Artificial Intelligence and the Future of Learning and Instruction

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What I Do

Mechanism + Electronics =
Mechatronics

Academics + Entreprenuership =
Acadopreneurship

Artificial + Intelligence =
Artificial Intelligence

Spiritual + Intelligence =
Spiritual Intelligence

Distance + Virtual + Online + Learning =
Borderless Learning

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My Vision

"At Summit University, Offa, we shall be developing innovations and inventions that will be changing the way we live in our communities, we defend our nations and work in Africa"

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Overview

- Artificial Intelligence (AI) is transforming learning and instruction by personalizing education, automating administrative tasks, and enhancing engagement through interactive tools.
- Despite its advantages, AI in education presents challenges such as ethical concerns, data privacy, and the need for educators to adapt to new technologies.
- This presentation includes case studies showcasing successful AI applications in learning environments, offering insights into the potential for AI to create more inclusive and efficient educational experiences.
- The talk concludes by discussing strategies to address these challenges responsibly, ensuring AI's role in education is both beneficial and sustainable for future generations.

Outline

- The Emerging Technology
- Artificial Intelligence (AI)
- The Current State of Learning and Instruction
- Role of Artificial Intelligence in Education
- Enhancing Instruction with Artificial Intelligence
- Benefits of Artificial Intelligence in Learning
- Challenges and Considerations
- The Future of Learning and Instruction
- Case Studies
- Conclusion

The Current State of Learning and Instruction

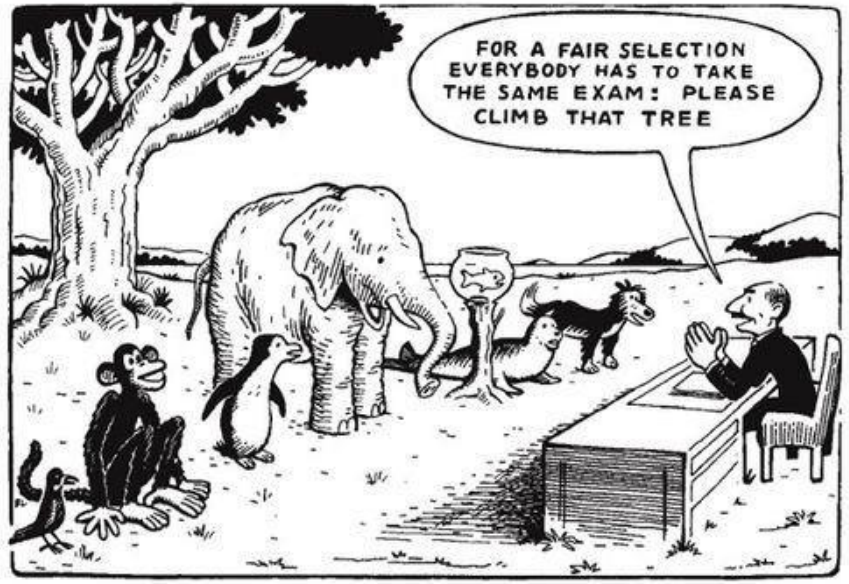
Traditional Learning Methods

❑Lecture-Based Instruction:

- Teachers deliver content through lectures, with limited interaction.

❑One-Size-Fits-All Approach:

- Curriculum designed for a general audience, not tailored to individual needs.



Limitations of Conventional Learning Approaches

❑**Lack of Personalization:**

- Students may struggle to grasp concepts if they do not align with their learning preferences.

❑**Limited Accessibility:**

- Barriers to access for students with disabilities or those in remote areas.

The Current State of Instruction and Instruction Delivery

Infrastructure and Resource Limitations

❑Inadequate Facilities:

- Many schools, particularly in rural areas, lack essential infrastructure such as proper classrooms, electricity, and access to modern teaching tools.

❑Resource Constraints:

- Limited funding often results in outdated textbooks and limited access to instructional materials.

Traditional Teaching Methods

❑Teacher-Centered Approach:

- Instruction is largely teacher-centered, focusing on lecture-based delivery with limited interaction or student engagement.

❑Rote Learning:

- Emphasis on rote memorization over critical thinking and problem-solving skills has led to lower retention and application of knowledge, which affects students' overall preparedness for the modern workforce.

Teacher Training and Development

❑Underqualified Instructors:

- A significant percentage of teachers lack advanced qualifications and training in modern instructional strategies.

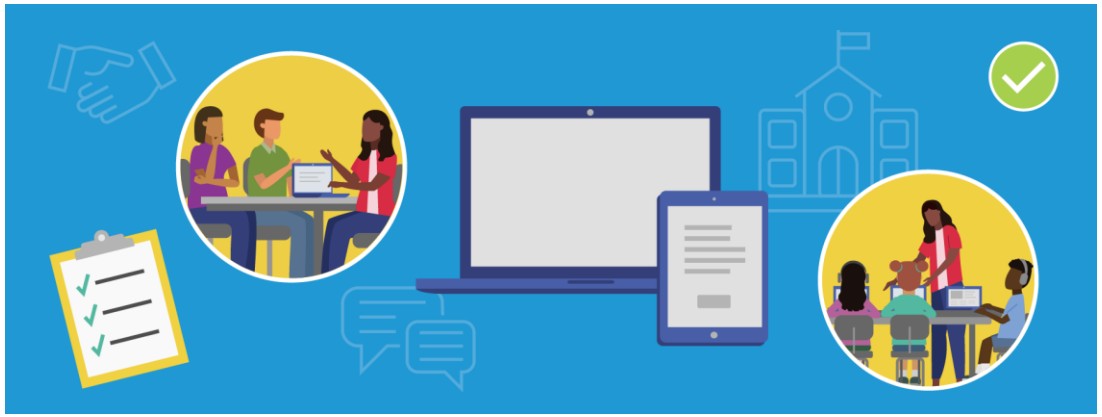
❑Professional Development Gaps:

- There are limited opportunities for teachers to pursue continuous professional development.

Integration of Technology

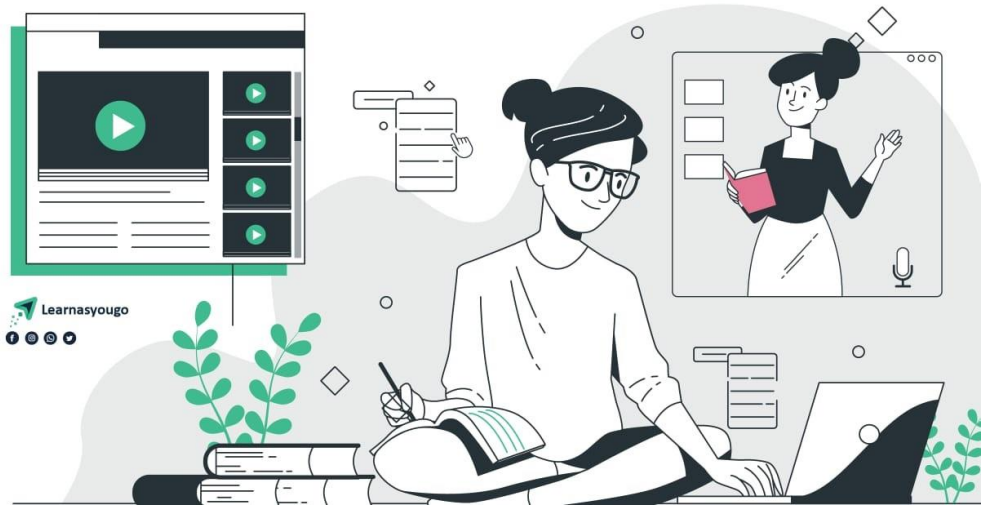
❑**Slow Adoption of Educational Technology:**

- While there has been some growth in EdTech adoption, it remains limited to a few urban and private institutions.



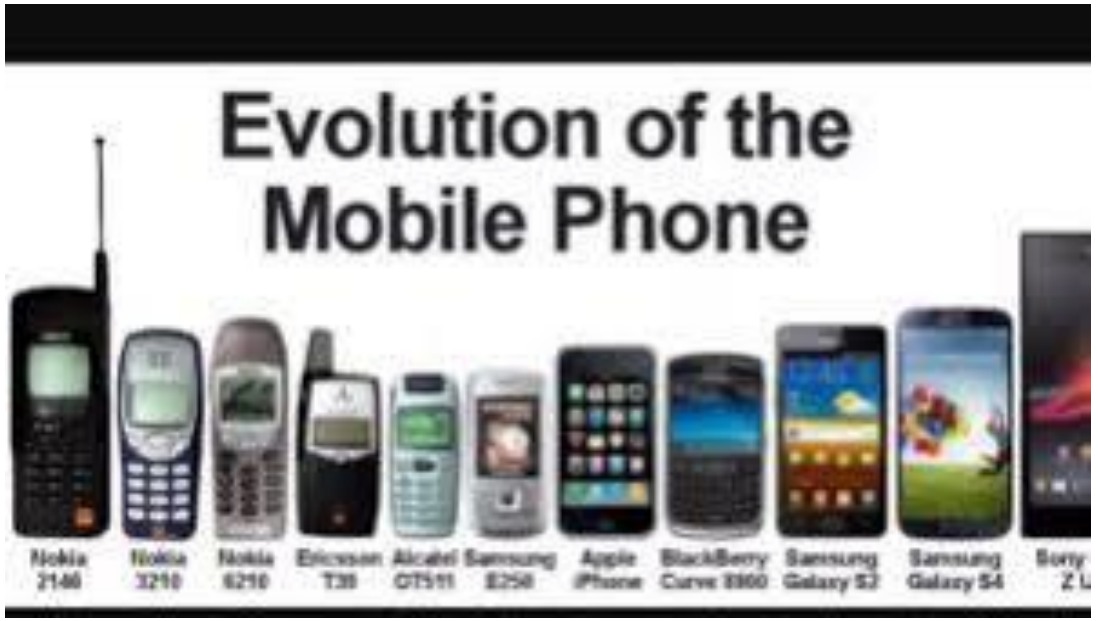
❑**Emerging E-Learning Platforms:**

- Platforms such as uLesson and Edustore have emerged, providing students with supplementary learning resources, especially in urban areas.



Evolution

In just 10 years camera man & pilot both lost their jobs. UPGRADE YOURSELF



And this?

1984 **2023**

Where are the Big Boys ?

At a time in Nigeria, this was a vehicle owned by a Nigerian big man

What is the big question?

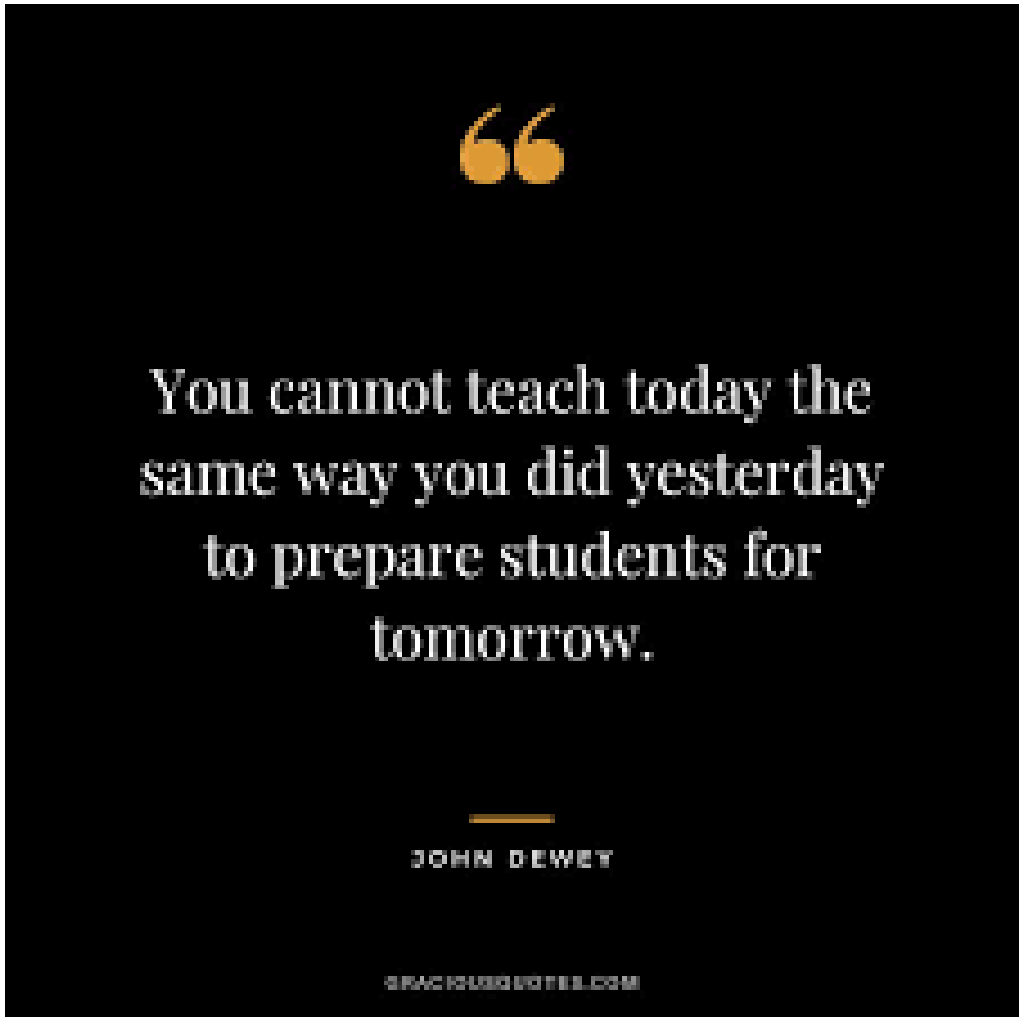
Digital Transformation. How prepared are we for 2030?

What is the big question?

