored, accessed, and transmitted. Today, machines, digital devices and artificial intelligence can store enormous amounts of information, reducing the dependence of individuals on their own memory. This research examines the changing relationship between human memory and machine memory in digital age. It explores the question: **if machines can store and retrieve so much information, what happens to human memory and cognitive abilities?** While digital technologies reduce the burden of memorizing information, and facilitate immediate access to information but they also raise questions about their impact on human concentration, critical thinking, logical reasoning, and intellectual independence. It also focuses on education, where digitalization has transformed traditional teaching methods and changed the role of the teacher from a primary source of knowledge to a facilitator of digitally mediated learning. The study seeks to examine whether the externalisation of memory to machines enhances human cognitive capabilities by freeing the mind for high-level thinking, or whether excessive dependence on technology gradually weakens the human capacity to remember, analyse, and reason independently, the research therefore explores the complex relationship between traditional memory, machine memory, and the future of human cognition.

Keywords:- Digitalisation, Human Memory, Machine Memory, Artificial Intelligence, Cognitive Abilities

I. INTRODUCTION

Human beings have always tried to preserve what they know. Long before computers, smartphones and the Internet became part of everyday life, people found different ways of keeping knowledge alive. Stories were told from one generation to another. Traditions were repeated during festivals and family gatherings. Songs, poems and oral histories helped communities remember their past. In many cultures, older members of the community played an important role in preserving knowledge and passing it on to younger generations.

With the development of writing, people found another way to preserve information. Knowledge no longer had to depend completely on someone's memory. Books, letters, photographs, newspapers and historical documents became records that could be kept for future generations. Libraries and archives gradually became important spaces for preserving collective knowledge.

Education was also closely connected with memory. Traditionally, students were expected to listen to teachers, read books, learn information and remember what they had studied. Memorisation was an important part of education, although learning was never only about memorising facts. Students also had to understand concepts and use their knowledge.

The arrival of computers gradually changed this relationship between people and information. Computers made it possible to store large amounts of information electronically. The Internet took this development even further by allowing people to access information from almost anywhere.

Today, a smartphone can contain photographs, telephone numbers, documents, notes, calendars, maps and educational materials. A person does not have to remember everything because much of this information can be stored externally and retrieved whenever it is needed.

This is an important change in human behaviour. We have always used external tools to help us remember. People have written things down in notebooks, kept diaries and used calendars for centuries. Digital technology has simply made these external memory systems much larger, faster and more accessible.

The idea of using external resources to support human thinking is often discussed through the concept of **cognitive offloading**. In simple terms, cognitive offloading means using something outside the mind to reduce the mental effort required to complete a task. A person writing down an appointment instead of trying to remember it is a simple example.

Digital devices have made cognitive offloading part of everyday life. We use our phones to remember appointments, navigation applications to remember routes and search engines to retrieve information.

Research by Sparrow, Liu and Wegner (2011) is particularly relevant to this discussion. Their study found that people who expected information to remain available online were more likely to remember where to find the information rather than the information itself.

This finding raises an interesting possibility. Perhaps digital technology is not simply making us remember less. Perhaps it is changing **what we choose to remember**.

A student may not remember a particular fact because the student knows that it can be found online. A person may not memorise a telephone number because it is already saved in the phone. A traveller may not remember a route because a navigation application can provide directions.

There is nothing necessarily wrong with this. In fact, it can be useful. Human beings have limited time and attention, and external tools can reduce unnecessary mental effort. The problem begins when convenience becomes complete dependence.

The development of artificial intelligence makes the question even more interesting. Earlier digital technologies mainly helped people **find** information. AI systems can now also summarise, explain, translate and generate information. A student can ask an AI system to explain a difficult concept or provide examples of a grammar rule. A teacher can use AI to prepare activities or organise ideas.

This creates a new relationship between human memory and machine memory. Machines are no longer simply storing information for us. They are increasingly helping us process and organise it.

Education is therefore one of the most important areas in which these changes need to be examined. If students can obtain an answer within seconds, what happens to the process of trying to find the answer themselves? If AI can write a paragraph, what happens to the student's opportunity to develop writing skills? If every fact can be searched immediately, what knowledge should students still learn and remember?