VS

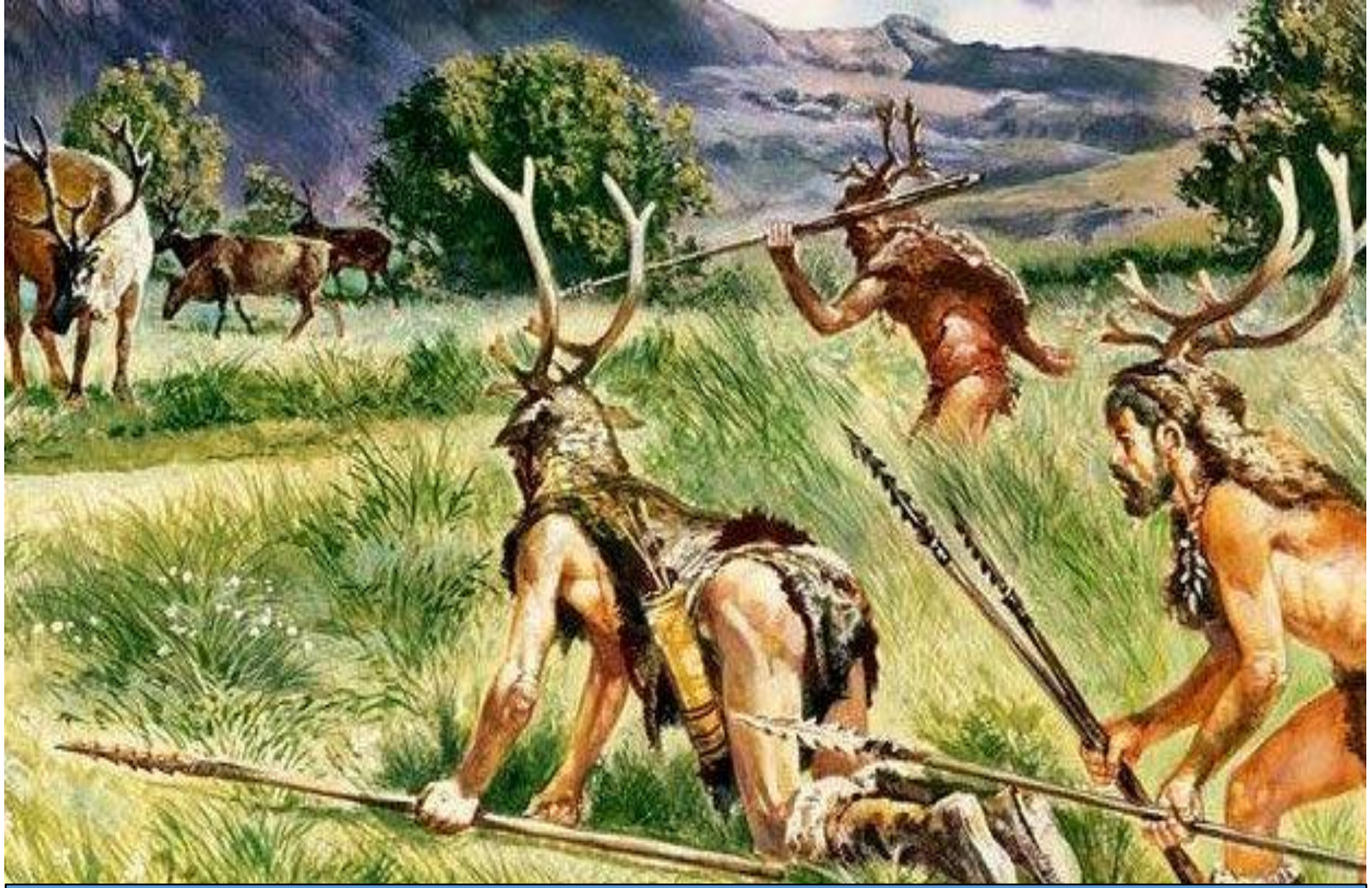
How prepared are we for 2030?


TECHNOLOGY WON'T REPLACE TEACHERS
BUT TEACHERS WHO USE TECHNOLOGY WILL PROBABLY REPLACE TEACHERS WHO DO NOT.
UNIQUE TEACHING RESOURCES

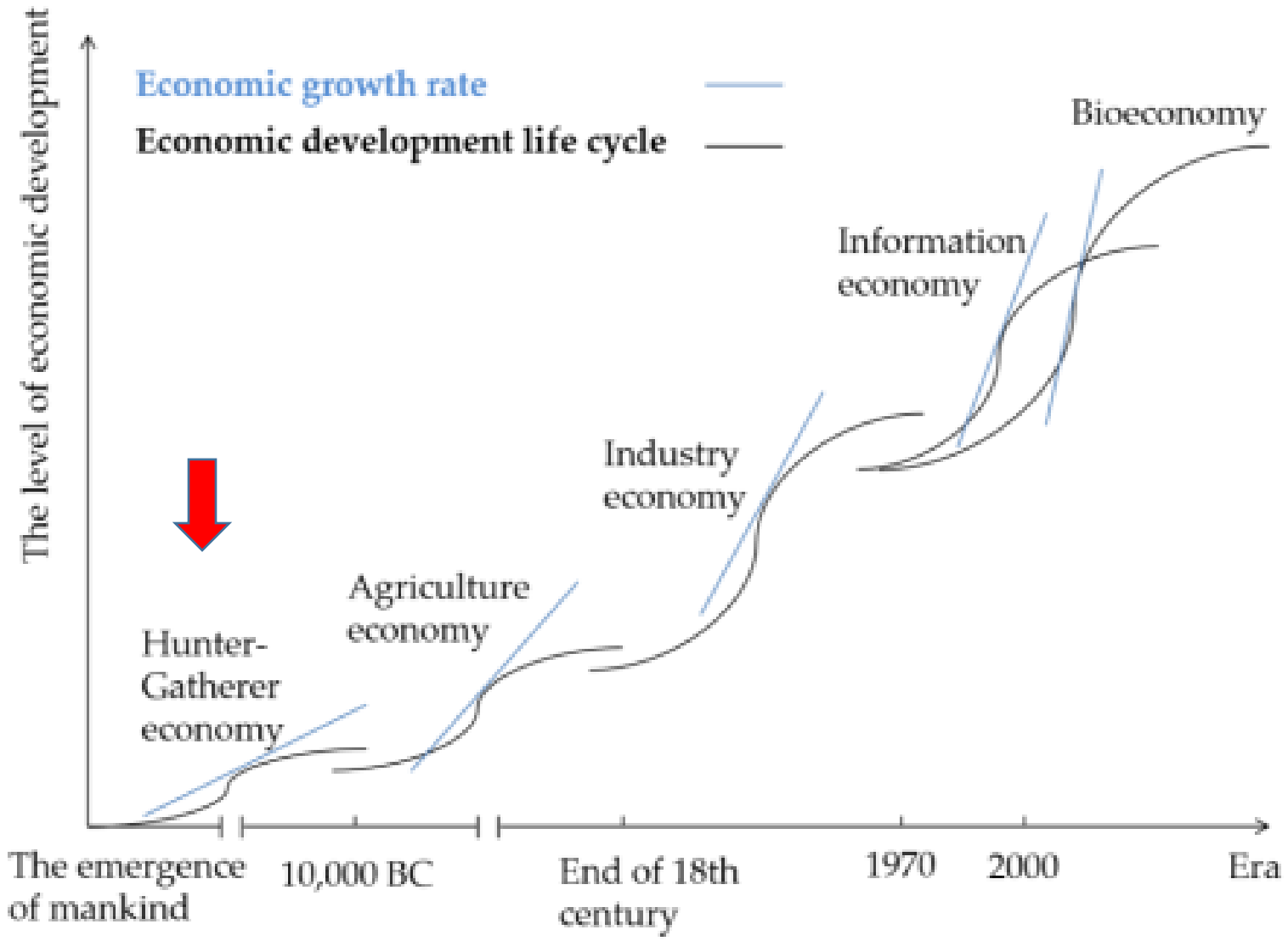

You cannot teach today the same way you did yesterday to prepare students for tomorrow.
JOHN DEWEY

Let us go back in History

Humans Evolved from a Garden

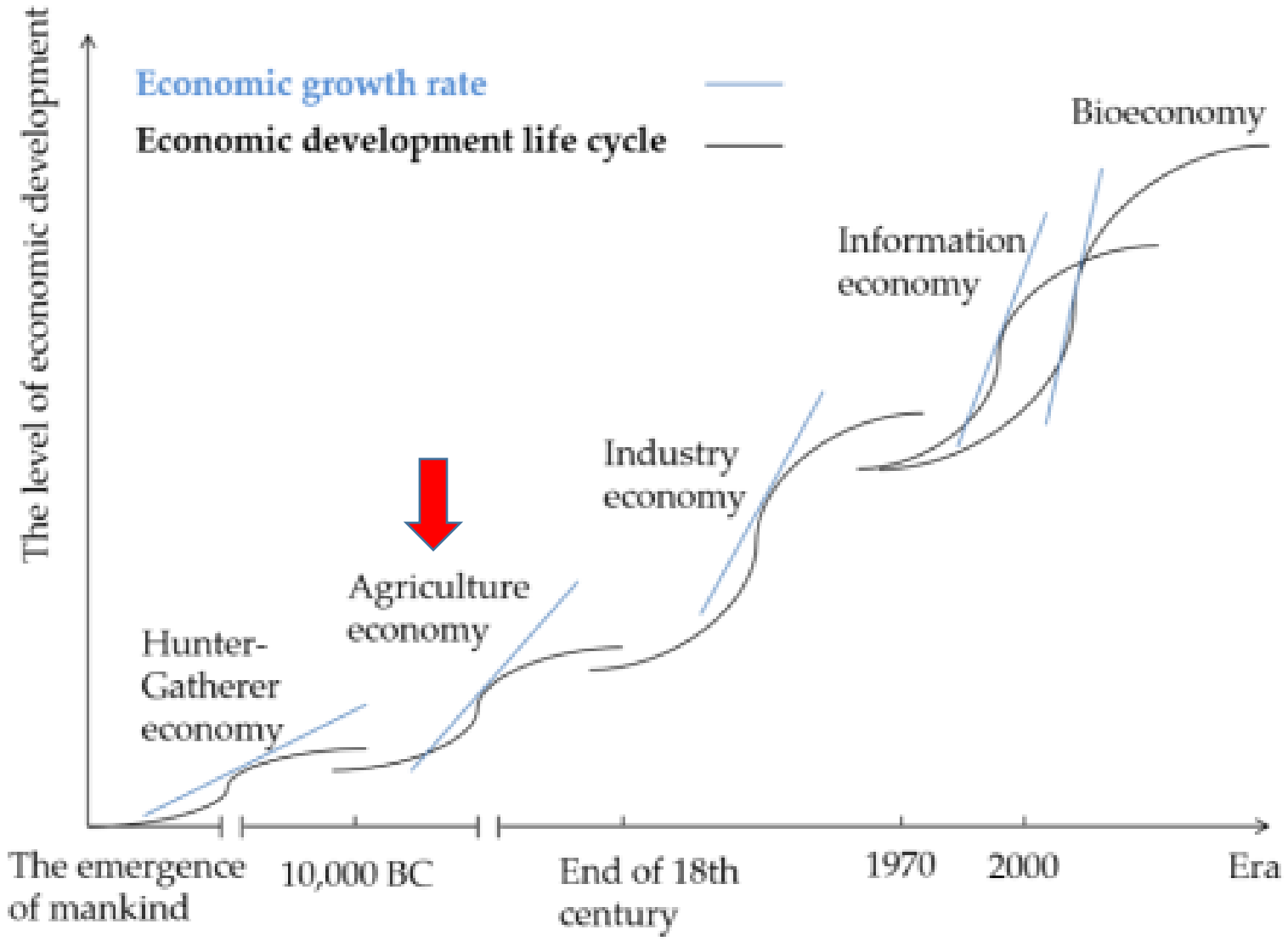


Then, human is one with nature = Harmony


Economic growth rate
Economic development life cycle
The level of economic development
Bioeconomy
Information economy
Industry economy
Agriculture economy
Hunter-Gatherer economy
The emergence of mankind
10,000 BC
End of 18th century
1970
2000
Era

Pre-Industrial Revolution: Hunter-Gatherer

BioTechnology Transitions with Economic Dev.



Pre-Industrial Revolution: 2. AGRICULTURAL ECONOMY

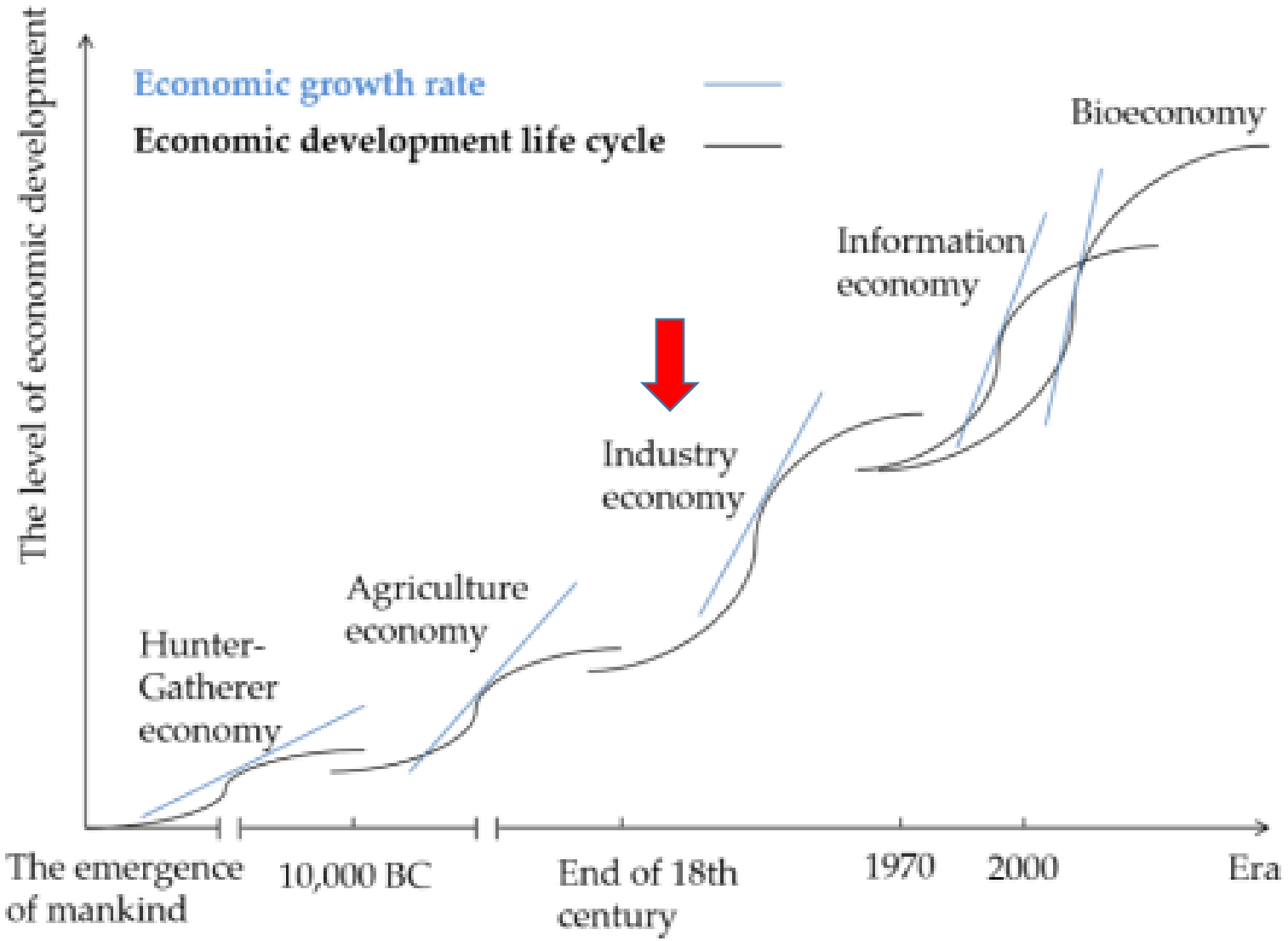
BIOTECH IDEAS:

1. Breeding Technology
2. Improved seeds
3. Mixed Cropping

LIFESTYLE ISSUES:

1. Water for Irrigation
2. Pesticides, fertilizer
3. Land Degradation

The Evolution



INDUSTRIAL REVOLUTION

BIOTECH IDEAS:

1. Large Scale Production
2. Improved Shelf life
3. Non-Biodegradable Alternatives

LIFESTYLE ISSUES:

1. Pollution
2. Wastes Generation
3. Environmental Effects

The Evolution of Emerging Technologies

Evolution of Technology-Cont'd

Can you see the timely change in each of this gadget?

Landlines: you call people from them. Usually one per household, maybe two but use the same line.

First mobiles: VERY expensive and VERY big. You can cell from them on the go.

Text messaging: you can keep in touch by sending text.

Picture Message: You can now send black and white pixelated images.

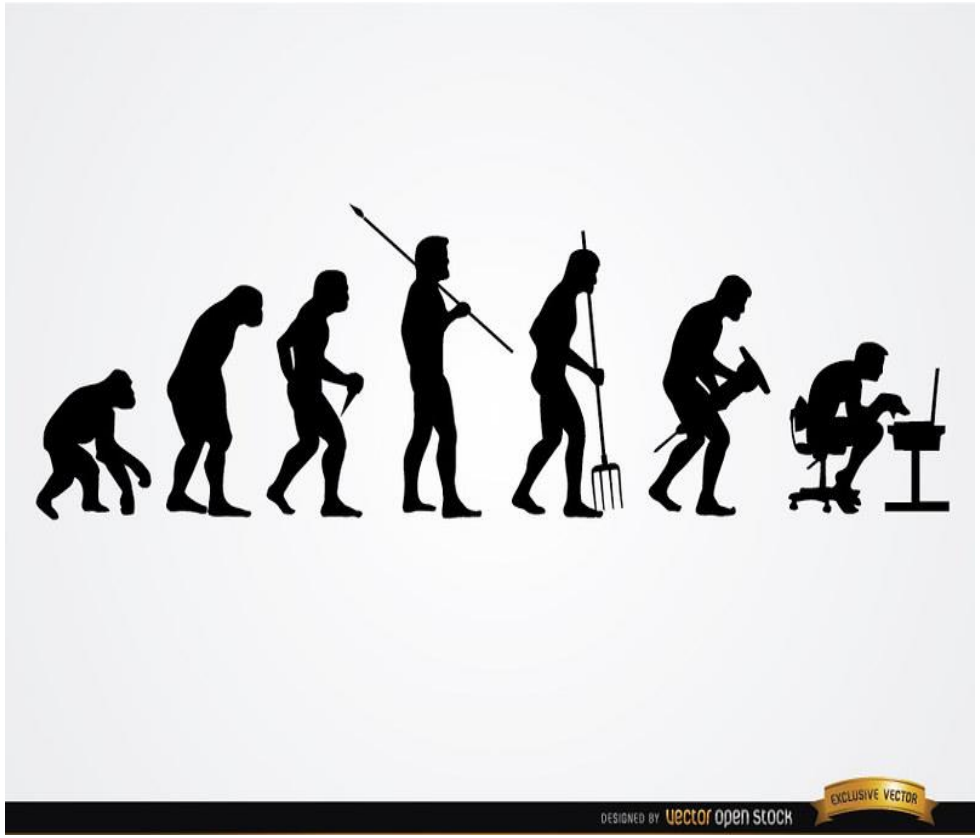
Colour: you have a tiny colour screen and cameras are starting to be used.

Cameras develop: Better quality images and you can send them to each other.

Everything: photos, music, internet, video calling, endless possibilies!

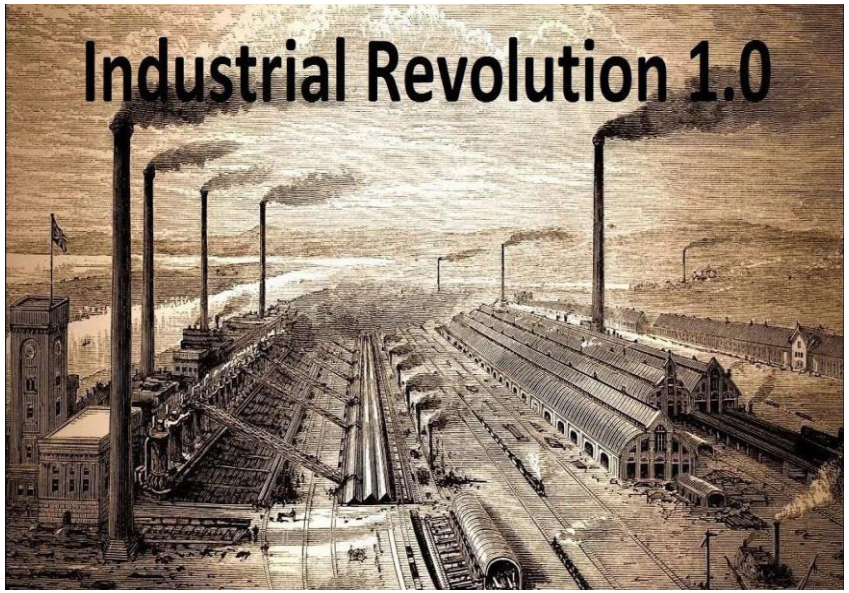
Evolution of Technology-Cont'd

Evolution is about a change in the manner and styles of doing things….



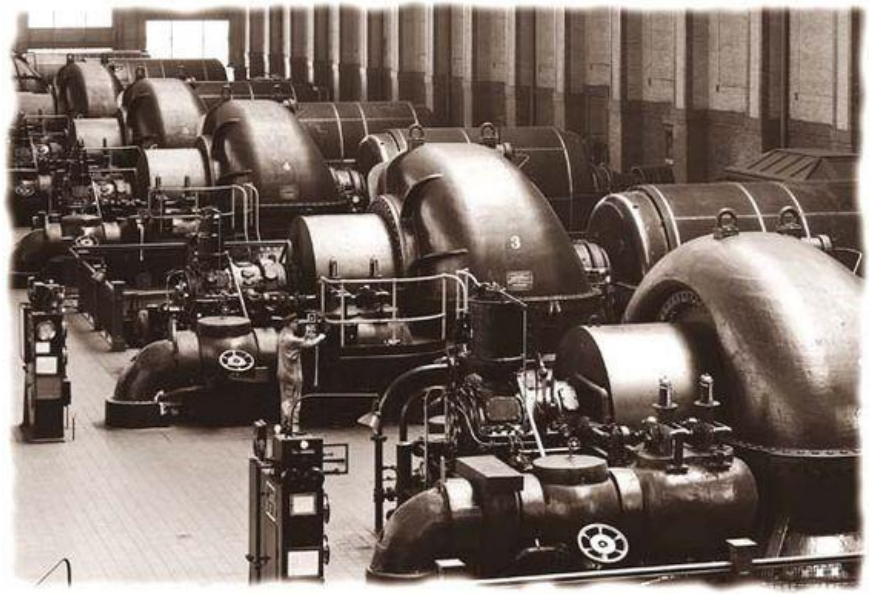
Industry 1.0-Mechanisation Revolution

- The First Industrial Revolution (IR 1.0), known as the Mechanisation Revolution, marked significant change with mechanical innovations using gears, levers, and cams to convert and transmit energy.
- This era, focusing on mechanical systems, was characterized by energy losses due to friction and inertia. IR 1.0 set the stage for future technological advancements by emphasizing mechanical energy and efficiency.



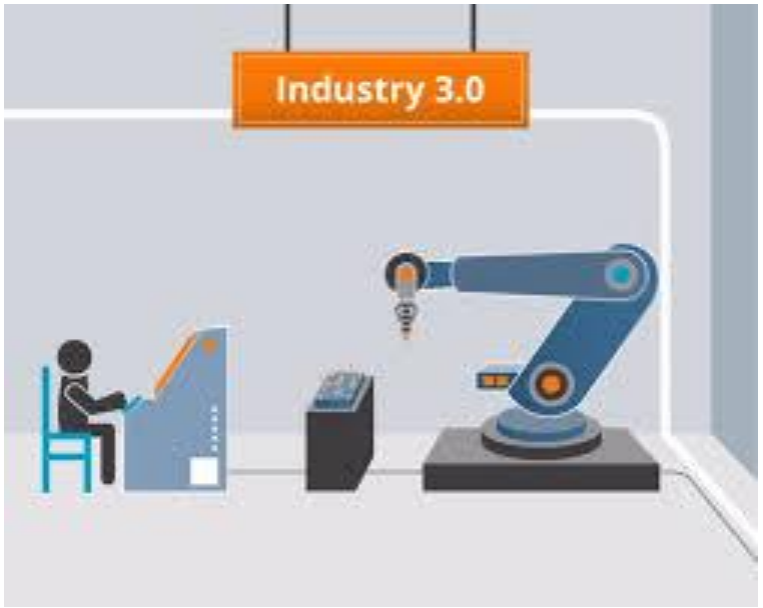
Industry 2.0-Semiconductor Revolution

- The Second Industrial Revolution (IR 2.0), or Semiconductor Revolution, improved on earlier limitations with integrated circuits enhancing system efficiency and performance.
- This era, from the late 19th to early 20th centuries, saw the miniaturization of mechanical systems into electromechanical systems, advancing electricity, mass production, and rapid industrialization, and is known as the Age of Science and Mass Production.



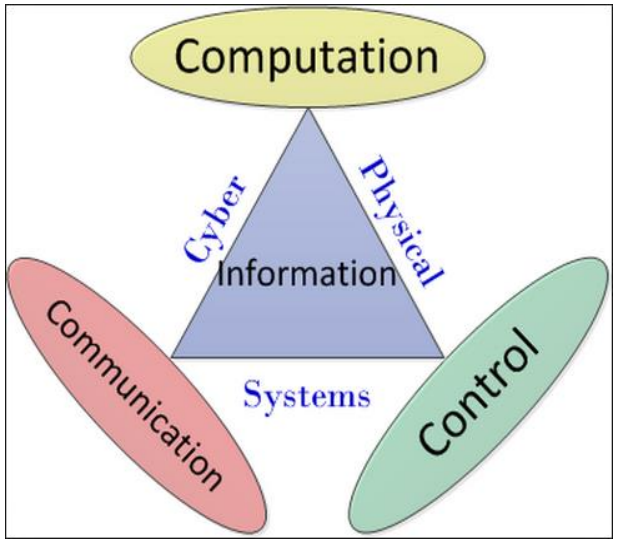
Industry 3.0-Information Revolution

- The Information Revolution (Industry 3.0), driven by Very Large-Scale Integration (VLSI) technology, introduced affordable microprocessors, microcontrollers, and microcomputers.
- Innovations like email and e-banking transformed communication and finance by enabling instant electronic messaging and online transactions.
- This era marked a major leap in technological progress, laying the groundwork for today's interconnected digital world.