These questions do not mean that technology should be removed from education. Digital tools have opened many valuable possibilities. Students can access online libraries, educational videos, digital dictionaries, language-learning applications and international learning resources. Technology can also help students who may not have easy access to traditional educational materials.

The real question is therefore more complicated than asking whether technology is good or bad.

The central question of this paper is:

If machines can store and retrieve enormous amounts of information, what happens to human memory and cognitive abilities?

The paper explores this question by looking at the movement from human memory to machine memory, the effect of digitalization on cognition, the growing role of artificial intelligence and the changing nature of education.

2. Review of Literature

2.1 Human Memory and Learning

Memory plays an important role in learning. When people learn something new, they connect it with information and experiences that they already have. Without some form of memory, learning would be difficult because every experience would feel completely new.

Traditional education therefore gave considerable importance to remembering information. Students memorised vocabulary, dates, formulas, definitions and concepts. Although education has gradually moved towards more activity-based and learner-centred approaches, memory remains an important part of learning.

Human memory is also closely connected with culture. A community's history can survive through stories, traditions, songs and shared experiences. In this sense, memory is not only an individual process. It can also be collective.

The development of written records changed the situation. Books allowed information to remain available even after the person who originally knew it was no longer alive. In this way, books became a form of external memory.

2.2 Digitalization and Human Memory

Digital technology has expanded the idea of external memory.

A smartphone can store thousands of photographs, contacts and documents. Cloud services can store files that can be accessed from different devices. Search engines allow people to find information without having to remember exactly where it is stored.

This has changed everyday memory practices.

Sparrow, Liu and Wegner's research suggested that people may remember the location of information rather than the information itself when they believe that the information will remain available.

For example, instead of remembering a detailed fact, a person may remember that the fact was found on a particular website. Instead of remembering a person's phone number, the person remembers the person's name and trusts the phone to provide the number.

This does not automatically mean that digital technology weakens memory. It may simply mean that people use their memory differently.

Recent work on cognitive offloading also suggests that external tools can help people perform tasks while changing the way cognitive effort is distributed.

2.3 Technology and Cognitive Abilities

Cognitive abilities include memory, attention, reasoning, problem-solving and decision-making.

Digital technology can support these abilities in many ways. A calculator can help with difficult calculations. A dictionary can help with vocabulary. A digital map can help with navigation. Educational applications can provide practice and feedback.

At the same time, digital environments can create distractions. A smartphone may provide educational information, but it can also provide messages, social media, videos and notifications.

The issue is therefore not simply whether technology affects concentration. The way technology is used matters.

Information overload is another concern. Students today may have access to thousands of sources for a single topic. The challenge is no longer simply finding information. It is deciding which information deserves attention.

This makes critical thinking particularly important.

A student needs to ask whether a source is reliable, whether the information is supported by evidence and whether different sources present the same issue differently.

2.4 Machine Memory and Artificial Intelligence

The term **machine memory** can be used to describe the ability of computers and digital systems to store and retrieve information.

Unlike human memory, machine storage does not depend on personal experience or emotion. It is designed to preserve data so that it can be accessed when needed.

Artificial intelligence adds a new dimension to this relationship. AI systems can process information and generate responses. They can summarise information, translate text and provide explanations.

This makes AI different from a simple storage system. A digital archive stores information, while an AI system can interact with information and produce a response.

As a result, the relationship between human and machine memory is becoming more complex.

2.5 Digitalization of Education

Education has changed considerably with the growth of digital technology.

The traditional classroom depended mainly on the teacher, textbook, notebook and blackboard. Today, teachers and students can use smartboards, online resources, digital libraries, learning platforms and artificial intelligence.

These technologies can make learning more flexible. Students can access materials outside the classroom and can revisit lessons when necessary.

The teacher's role is also changing. Teachers are no longer the only source of information. Students can find information independently.

However, this does not make teachers unnecessary. A student may find hundreds of answers online but still need a teacher to understand which answer is reliable and how different ideas are connected.

UNESCO's guidance on generative AI in education and research stresses the importance of a human-centred approach to the use of AI in education.

2.6 Research Gap

Existing research has examined different aspects of technology, memory, cognition and education. Studies on cognitive offloading have explored how people use external tools to reduce mental effort. Research on Internet use has examined the relationship between online information and memory. Recent educational discussions have also focused on artificial intelligence.

However, these issues are often discussed separately.

There is a need to look at them together and ask how **human memory, machine memory, cognition and education are connected**.

This paper attempts to bring these areas together. It does not claim that digital technology simply weakens human memory. Instead, it looks at how digitalization is changing the relationship between remembering, accessing information and understanding knowledge.

3. Research Problem

Digital technology has made information easier to store and access than ever before. A smartphone or computer can provide information within seconds. Artificial intelligence has made this process even more interactive.

This convenience has changed the way people approach information.

In the past, a student might have had to search through several books to find an answer. Today, the same student can type a question into a search engine and receive thousands of results almost immediately.

This raises an important educational question: **when information becomes extremely easy to access, does the process of remembering and understanding change?**

The problem becomes more complicated with AI. A student can now ask an AI system to explain a concept, summarise a chapter or even help write an assignment.

These tools can be useful, but they can also reduce the amount of effort a student puts into a task if they are used without reflection.

The research problem of this paper is therefore the changing relationship between **human memory and machine memory**, especially within education.

Main Research Question

"If machines can store and retrieve so much information, what happens to human memory and cognitive abilities?"

4. Objectives of the Study

The main objective of this paper is to understand how digitalization is changing the relationship between **human memory and machine memory**.

The study specifically aims:

1. To examine how digitalization has changed traditional ways of remembering and storing information.
2. To understand the concept of machine memory and external memory.
3. To explore the relationship between digital technology and human cognitive abilities.
4. To examine the impact of digitalization on teaching and learning.
5. To understand how the role of the teacher is changing in a digital classroom.
6. To examine the growing role of artificial intelligence in education.
7. To explore how technological assistance can be balanced with human cognitive independence.

5. Methodology

5.1 Research Approach

The paper follows a **qualitative and exploratory approach**. It is based on the study and interpretation of existing literature rather than on an experiment involving students.

The purpose is to understand ideas and patterns related to digitalization, memory, cognition, AI and education.

5.2 Nature of the Study

The research is **descriptive and analytical**.

It describes how technology has changed the ways in which people store and access information and then examines what these changes may mean for memory and education.

5.3 Sources of Data

The paper uses secondary sources, including:

- Books
- Research papers
- Academic journals
- Educational studies
- Research reports
- UNESCO publications
- Reliable online academic sources

The study particularly draws on literature related to memory, cognitive offloading, digital technology, artificial intelligence and education.

5.4 Scope of the Study

The study focuses on digitalization and its relationship with human memory and cognitive abilities.

Particular attention is given to education because students and teachers are among the major users of digital technologies and AI.

6. CHAPTERS

Chapter 1: From Human Memory to Machine Memory

Human beings have always found ways to preserve knowledge and memories. Before digital technology, memory was largely carried through people, stories, books, photographs and physical documents. With the development of computers and the Internet, information gradually moved from human minds and physical records into digital spaces. This chapter traces that transition and examines how machines have become external memory systems in everyday life. It also considers how the relationship between human and machine memory is changing as technology moves beyond simple storage and begins to assist with the creation and interpretation of information.

1.1 Traditional Ways of Preserving Memory

Before the arrival of digital technology, people depended greatly on their own memory and on physical ways of recording information. Stories, songs, traditions, personal experiences and written documents helped knowledge move from one generation to another. Older members of communities often became important sources of knowledge because they carried memories of events, customs and experiences. Remembering was therefore not only an individual activity but also a social and cultural responsibility. These traditional practices remind us that human beings have always searched for ways to preserve what they consider valuable and meaningful.

1.2 Stories, Traditions and Cultural Memory

Stories preserve much more than simple facts. They carry emotions, values, beliefs and experiences that help communities understand their past. A story about an important event can tell younger generations not only what happened but also how earlier generations understood and responded to it. Traditions work in a similar way by connecting people with their cultural roots. Even in a highly digital world, such forms of memory remain meaningful because they provide a sense of identity and continuity. Digital technology can record these memories, but the human meaning attached to them remains important.