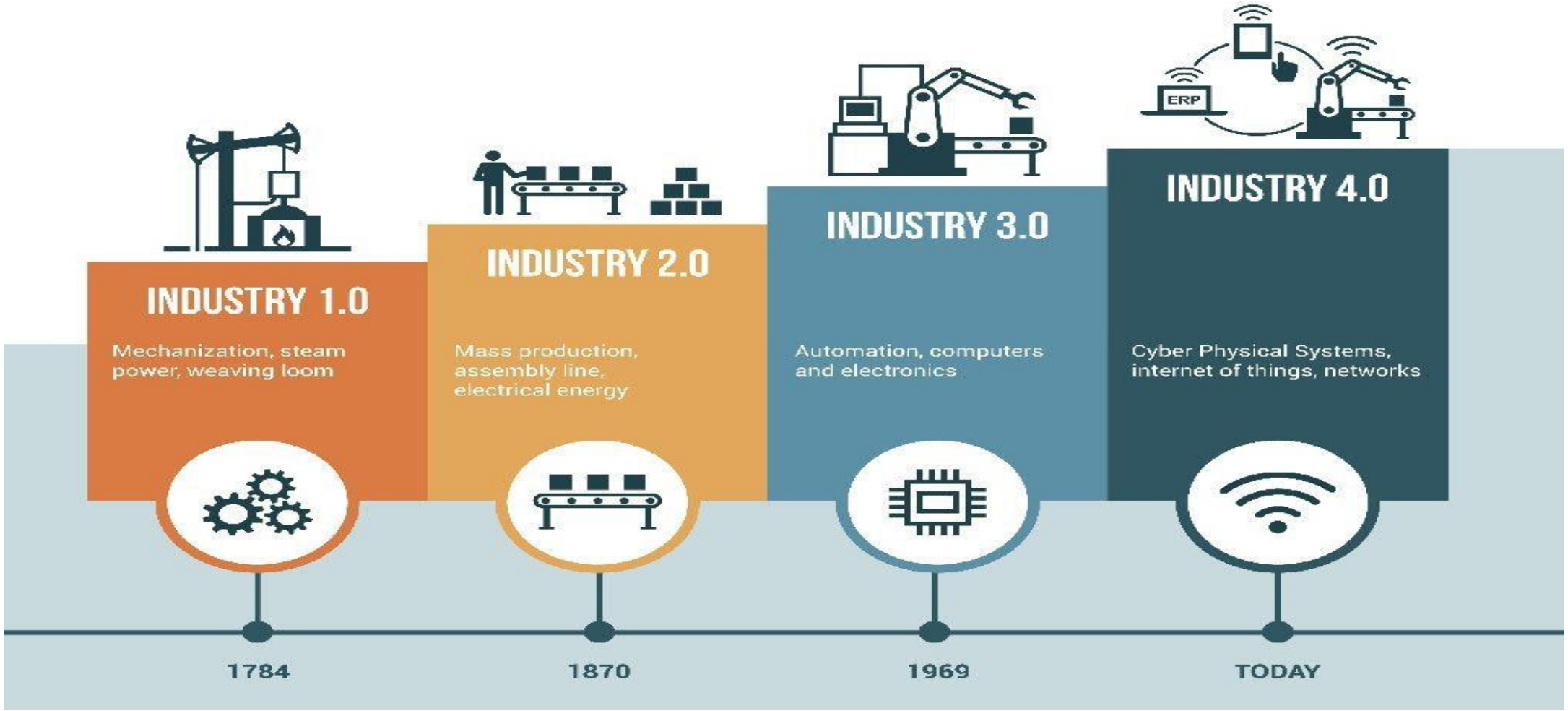
Industry 4.0: Principle and Definition

Cyber-Physical Systems (CPS)



- CPS is a system of collaborating computational elements controlling physical entities.
- CPS are physical and engineered systems whose operations are monitored, coordinated, controlled and integrated by a computing and communication core.
- They allow us to add capabilities to physical systems by merging computing and communication with physical processes.
- It is characterized by the integration of cutting-edge technologies.

The Fourth Industrial Revolution - How It Differs



Summary for the Industrial Revolutions

- The Industrial Revolution began with the first phase in the late 18th century, driven by the invention of steam power and mechanization, which transformed agriculture and textile production.
- The second revolution in the late 19th century introduced electricity and mass production, greatly enhancing manufacturing efficiency.
- The third revolution in the 20th century brought computers and automation, digitizing processes and improving productivity.
- Today, the fourth Industrial Revolution, characterized by artificial intelligence, the Internet of Things (IoT), and advanced robotics, is integrating digital, physical, and biological systems, reshaping industries and society.

Emerging Technologies

Emerging Technologies

- Emerging technologies refer to innovative advancements that are currently in the developmental stage but show the potential to significantly impact various aspects of society.
- These technologies often represent groundbreaking shifts in fields such as science, engineering, and computing, and they hold promise for transforming industries, improving efficiency, and addressing complex challenges.

Emerging Technologies

- Emerging technologies are cutting-edge innovations that are in the early stages of development and are expected to have a significant impact on society, economy, and industries.
- These technologies are rapidly evolving and have the potential to revolutionize sectors like healthcare, energy, agriculture, and manufacturing.

Key Characteristics of Emerging Technologies

❑**Disruptive:**

- They challenge traditional models and processes.

❑**Interdisciplinary:**

- Often combine advancements in multiple fields such as computing, biology, and physics.

Key Characteristics of Emerging Technologies

❑**Uncertain Impact:**

- Still under development, so their full effects on industries and society are not yet fully known.

❑**High Research and Investment:**

- Governments, organizations, and institutions are investing heavily in these technologies for their potential future benefits.

List of Emerging Technologies

A non-exhaustive list of transformative emerging technologies

1. **Artificial Intelligence**
2. Robotics and Autonomous Systems
3. Blockchain and Distributed Ledger Technology
4. Quantum Computing
5. Nanotechnology
6. Renewable Energy Technologies
9. Internet of Things (IoT) and Edge Computing
10. Augmented Reality (AR) and Virtual Reality (VR)
11. Biotechnology and Genetic Engineering
12. 3D Printing/Additive Manufacturing
13. Advanced Healthcare Technologies

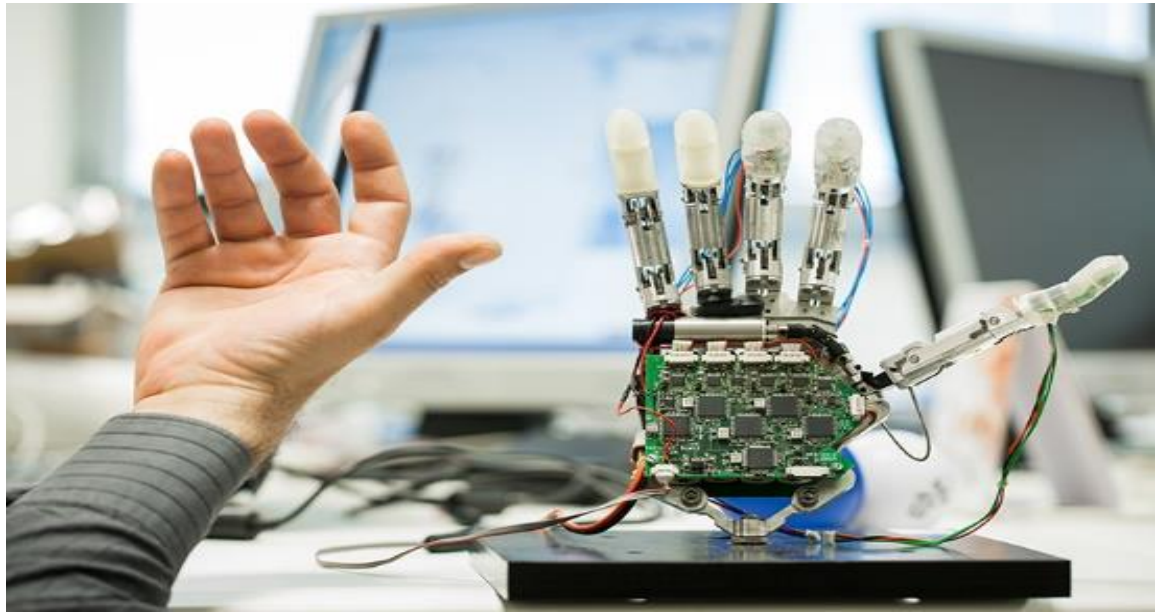
Emerging technologies represent a wide array of new and developing innovations, Industry 4.0 technologies are a subset of these that are focused specifically on revolutionizing industrial and manufacturing processes.

Artificial Intelligence

Artificial Intelligence Definition

Simply put:

Artificial + Intelligence = Artificial Intelligence

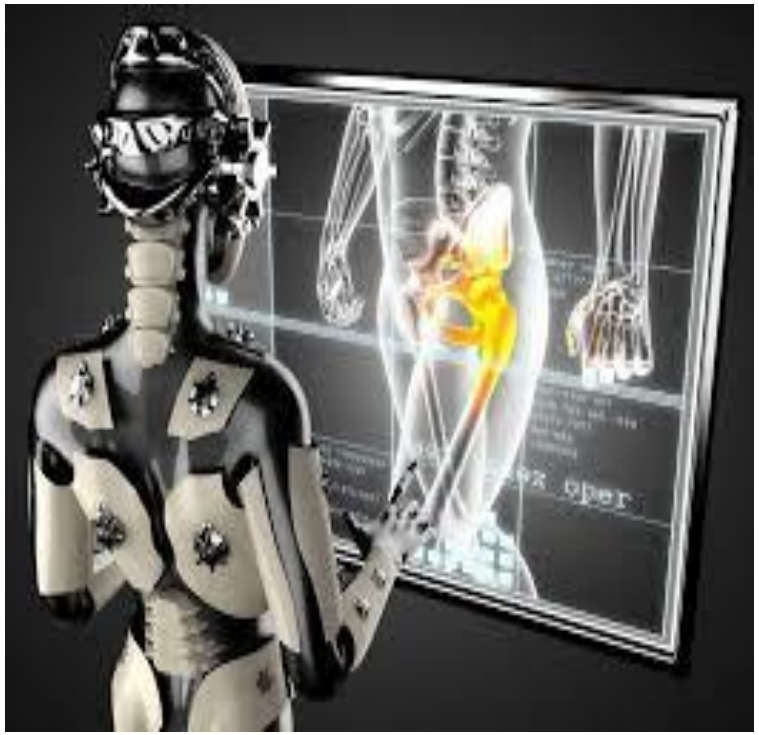


What is Artificial Intelligence (AI)?

- **Artificial Intelligence (AI)** is the transfer of intelligence in man to machine.
- It is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings.
- The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience (Encyclopedia Britannica).

What is Artificial Intelligence?

- **"A way of making a computer, a computer-controlled robot, or a software think intelligently, in the similar manner the intelligent humans think"**



- "The art of creating machines that perform functions that require intelligence when performed by people."

- "The study of how to make computers do things at which, at the moment, people are better at."

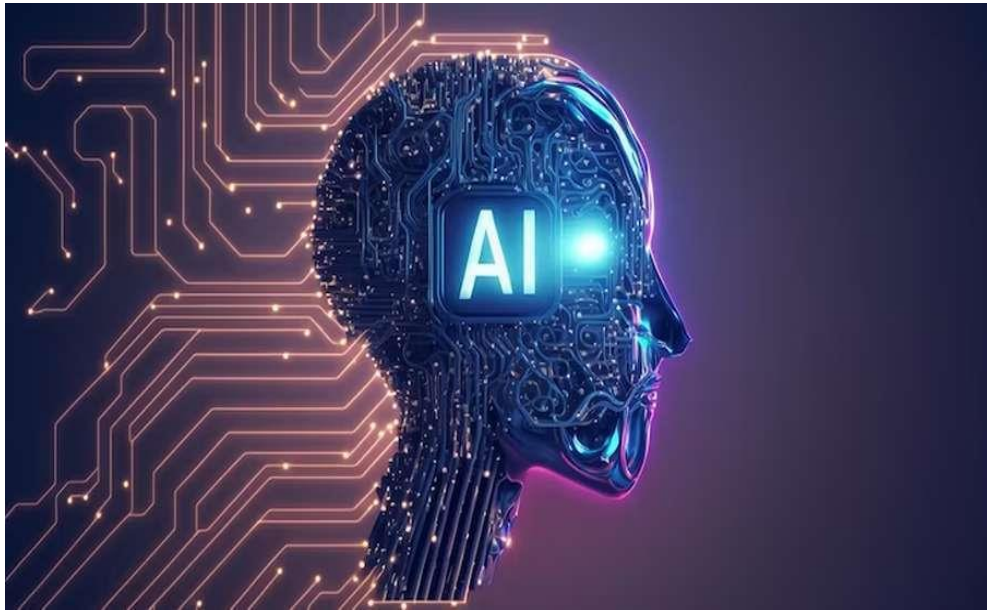
What is Artificial Intelligence (AI)

- **AI** enables computers to think, learn, and make decisions like humans, but at a lightning-fast pace.

So why is it such a big deal?

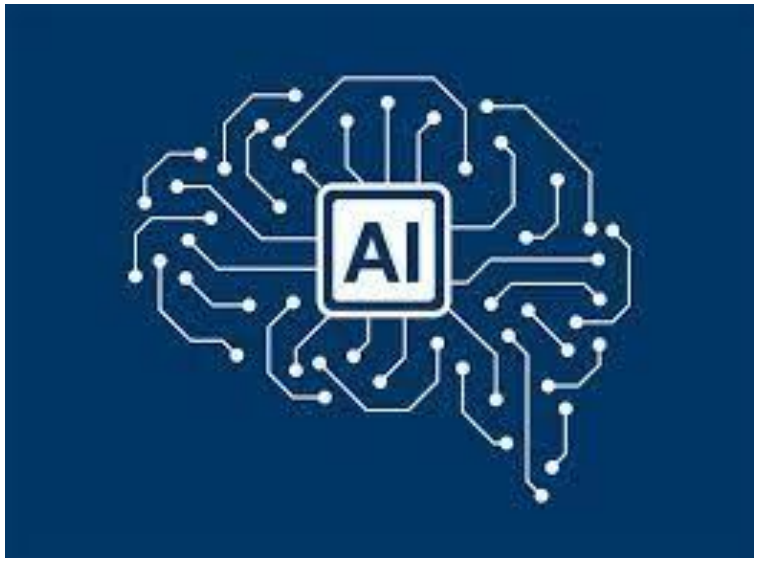
- Its significance lies in its capacity to augment human capabilities, automate routine tasks, improve decision-making, and pave the way for innovative solutions to complex problems.