1.3 Books, Photographs and Written Records

Books, photographs and written records provided people with ways to preserve memories beyond the limits of the human mind. A photograph can capture a particular moment, while a book can preserve ideas, experiences and knowledge through language. Historical documents can also provide evidence that allows later generations to understand the past. Digital technology has made preservation faster and easier, but it has not made these older forms irrelevant. In fact, many books, photographs and documents are now being digitised so that they can be stored, shared and accessed more widely.

1.4 Memory and Traditional Education

Traditional education placed considerable importance on remembering information. Students were expected to learn from textbooks, classroom explanations and notes and later reproduce this knowledge in examinations. Memorisation was therefore an important part of the learning process. Modern education increasingly focuses on understanding, application, creativity and critical thinking, but memory has not lost its importance. Previous knowledge provides a foundation for learning something new. Without some basic knowledge stored in the mind, it becomes difficult to understand, connect or critically examine new information. Memory therefore remains an essential part of meaningful learning.

1.5 The Beginning of Digital Memory

The development of computers changed the way information could be stored. Documents no longer had to exist only in physical form; they could also be converted into digital files. These files could be copied, transferred, edited and accessed more easily than many traditional records. The development of the Internet expanded this process further by connecting people and information across geographical boundaries. What once required physical space could increasingly be stored electronically. This marked an important shift from memory that was mainly human or physical towards a system in which machines could store enormous amounts of information.

1.6 Machines as External Memory

Today, digital devices function as external memory systems in everyday life. A smartphone stores contacts and photographs, a calendar remembers appointments, navigation applications remember routes and cloud platforms store documents. People increasingly rely on these tools for information that they might previously have remembered themselves. However, this does not

mean that human memory has disappeared. Instead, remembering has become partly distributed between people and the technologies they use. Machines can store and retrieve information quickly, while humans continue to decide what information matters and how it should be understood.

1.7 Changing Relationship Between Human and Machine Memory

The relationship between humans and machines is becoming increasingly interconnected. Machines are highly effective at storing, organising and retrieving information, while humans provide purpose, meaning and context. The situation becomes more complex when machines move beyond storing information and begin to generate, explain and interpret it. Artificial intelligence is an important example of this change. It raises a new question: if machines can increasingly assist us not only in remembering but also in processing knowledge, what abilities should humans continue to develop themselves?

Chapter 2: Digitalization and Human Cognition

Digitalization has changed not only how information is stored but also how people think, remember and pay attention. Digital tools have become part of ordinary activities such as communication, education, banking, travel and entertainment. This chapter examines how constant access to information influences memory and concentration. It also considers information overload, critical thinking and dependence on technology. The main concern is not that technology is automatically harmful, but that excessive dependence may change the way people use their own cognitive abilities. The chapter therefore explores the need for a balanced relationship between human cognition and digital tools.

2.1 Digitalization in Everyday Life

Digitalization has moved far beyond the computer screen and become part of ordinary life. People use digital systems to communicate, shop, manage money, travel, study and entertain themselves. Many everyday decisions now involve some form of digital technology. Checking a map, searching for information or making an online payment can happen within seconds. This convenience has changed people's expectations about speed and accessibility. Technology is no longer something separate from everyday life; it has become part of the environment in which people work, learn, communicate and make decisions.

2.2 Remembering in the Digital Age

People today do not necessarily remember information in the same way as previous generations. For example, a person may remember someone's name but not their telephone number because the number is already stored in a smartphone. Similarly, a student may understand the general topic of an article but search online whenever exact details are needed. Digital tools therefore change what people choose to remember internally. This can be useful because it reduces the pressure to memorise every small detail. At the same time, it raises questions about whether constant external support may gradually weaken the habit of remembering.

2.3 Smartphones and Instant Information

The smartphone is perhaps the clearest example of an external memory system. It stores contacts, photographs, reminders, documents, messages and countless pieces of information. It can also provide directions and answers almost immediately. Such convenience can make everyday life easier and more organised. However, instant access may also reduce the motivation to remember information independently. Instead of trying to recall something, people may immediately reach for their phones. The issue is therefore not the existence of smartphones but the extent to which people allow these devices to replace rather than support their own memory.