- In essence, AI is the engine driving the digital transformation of businesses and industries worldwide.



Artificial Intelligence Techniques

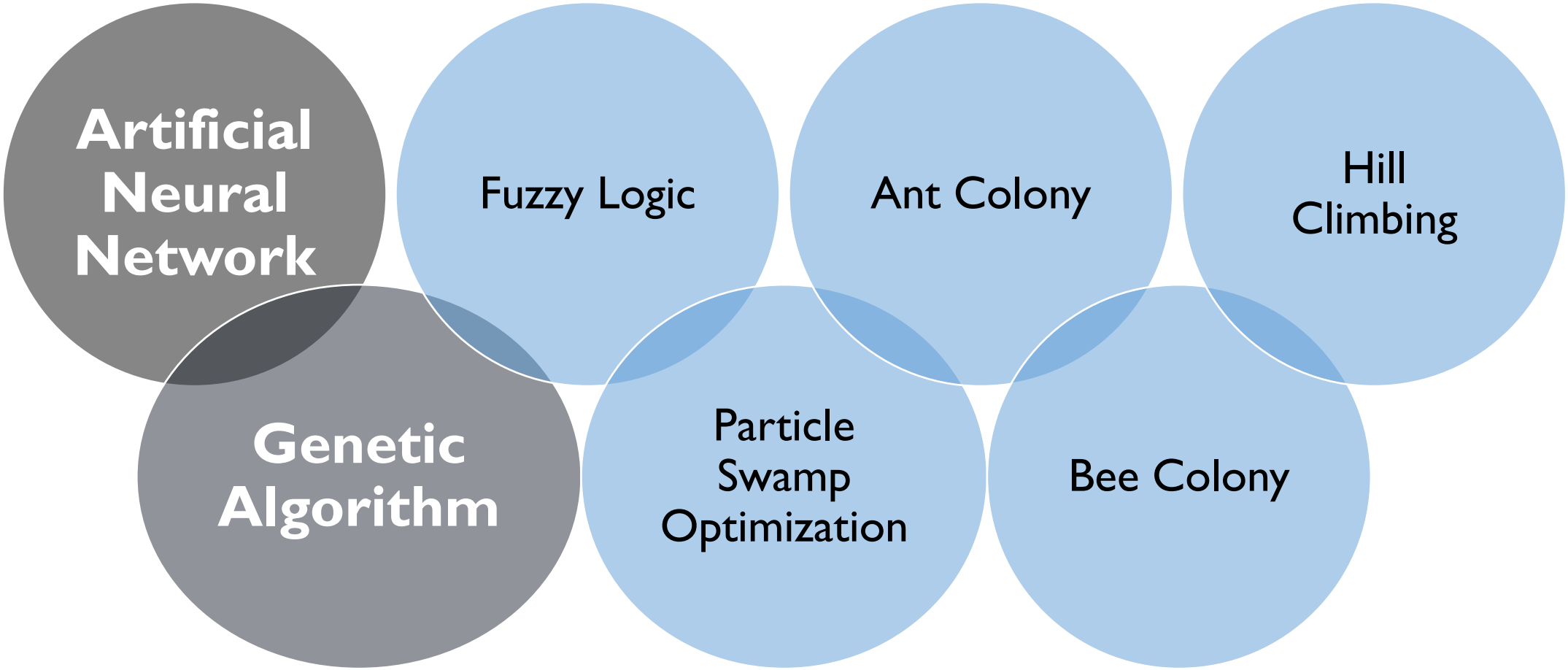
Artificial intelligence generally involves borrowing characteristics from human intelligence (and natural intelligence), and applying them as algorithms in a computer friendly way.



Some AI approaches:

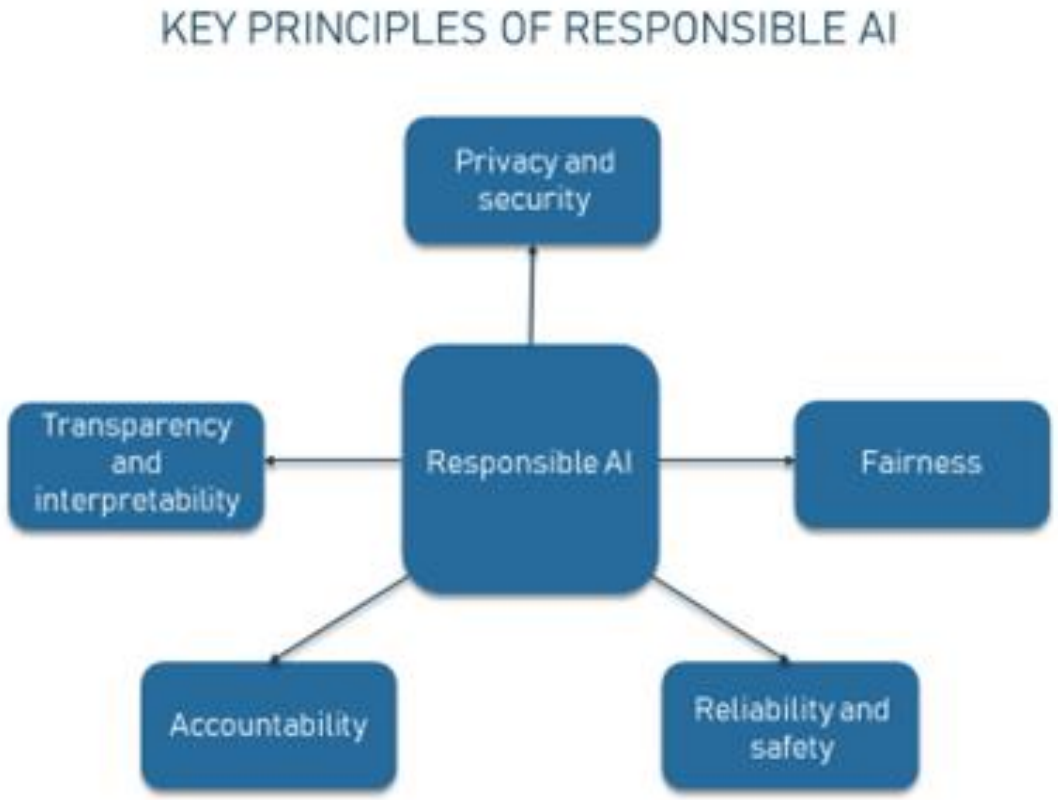
- Fuzzy logic
- Artificial neural network
- Evolutionary computation (genetic algorithm)
- Artificial Immune System
- Swarm Intelligent

Artificial Intelligence: Some of the Known Techniques



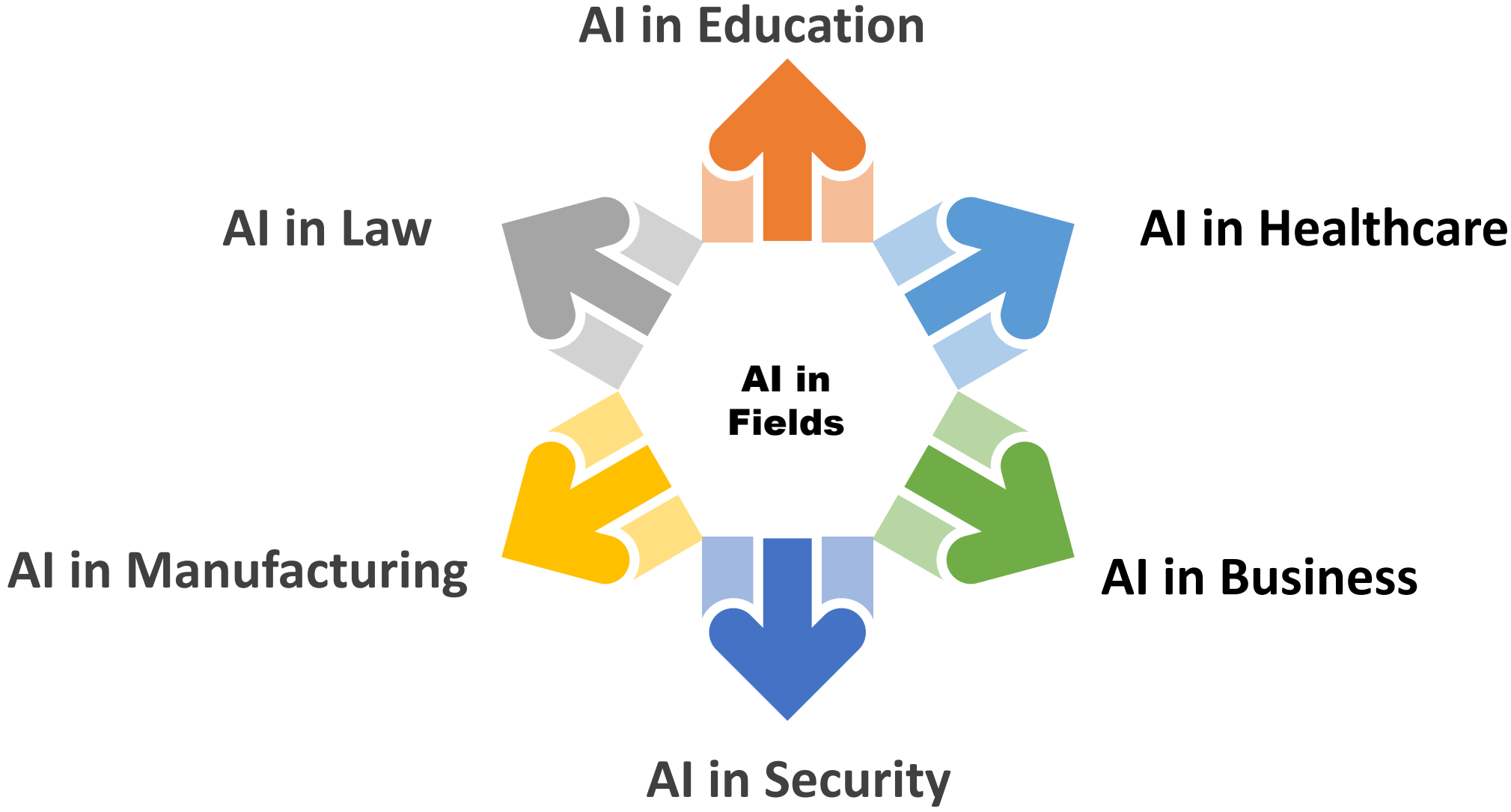
What is Responsible AI?

Responsible AI is the practice of designing, developing, and deploying AI with good intention to empower employees and businesses, and fairly impact customers and society—allowing companies to engender trust and scale AI with confidence.



Responsible AI is a new topic of AI governance, with the phrase "responsible" serving as a catch-all term that encompasses both ethics and democratization.

Application Of AI in Various Fields



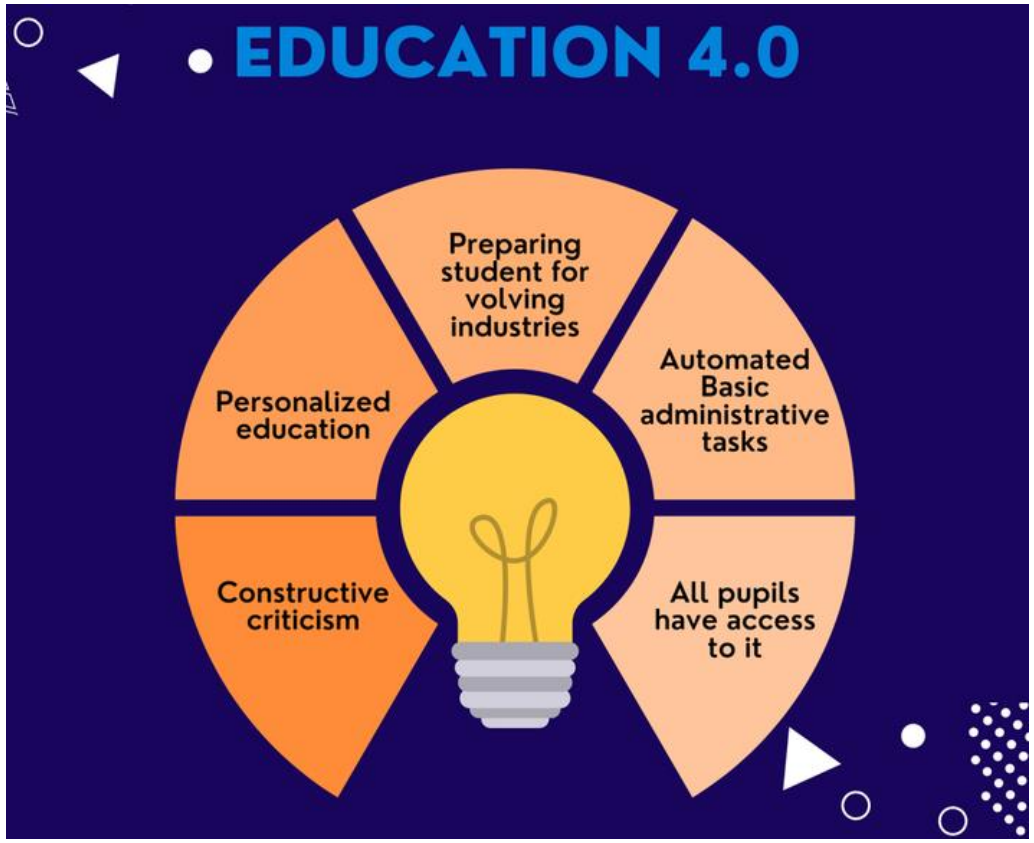
Summary for the Emerging Technology

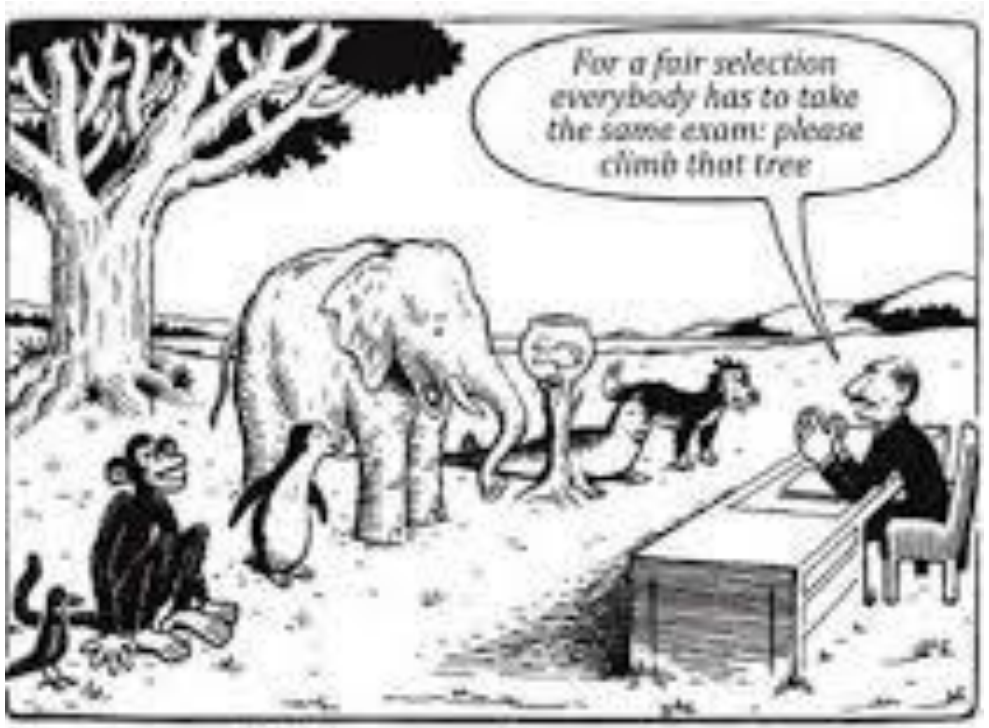
- Emerging technologies are transforming education by enabling innovative, efficient, and personalized learning experiences.
- Through tools like artificial intelligence, virtual reality, and data analytics, educators can tailor instruction to meet individual student needs, improving engagement and outcomes.
- These technologies not only prepare students for the digital economy but also equip them with critical skills for problem-solving, collaboration, and adaptability.
- By integrating emerging technologies, education systems can enhance access, promote lifelong learning, and contribute to sustainable development, ensuring students are well-prepared for future societal and workforce demands.

Education 4.0

Education 4.0

- Education 4.0 mirrors Industry 4.0's transformative impact, revolutionizing how education is delivered.
- Advanced tech redefines traditional models, equipping learners for 21st-century challenges and opportunities.



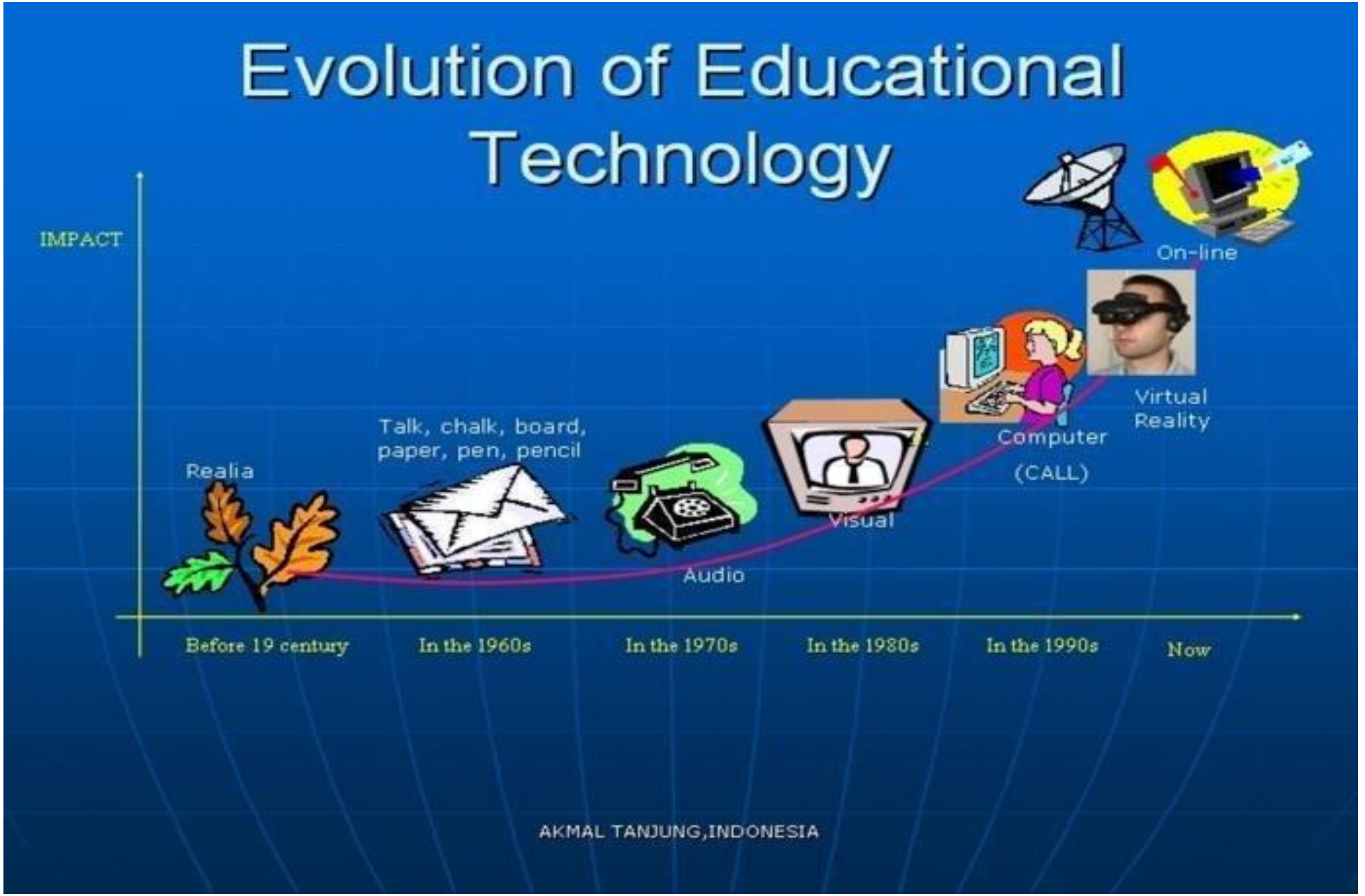


Our Education System

"Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid."

- Albert Einstein

Evolution of Education 4.0


Evolution of Educational Technology
IMPACT
Realia
Talk, chalk, board, paper, pen, pencil
Audio
Visual
Computer (CALL)
Virtual Reality
On-line
Before 19 century
In the 1960s
In the 1970s
In the 1980s
In the 1990s
Now
AKMAL TANJUNG,INDONESIA

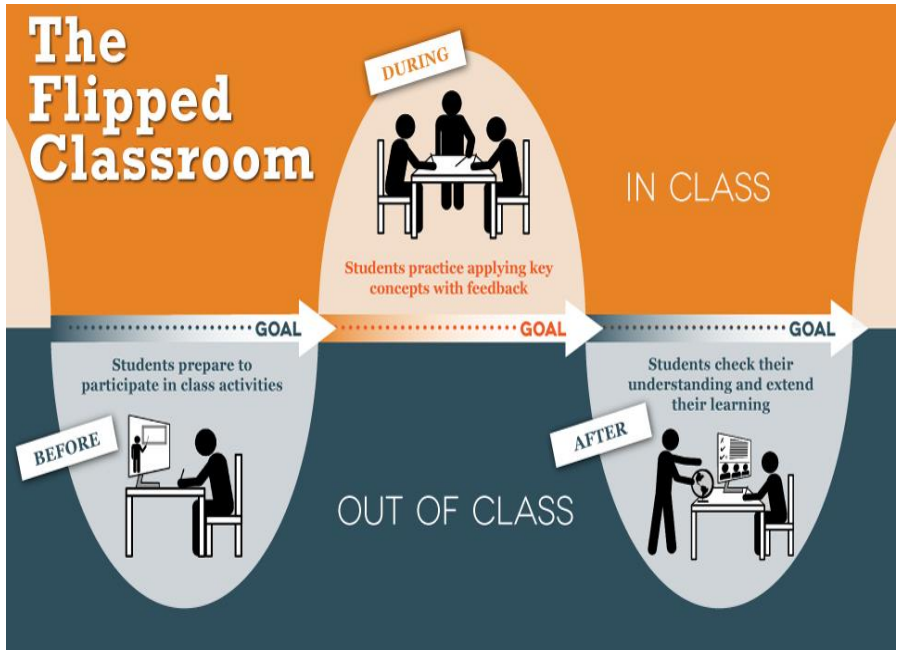
Key Features of Education 4.0

- **Personalized Learning:**
- Education 4.0 customizes learning for individuals using adaptive tech and AI-driven platforms.

- **Technology Integration:**
- AI, VR, AR, and blockchain enhance learning with engagement and knowledge retention.

Key Features of Education 4.0

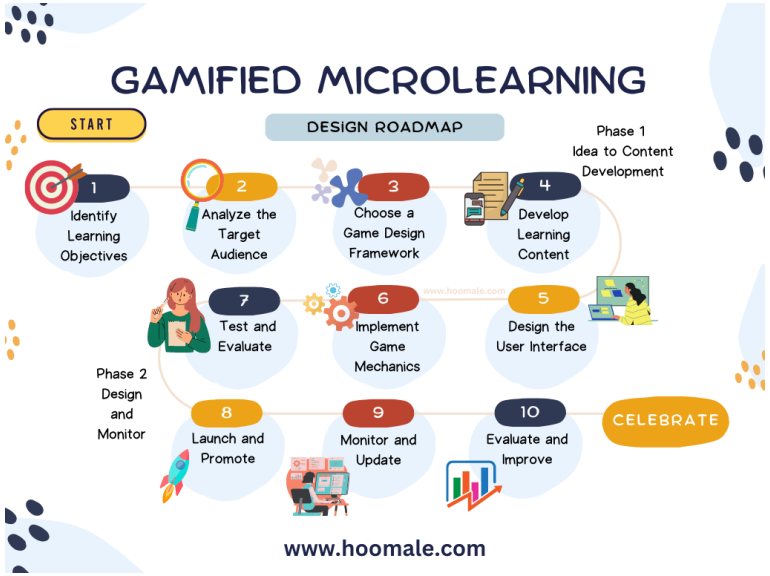
- **Flipped Classroom:**
- Pre-class learning, in-class interaction, discussions, and problem-solving activities.



- **AI-Powered Tutoring and Assessment:**
- AI tools offer personalized tutoring, feedback, and assessments for immediate, tailored learner support.

Key Features of Education 4.0

- **Gamification and Microlearning:**
- Gamification adds game-like elements for engagement, while microlearning delivers content in short bursts for better retention.



- **Global Learning Networks:**
- Technology fosters global connections, aiding learners in comprehending diverse cultures and perspectives.

Role of Artificial Intelligence in Education

Personalized Learning Experiences

❑Tailored Educational Content:

- Artificial intelligence algorithms analyze student data to create customized learning paths.

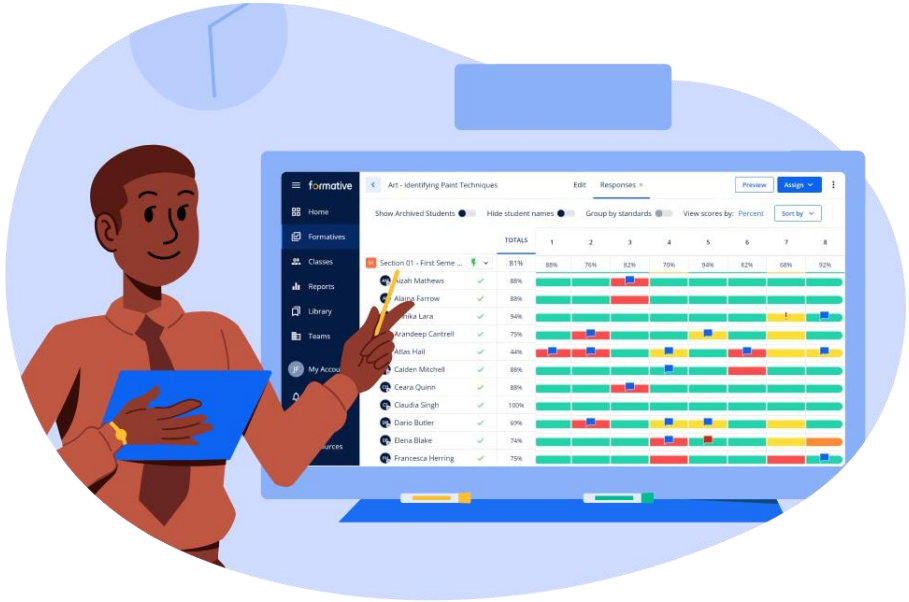
❑Dynamic Learning Environments:

- Students receive resources and activities aligned with their interests and skill levels, fostering engagement.