2.4 Digital Technology and Concentration

Digital technology can support learning, but it can also make concentration difficult. While reading or studying, a notification, message or social-media update can interrupt attention. Even when people intend to focus, the possibility of receiving new information can become a distraction. This does not mean that digital devices are always harmful to concentration. Their effect depends greatly on how intentionally they are used. A device used for reading a digital book is different from one constantly used for checking notifications. Developing the ability to control digital attention is therefore increasingly important.

2.5 Information Overload and Attention

The digital world offers an enormous amount of information, but more information does not always mean better understanding. A student searching for one topic may encounter thousands of websites, videos, articles and opinions. Deciding which information is useful can become difficult and time-consuming. The challenge has therefore shifted from simply finding information to filtering and evaluating it. Attention has become an important resource in the digital age. Learners need to know not only how to search but also when to stop searching and focus on understanding what they have already found.

2.6 Critical Thinking and Logical Reasoning

When information is easily available, critical thinking becomes even more important. Students cannot simply accept the first answer that appears on a screen. They need to compare information, examine sources and consider whether an explanation is supported by evidence. A confident or well-written answer is not necessarily a correct one. Digital technology therefore creates a need for stronger reasoning skills rather than making reasoning unnecessary. The ability to question information, identify limitations and form independent conclusions remains a distinctly important human skill in an environment where information is available almost instantly.

2.7 Dependence on Digital Technology

Some dependence on technology is a normal part of modern life. People have always used tools to make tasks easier. We use clocks to tell time and calculators for complex calculations, for example. The concern begins when technological support becomes so constant that people feel unable to perform basic tasks without it. If every small question immediately leads to a search, people may practise remembering and reasoning less often. The important distinction is therefore between using technology as a useful tool and becoming so dependent on it that personal abilities are no longer actively exercised.

2.8 Human Cognition in a Digital World

Human cognition will continue to change as technology develops. The goal should not necessarily be to prevent this change, because technology can genuinely extend human abilities. Instead, the challenge is to ensure that digital tools support rather than weaken important cognitive skills. People still need to remember essential knowledge, concentrate, question information and make decisions. Technology can provide assistance, but it cannot remove the need for human judgment. A healthy digital environment

should therefore encourage people to use technology intelligently while continuing to develop the cognitive abilities that make learning and understanding possible.

Chapter 3: Artificial Intelligence and the Changing Nature of Memory

Artificial intelligence has introduced a new stage in the relationship between humans and machines. Earlier digital technologies mainly helped people store and retrieve information, whereas AI can now process information and generate responses. This has important implications for learning and memory. AI can explain difficult concepts, provide examples, support language learning and assist with revision. At the same time, excessive dependence may reduce opportunities for independent thinking, writing and problem-solving. This chapter explores both possibilities and concerns, focusing on the importance of using AI as an assistant while preserving human judgment, creativity and intellectual independence.

3.1 Understanding Artificial Intelligence

Artificial intelligence has become one of the most visible developments in contemporary digital technology. AI systems can process large amounts of information, identify patterns and generate responses to user requests. Generative AI has made these capabilities accessible to ordinary users through conversational tools and other applications. This represents an important change because machines are no longer used only to store information or perform fixed calculations. They can now participate in tasks that appear connected with language, explanation and knowledge production. This development creates new possibilities while also raising questions about the changing role of human thinking.

3.2 AI as a Source of Information

Traditional search engines generally helped users locate information by providing links to different sources. Generative AI can instead produce a direct response in a conversational form. This can make information easier and faster to access. However, the convenience may also mean that users spend less time examining original sources. When an answer is presented clearly and confidently, it can be tempting to accept it without further checking. AI should therefore be treated as a starting point for understanding rather than an unquestionable authority. Users still need to verify information and consider the evidence behind an answer.

3.3 Human Memory and AI-Assisted Learning

AI can become useful in education when it is treated as a learning assistant rather than a replacement for learning. A student struggling with a difficult concept can ask AI for a simpler explanation, additional examples or another way of understanding the topic. This can make learning more flexible and personalised. However, the learner still has an important role. The student must read, think, question and evaluate the response. In this way, AI can support the learning process while human memory and understanding remain at the centre of education.

3.4 Generative AI and Knowledge Access

Generative AI has made access to knowledge more convenient. It can explain concepts, translate text, summarise information, organise ideas and provide examples within a short period of time. These abilities can be particularly helpful for students and teachers who need support with large amounts of material. Yet convenience should not be confused with learning. Receiving a summary is not the same as understanding the original material. Similarly, receiving an explanation does not guarantee that the learner will remember it. AI can reduce the difficulty of accessing knowledge, but meaningful learning still requires human engagement.

3.5 AI and Independent Thinking

Independent thinking requires people to engage with difficult questions rather than simply avoid them. If students use AI only to complete assignments without understanding the material, they may lose valuable opportunities to practise writing, reasoning and problem-solving. However, AI can also be used differently. Students can ask questions, compare explanations, challenge responses and use AI feedback to improve their own work. The difference lies in the purpose of use. AI can either reduce intellectual effort or encourage deeper engagement, depending on whether the learner uses it to replace thinking or to support thinking.

3.6 Benefits of AI

AI can provide several useful forms of educational support. It can offer explanations when a student does not understand a concept and can generate practice questions for revision. In language learning, it can provide vocabulary, examples, translations and opportunities for practice. Teachers can also use AI to prepare activities, examples and learning materials. It may support learners who need information presented in different ways. These possibilities show that AI can expand educational resources and save time. Its value, however, depends on thoughtful use and on maintaining human supervision and judgment.

3.7 Concerns About Excessive Dependence on AI

Along with its benefits, AI creates concerns about excessive dependence. Students may accept incorrect or incomplete information without checking it. They may also rely on AI to produce essays, answers or ideas that they should learn to develop themselves. Over time, this could reduce opportunities to practise important academic skills. These concerns make digital and AI literacy increasingly necessary. Students need to understand both what AI can do and where it can fail. Responsible use requires users to question, verify and edit AI-generated information rather than accepting it automatically.

3.8 Human Intelligence and Machine Intelligence

Human and machine intelligence have different strengths. Machines can process and organise enormous amounts of information quickly, while humans understand information through experience, emotion, values and social relationships. Human beings can also make judgments based on situations that cannot always be reduced to data. This difference suggests that education should not simply prepare students to compete with machines. Instead, it should help them learn how to work with technology while maintaining their own intellectual abilities. The future of education may therefore depend on cooperation between human strengths and machine capabilities.

Chapter 4: Digitalization and Education

Education has experienced significant changes as digital technology has entered the classroom. The traditional blackboard-and-textbook model has gradually been supplemented by smartboards, projectors, online platforms, digital resources and AI-based tools. These developments have changed how teachers teach and how students access knowledge. However, technology alone does not guarantee meaningful learning. The teacher's role remains important in guiding students, encouraging discussion and helping them evaluate information. This chapter examines digital classrooms, blended learning, student autonomy and AI in education while emphasising the continuing importance of human interaction in the learning process.

4.1 From Traditional Classroom to Digital Classroom

The traditional classroom centred mainly on the teacher, blackboard, textbook and face-to-face interaction. Today, many classrooms also use projectors, smartboards, online platforms, digital presentations and multimedia resources. These tools can make lessons more visual and provide access to different forms of learning material. However, the presence of technology does not automatically improve education. A digital classroom can still become teacher-centred if technology is used only to present information. What matters is how the technology is integrated into teaching and whether it encourages students to participate, question and understand.

4.2 The Changing Role of the Teacher

The teacher is no longer the only source from which students can obtain information. With a smartphone or computer, students can access explanations, articles, videos and educational resources independently. This has changed the teacher's role rather than making it unnecessary. Teachers increasingly act as guides who help students understand difficult concepts, evaluate sources and connect different ideas. They also create opportunities for discussion and interaction. In an environment filled with information, the teacher's ability to provide direction and context becomes especially important. Human guidance remains central to meaningful education.

4.3 From Blackboard to Smartboard

The movement from blackboards to smartboards reflects the wider digital transformation of education. Teachers can now combine text with photographs, videos, presentations, diagrams and interactive activities. Such resources can make lessons more engaging and help explain ideas visually. At the same time, technology should not be used simply because it is available. A smartboard does not automatically create better learning than a blackboard. The teacher still needs to decide what method is appropriate for a particular lesson. The value of technology comes from meaningful use, not from the technology itself.