Adaptive Learning Technologies

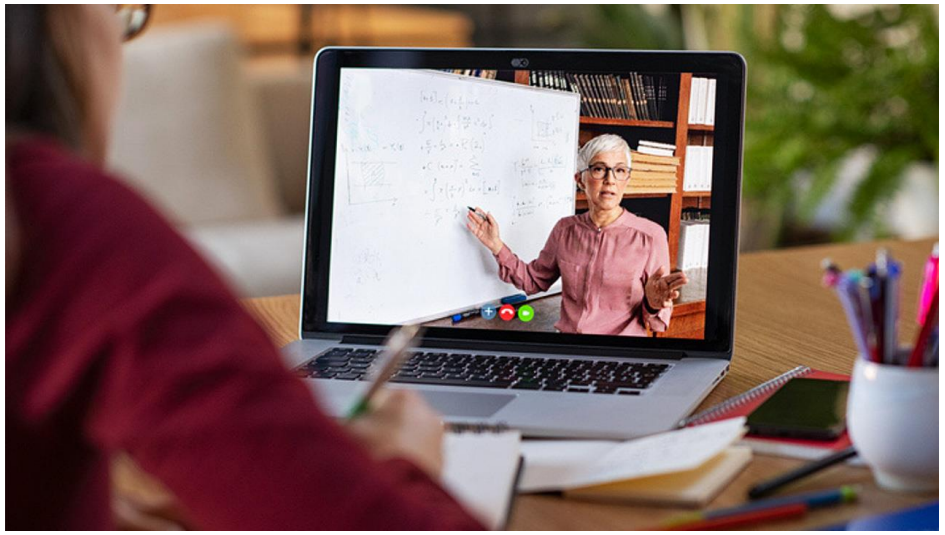
❑Real-Time Assessment:

- Continuous monitoring of student performance allows for immediate adjustments to instructional strategies.



❑Individual Learning Pace:

- Students can progress through materials at their own speed, promoting mastery before advancing.



Support for Diverse Learning Styles

❑Multimodal Learning:

- Artificial intelligence tools provide various formats (text, video, interactive simulations) to cater to different learning preferences.

❑Language Support:

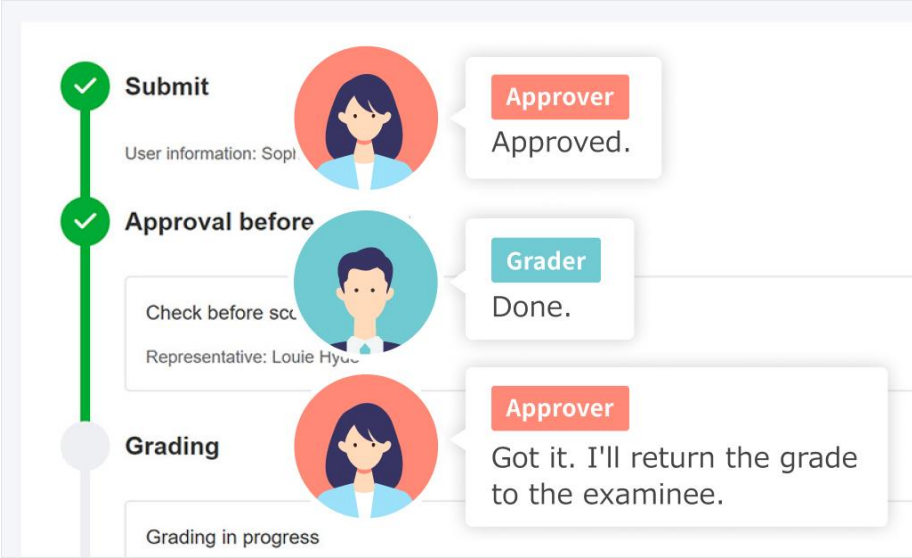
- Tools offering translation and language assistance help non-native speakers grasp concepts more easily.

Enhancing Instruction with Artificial Intelligence

Automation of Administrative Tasks

❑Streamlining Grading:

- Provides quick feedback, allowing educators to focus on instruction rather than administrative duties.



❑Course Management:

- Tools that manage scheduling, attendance, and communication between students and educators.

Data-Driven Insights for Educators

❑Analytics and Reporting:

- Educators can use these insights to modify instruction and provide targeted support where needed.

❑Professional Development:

- Artificial intelligence can suggest tailored professional development resources for educators based on classroom challenges.

Benefits of Artificial Intelligence in Learning

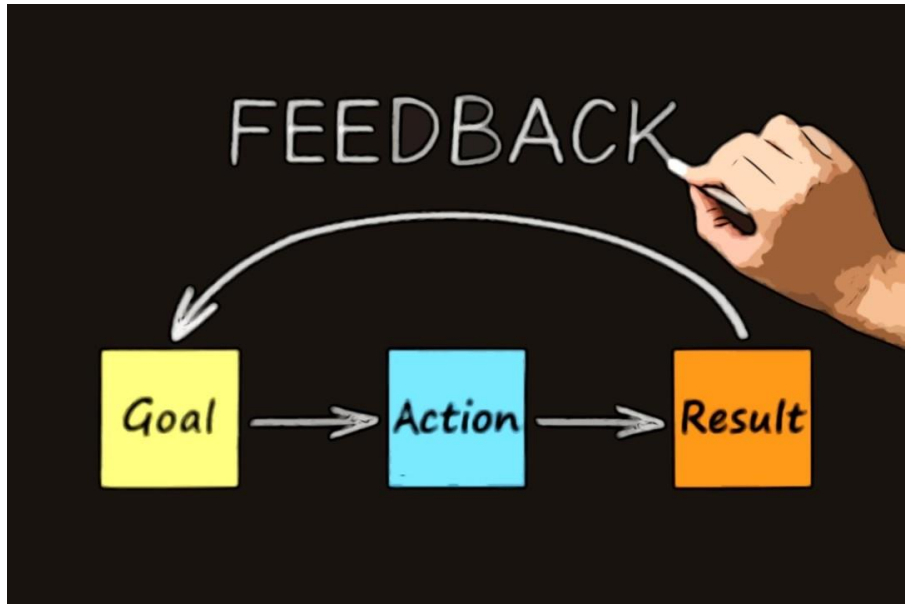
Improved Engagement

❑**Interactive Learning Environments:**

- Artificial intelligence technologies create immersive experiences, such as virtual simulations and gamified lessons.

❑**Immediate Feedback:**

- Real-time responses to student actions enhance engagement, allowing learners to adjust their strategies on the spot.



Access to Resources

❑Vast Educational Content:

- Artificial intelligence platforms provide access to a wealth of resources, including videos, articles, and interactive tools tailored to various subjects.

❑24/7 Availability:

- Learning resources are available anytime and anywhere, allowing students to learn at their convenience.

Enhanced Collaboration

❑Facilitated Communication:

- Artificial intelligence tools promote teamwork by connecting students with peers and educators through collaborative platforms.

❑Peer Learning:

- Encourages collaborative projects and discussions, leveraging artificial intelligence to match students with similar interests or complementary skills.

Case Studies

Summit University, Offa

❑AI Integration:

- Summit University has integrated Artificial Intelligence (AI) into its curriculum and research initiatives.
- The university emphasizes the use of AI in enhancing learning outcomes and research capabilities.

❑Success Story:

- The university's AI-driven research projects and initiatives have contributed to advancements in various fields.
- It has also developed partnerships with tech companies to provide AI resources and training.

Summit University, Offa

- Summit University, Offa offers a diverse skill set to students, including financial literacy, clean and renewable energy, family and leadership, artificial intelligence and ICT, acadopreneurship, history and storytelling, and global citizenship.
- These skills prepare students to excel in various fields, contribute to society, and adapt to a rapidly evolving world.

University of Lagos (UNILAG)

❑AI Integration:

- UNILAG has incorporated Artificial Intelligence (AI) into its computer science and engineering programs.

❑Success Story:

- The university has developed AI-based solutions for local challenges, such as traffic management and healthcare.
- Notable projects include AI-driven systems for predicting traffic patterns and optimizing transportation logistics.

Obafemi Awolowo University (OAU)

❑**AI Integration:**

- OAU has embraced Artificial Intelligence (AI) in its research and academic programs, particularly in the fields of computer science and engineering.

❑**Success Story:**

- The university's AI research group has developed innovative solutions in areas such as natural language processing and robotics. OAU's AI research has been recognized for its contributions to local and international

Challenges and Considerations

Equity and Access

❑Digital Divide:

- Not all students have equal access to technology and the internet, which can widen educational disparities.

❑Inclusivity:

- Ensuring artificial intelligence solutions cater to diverse student needs, including those with disabilities.

Data Privacy and Security

❑Concerns Over Student Data:

- The collection and analysis of student data raise questions about privacy and consent.

❑Cybersecurity Threats:

- Educational institutions must invest in cybersecurity measures to safeguard sensitive data against breaches.

Dependency on Technology

❑**Over-Reliance on Artificial Intelligence:**

- Potential for students to become overly dependent on artificial intelligence for learning, hindering critical thinking and problem-solving skills.

❑**Balancing Technology with Traditional Methods:**

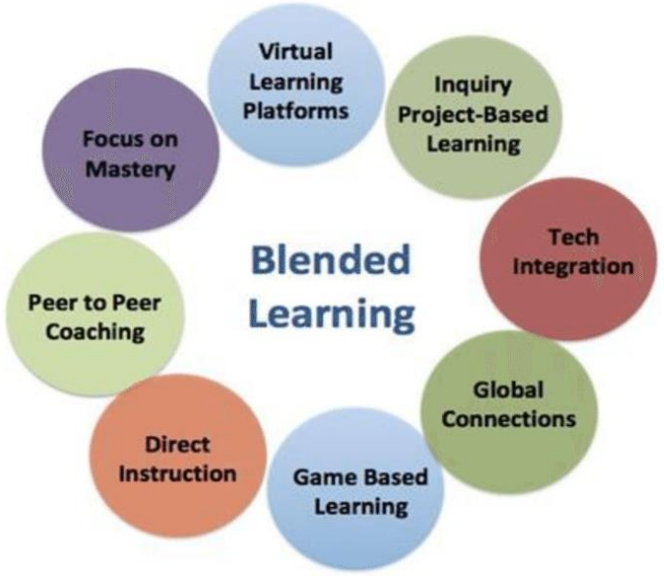
- Importance of integrating artificial intelligence with traditional instructional methods to ensure well-rounded education.

The Future of Learning and Instruction with Artificial Intelligence

Innovative Learning Environments

❑Blended Learning Models:

- Integration of artificial intelligence with traditional classroom settings to create hybrid learning experiences.



❑Virtual Reality and Augmented Reality:

- Use of immersive technologies to enhance learning experiences, enabling students to explore concepts in interactive 3D environments.

Lifelong Learning and Continuous Improvement

❑Emphasis on Lifelong Learning:

- Artificial intelligence supports learners of all ages by providing access to educational resources tailored to evolving career needs.

❑Continuous Feedback Loops:

- Artificial intelligence systems continuously assess student performance, promoting a culture of ongoing improvement and adaptation in learning.

Personalized Learning Pathways

❑Dynamic Curriculum Development:

- Artificial intelligence enables the creation of dynamic curricula that evolve based on student interests, learning progress, and workforce demands.

❑Career Pathway Alignment:

- Educational programs can be tailored to align with emerging job markets, ensuring students acquire relevant skills for future careers.

What We Have Done

Moodle Learning Management System (LMS) for Classrooms and Examinations

- Moodle LMS has transformed how we manage and deliver courses.
- By offering a centralized platform, we can upload lecture materials, assignments, and additional resources, ensuring students can access course content anytime and anywhere.
- This flexibility has significantly improved student engagement, as they can revisit materials at their own pace and on their schedule.

Clean Energy as a Course

- The Clean Energy course has been instrumental in educating students about sustainable energy solutions.
- Through this course, we explored various forms of renewable energy, such as solar, wind, and hydropower, as well as the importance of reducing reliance on fossil fuels.
- This has significantly raised awareness among students about the environmental impact of energy consumption and the need for cleaner

Financial Literacy as a Course

- The Financial Literacy course provided essential knowledge on managing personal finances, budgeting, saving, and investing.
- It emphasized the importance of financial discipline and planning, especially for students preparing to enter the workforce.
- This foundational understanding is crucial for making informed financial decisions in the future.

Some of Our Research Work

1. Multiple Operators Enabled SIM Card
2. Intelligent Walking Stick
3. Intelligent Phone
4. Pico- LED
5. Power Bag and Fuel-Less Generator
6. Autonomous Vehicle
7. Laboratory Training Kits
8. Intelligent Vision for Pipeline Monitoring
9. Road Accident Prevent Manifest
10. Learning Management Development: SabiMoni and SME Sabi
11. Content Development for Learning and Training

Multiple Operators Enabled SIM Card and Phone

Multiple Operators Enabled SIM (MOES) Card

Why do you need two or more phones ?

Why the need for more than one SIM card slot on your phone?

Why “porting” your number?

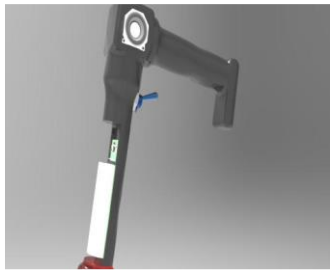
Multiple Operators Enabled SIM (MOES) Card

MOES – The solution;
One SIM card, all networks.

Multiple Operators Enabled SIM (MOES) Card

- Card Information Extraction Software and
- Hybrid AI System for Handover in MOES
- tion of Cognitive Mobile Phone and Evaluation of

The Intelligent Walking Stick



Electronic section of IWS

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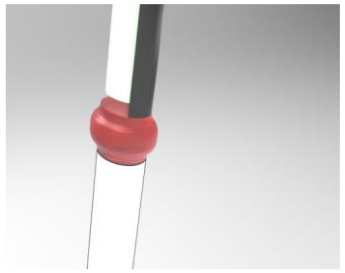

Seamless Mechanical joint

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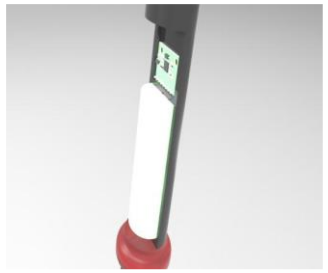

Fall detection Algorithm

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The angular system with Loudspeaker

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IWS flash light

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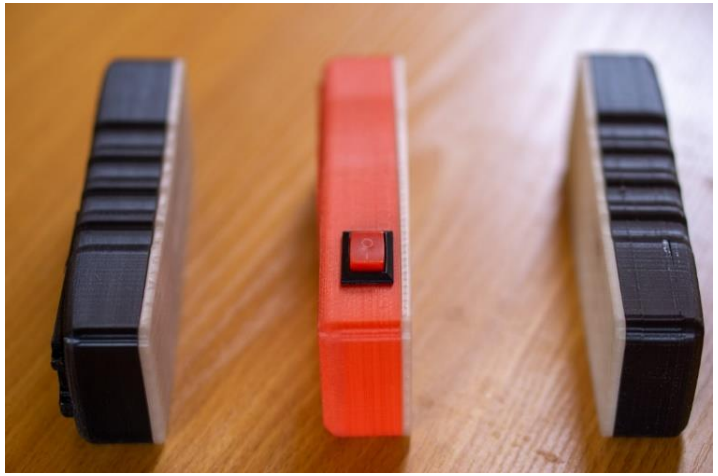
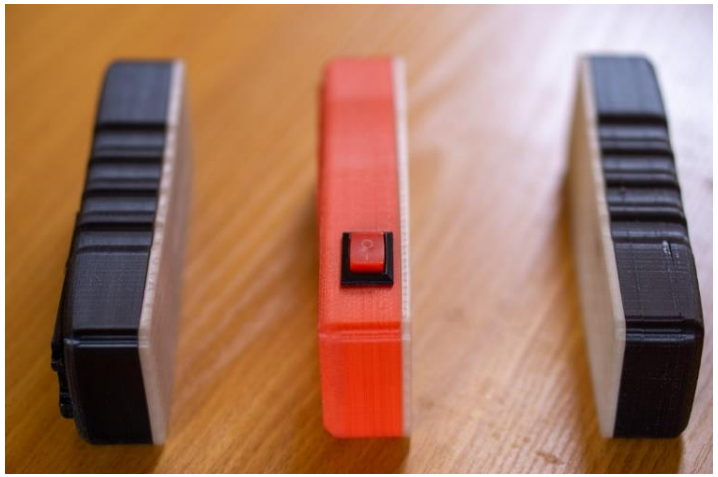
IWS at rest

IWS in use

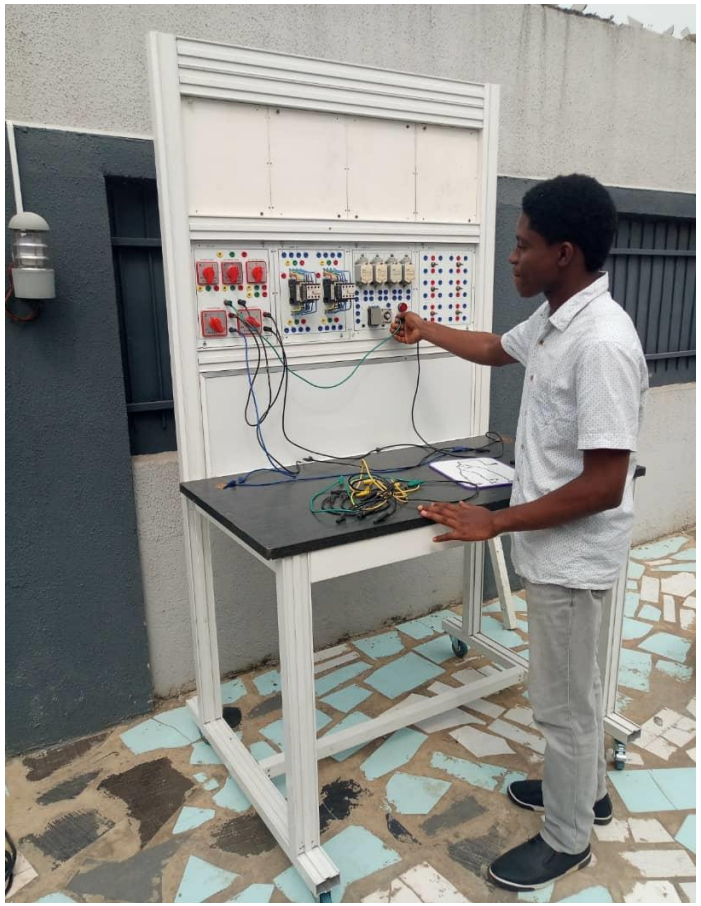
Typical GIA Linkages Outcome: Joint Products Development





Laboratory Training Modules

Typical GIA Linkages Outcome: Joint Products Development



Recommendation

Recommendation

❑ **Invest in Artificial Intelligence (AI) Infrastructure for Education:**

- Establish funding and resources to integrate AI tools and infrastructure in educational institutions across all regions, ensuring equal access to advanced learning technologies and supporting the democratization of AI in education.

❑**Develop Artificial Intelligence (AI) Literacy and Training for Educators and Students:**

- Implement nationwide training programs to equip educators and students with AI literacy, empowering them to understand, use, and even create AI-driven tools, thereby promoting a more inclusive and informed AI ecosystem.

Recommendation

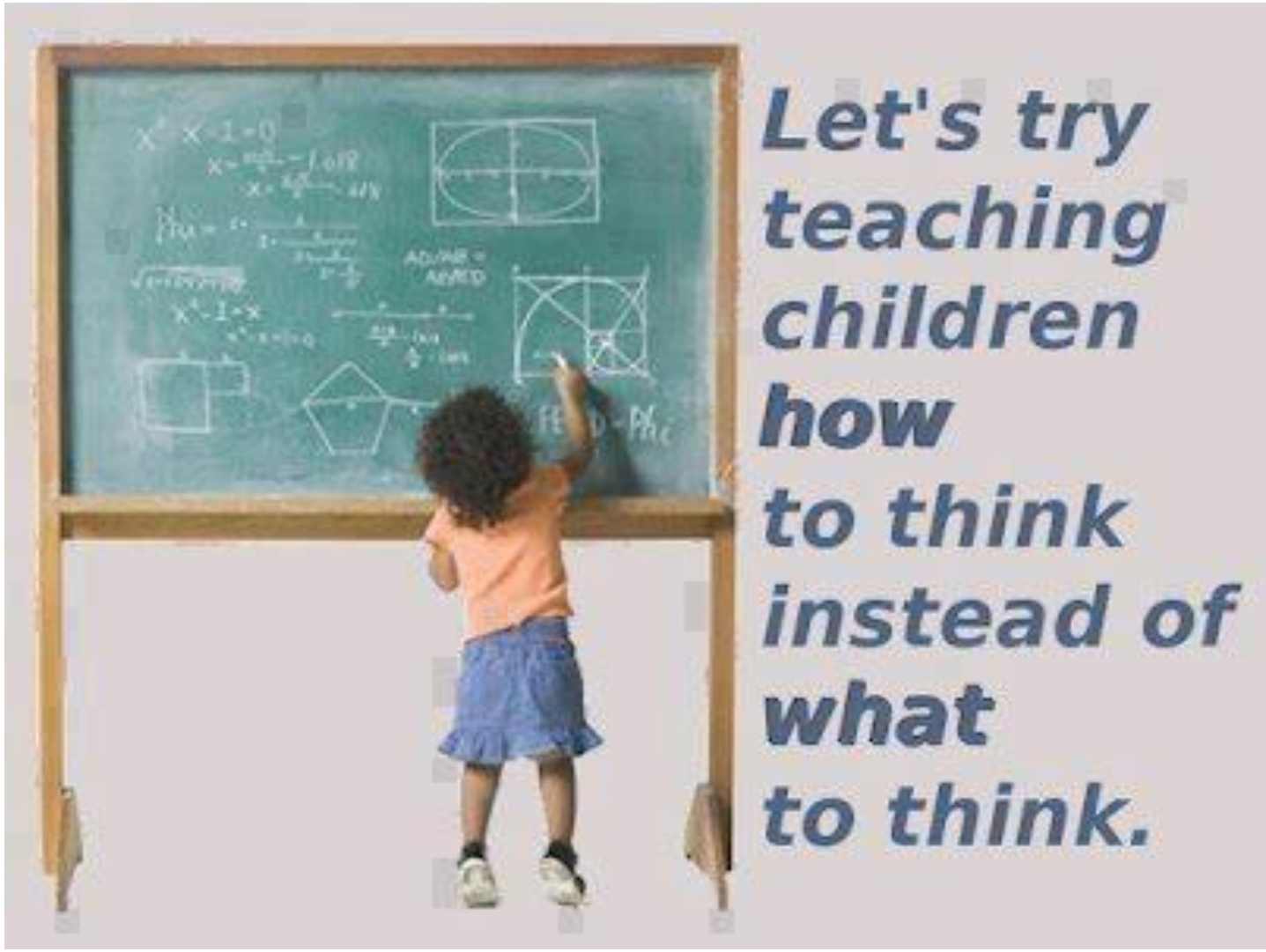
❑**Promote Ethical Standards, Transparency, and Data Privacy:**

- Formulate and enforce guidelines for ethical Artificial Intelligence (AI) usage in education, prioritizing data privacy, algorithm transparency, and responsible AI practices to protect students' rights and foster trust in AI applications.

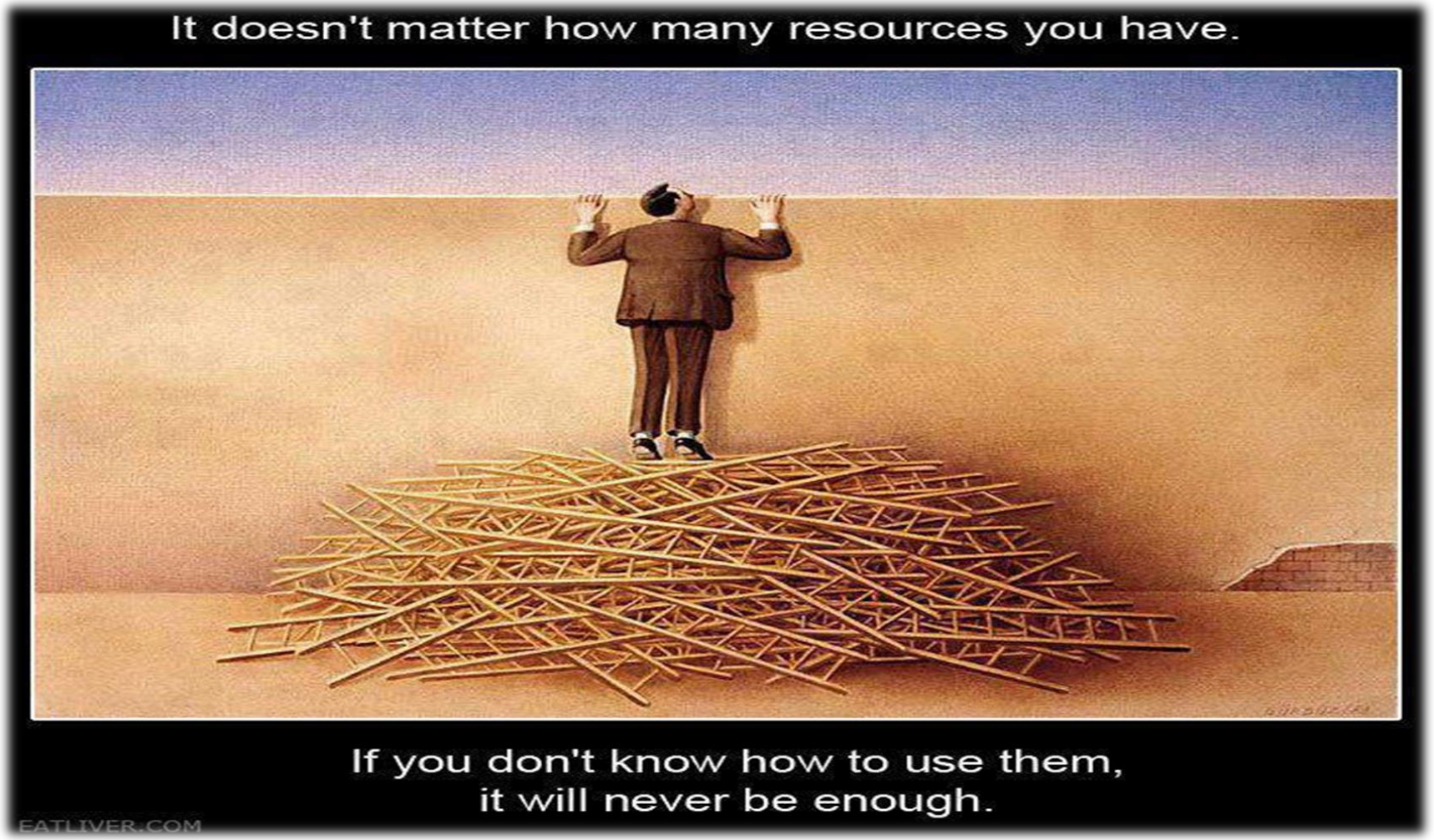
❑**Encourage Inclusive Research and Development in Artificial Intelligence (AI) for Education:**

- Support R&D initiatives that focus on accessible and adaptable AI tools tailored to diverse educational contexts, ensuring that AI advancements address a broad spectrum of learning needs and contribute to equitable educational outcomes.

Recommendation



Conclusion


It doesn't matter how many resources you have.
If you don't know how to use them,
it will never be enough.
EATLIVER.COM

Conclusion

- Artificial intelligence (AI) has the potential to transform education by personalizing learning experiences, enhancing student engagement, and improving instructional effectiveness.
- While challenges such as equity and data privacy must be addressed, the successful implementation of AI in education can lead to innovative learning environments and better outcomes for all students.
- Embracing these technologies will empower educators and learners to thrive in an increasingly digital world.

Acknowledgement

- I would like to express my heartfelt gratitude to the organizer for putting together this incredible event.
- Special thanks to the person who prepared the engaging slides, which greatly enhanced the presentation.
- I am truly grateful to the attentive listeners whose presence made this experience worthwhile.
- Lastly, I extend my appreciation to all the enthusiastic participants who actively contributed to the discussions.
- Your support and involvement have made this event a resounding success.
- Thank you all!

Thank you for listening.

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