4.4 Online and Blended Learning

Online and blended learning have created greater flexibility in education. Students can attend classes remotely, access recorded lectures, download learning materials and communicate with teachers through digital platforms. This can be particularly useful when physical attendance is difficult or when students need additional time to review lessons. At the same time, online learning requires self-discipline and responsibility. Without regular interaction or motivation, some learners may struggle to remain engaged. Blended learning therefore offers useful possibilities, but its success depends on thoughtful teaching practices and active participation from students.

4.5 Digital Resources and Student Learning

Students today can access an enormous variety of educational resources. Online libraries, videos, articles, language-learning platforms and educational websites can extend learning beyond the classroom. However, the abundance of resources also creates a problem of choice. Students need to learn how to identify reliable and relevant information rather than simply collecting material. Digital literacy is therefore about more than knowing how to use technology. It also involves understanding sources, checking information and using resources responsibly. Access to information becomes meaningful only when students know how to select, understand and evaluate it.

4.6 Technology and Student Autonomy

Digital technology can encourage students to become more independent learners. They can explore subjects beyond the classroom, repeat lessons and find additional explanations whenever necessary. This flexibility can help students learn according to their own pace and interests. However, autonomy also requires responsibility. Students need to recognise when they can find an answer independently and when they should ask a teacher for guidance. They also need to distinguish between reliable and unreliable information. Technology can provide the tools for independent learning, but students must develop the judgment needed to use those tools effectively.

4.7 Artificial Intelligence in Education

Artificial intelligence is gradually becoming part of educational practice. Students can use AI for explanations, examples, language practice and revision, while teachers can use it to support lesson planning and material preparation. At the same time, educational use of AI raises questions about accuracy, privacy, academic integrity and human judgment. Institutions and teachers therefore need to consider not only what AI can provide but also how it should be used responsibly. The aim should be to integrate AI in ways that support learning without reducing the importance of teachers, students and genuine intellectual effort.

4.8 Human Interaction in a Digital Classroom

Education involves more than transferring information from one person to another. Students learn through conversations, questions, group activities, cooperation and relationships with teachers and classmates. These interactions help develop communication, confidence and social understanding. Digital technology can support such interaction through online discussions and collaborative platforms, but it cannot completely replace the human dimension of education. A classroom should therefore not become only a place where students interact with screens. Technology can strengthen educational interaction, but meaningful learning still depends greatly on human communication and participation.

Chapter 5: Digitalization — Empowerment or Enslavement?

Digital technology has created opportunities that were difficult to imagine in earlier generations. Information, education and communication can now cross geographical boundaries almost instantly. At the same time, the same technology can create dependence, distraction and reduced intellectual effort when used without awareness. This chapter examines both sides of digitalization and asks whether technology is helping people become more capable or encouraging them to depend increasingly on machines. Rather than treating technology as entirely positive or negative, the chapter focuses on the need for balance, responsibility and human control over digital tools.

5.1 Technology as a Source of Empowerment

Digital technology has expanded access to information and education on an unprecedented scale. A student can attend an online lecture from another country, while a teacher can access educational resources created by institutions around the world. Language learners can practise using digital applications, videos and online materials without being limited to a physical classroom. These possibilities can make education more accessible and flexible. Technology can therefore empower people by removing certain geographical and practical barriers. Its empowering potential is strongest when people use it to expand their knowledge, skills and opportunities rather than simply to seek quick answers.

5.2 Easy Access to Knowledge

Finding information has become easier than ever. A question that once required searching through books or asking another person can often be answered within seconds. This convenience is valuable, but it also creates a new responsibility. Access to information does not automatically mean access to knowledge. People still need to understand what they find, consider whether it is reliable and connect it with existing knowledge. In the digital age, therefore, the important skill is not simply knowing how to find information. It is knowing how to interpret, evaluate and use that information responsibly.

5.3 Personalized and Flexible Learning

Digital tools allow learners to study in ways that were not always possible in traditional classrooms. Students can pause and repeat lessons, watch explanations again, search for additional examples and learn at a pace that suits them. AI may further support personalised learning by responding to individual questions and providing different explanations. This flexibility can be valuable for learners with different needs and learning styles. However, personalised technology should support genuine learning rather than encourage passive consumption. The learner still needs to engage actively with the material and develop an understanding that goes beyond receiving ready-made answers.

5.4 The Growing Dependence on Machines

The increasing use of digital devices can also create a strong dependence on machines. People may feel uncomfortable when they do not have access to their smartphones or may immediately search for information instead of trying to remember it themselves. Such behaviour is understandable because digital tools are designed to provide quick assistance. However, it raises an important question about how much responsibility should be transferred from people to machines. The issue is not whether people should use technology, but whether they should remain capable of functioning, remembering and thinking when technological assistance is not immediately available.

5.5 What Happens When We Stop Remembering?

One of the central questions of this research is what happens when people increasingly allow machines to remember information for them. It may not be necessary to memorise every fact in a world where information is easily accessible. Yet some knowledge needs to remain within the mind because it provides the foundation for understanding new information. A student cannot critically analyse a complex idea without some background knowledge. Memory therefore remains important even when machines can store enormous amounts of information. The challenge is to decide what should be remembered internally and what can reasonably be stored externally.

5.6 Technology and Intellectual Independence

Technology can either support intellectual independence or reduce it, depending on how it is used. Searching for a fact, checking a calculation or using a digital resource does not automatically make a person less independent. The concern is greater when technology is used to avoid learning skills that require personal effort. For example, using AI to understand how to improve writing is different from asking it to write everything without engagement. The key distinction is whether technology supports the thinking process or replaces it. Intellectual independence requires people to remain actively involved in their own learning.

5.7 Finding a Balance Between Humans and Machines

A balanced approach does not require rejecting technology. Digital tools have become valuable parts of education, work and everyday life, and their benefits should not be ignored. At the same time, people need to recognise the limits of technological assistance. Machines can store, calculate, organise and process information rapidly. Humans need to interpret that information, question it and make decisions about how it should be used. The aim should therefore be cooperation rather than replacement. Technology should extend human abilities while people continue to exercise memory, judgment, creativity and responsibility.

5.8 The Future of Human Memory and Cognition

The future may involve an even closer relationship between humans and machines. People may remember fewer details internally while becoming increasingly skilled at finding, organising and evaluating information externally. This does not necessarily mean that human memory will disappear. Instead, the way people use memory may continue to change. What remains important is maintaining the ability to understand, question and make informed decisions. Technological convenience should not remove the need for human knowledge and judgment. The future of memory may therefore depend on learning how to live with machines without allowing machines to replace the human capacity to think.

6. Conclusion

Digitalization has changed the way human beings live, communicate, learn and remember. We have moved from a world where knowledge was preserved mainly through human memory, stories, books and physical records to one in which enormous amounts of information can be stored digitally and accessed almost immediately.

This change has many positive sides. Digital technology can save time, make information more accessible and provide new opportunities for education. Students can access resources that were once difficult to obtain, while teachers can use digital tools to make lessons more varied and interactive.

At the same time, the growing dependence on technology raises genuine questions. When information is always available, people may not feel the same need to remember it. When smartphones can remember our appointments, contacts and routes, we naturally depend on them. When search engines can answer questions within seconds, we may spend less time trying to recall information ourselves.

Artificial intelligence has taken this relationship even further. AI can now provide explanations, summaries and suggestions rather than simply storing information. This can be extremely useful in education, but it also creates a responsibility for learners to remain actively involved in the learning process.

The answer to the question “**Digitalization: empowerment or enslavement?**” is therefore not straightforward. Digital technology can empower people when it gives them greater access to knowledge and helps them learn more effectively. At the same time, excessive dependence can create problems when people stop questioning information or rely on machines for tasks that they should still be able to perform independently.

The purpose of education should not be to make students remember every piece of information. That would be unrealistic in a world where information is constantly growing. Instead, education should help students develop a strong foundation of knowledge and the ability to think critically about the information they encounter.

Perhaps the future is not about choosing between human memory and machine memory. It is about learning how the two can work together.

Machines can remember large amounts of information. They can search quickly, process data and provide assistance. Human beings, however, give information meaning. They ask questions, make connections, understand experiences and decide what information matters.

For this reason, technology should remain a **tool for human intelligence rather than a replacement for it**.

The real challenge of the digital future is not to prevent machines from becoming more capable. It is to ensure that human beings continue to develop the ability to think, question, understand and make independent judgments while using those machines.

7. References

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