16 JUNE 2023

ETHICS OF **ARTIFICIAL INTELLIGENCE IN EDUCATION**

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UNESCO MGIEP

Mahatma Gandhi Institute of Education for Peace and Sustainable Development

MGIEP is UNESCO's Category 1 Research Institute focused on Transforming Education towards SDG 4.7 through programmes that promote social and emotional learning, innovate digital pedagogies and empower youth.

Our vision is "Building Kinder Brains"

FOCUS OF THIS TALK

ETHICS OF "AI" IN EDUCATION

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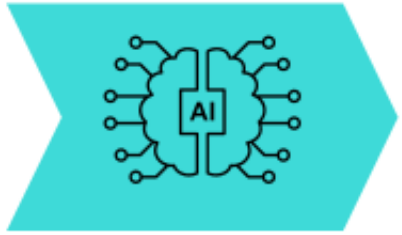
1 - Education

2 - Artificial Intelligence



3 - AI in Education

4 - Ethics

5 - Ethics of AIEd

Aspect 1

WHAT DO WE WANT ‘AI’ TO DO IN EDUCATION?

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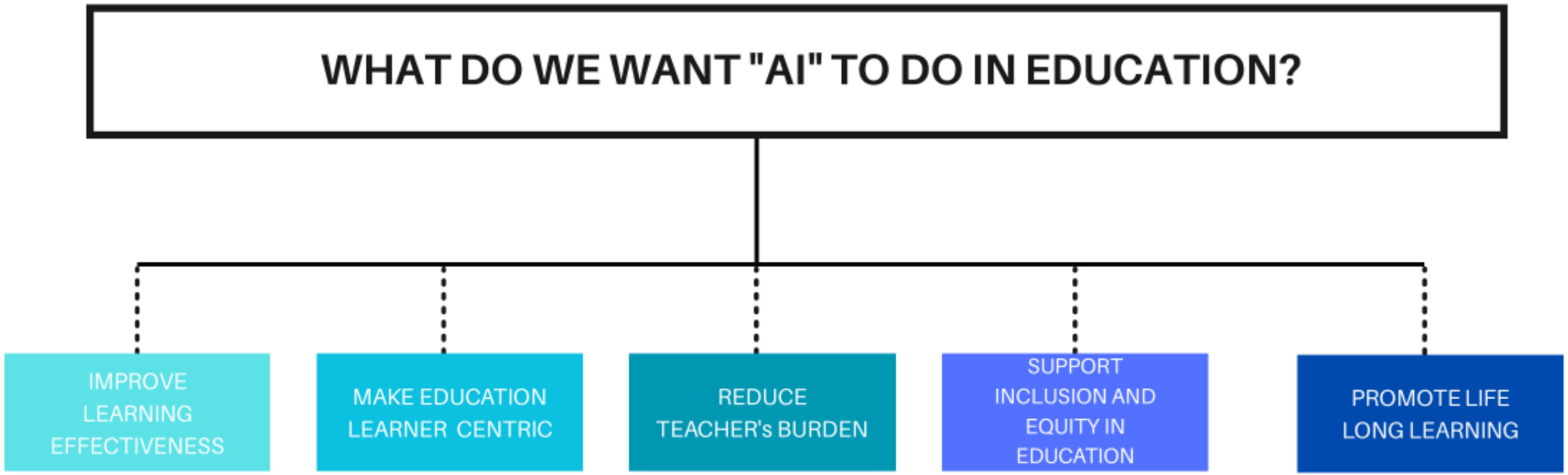
WHAT DO WE WANT "AI" TO DO IN EDUCATION?



WHAT DO WE WANT "AI" TO DO IN EDUCATION?

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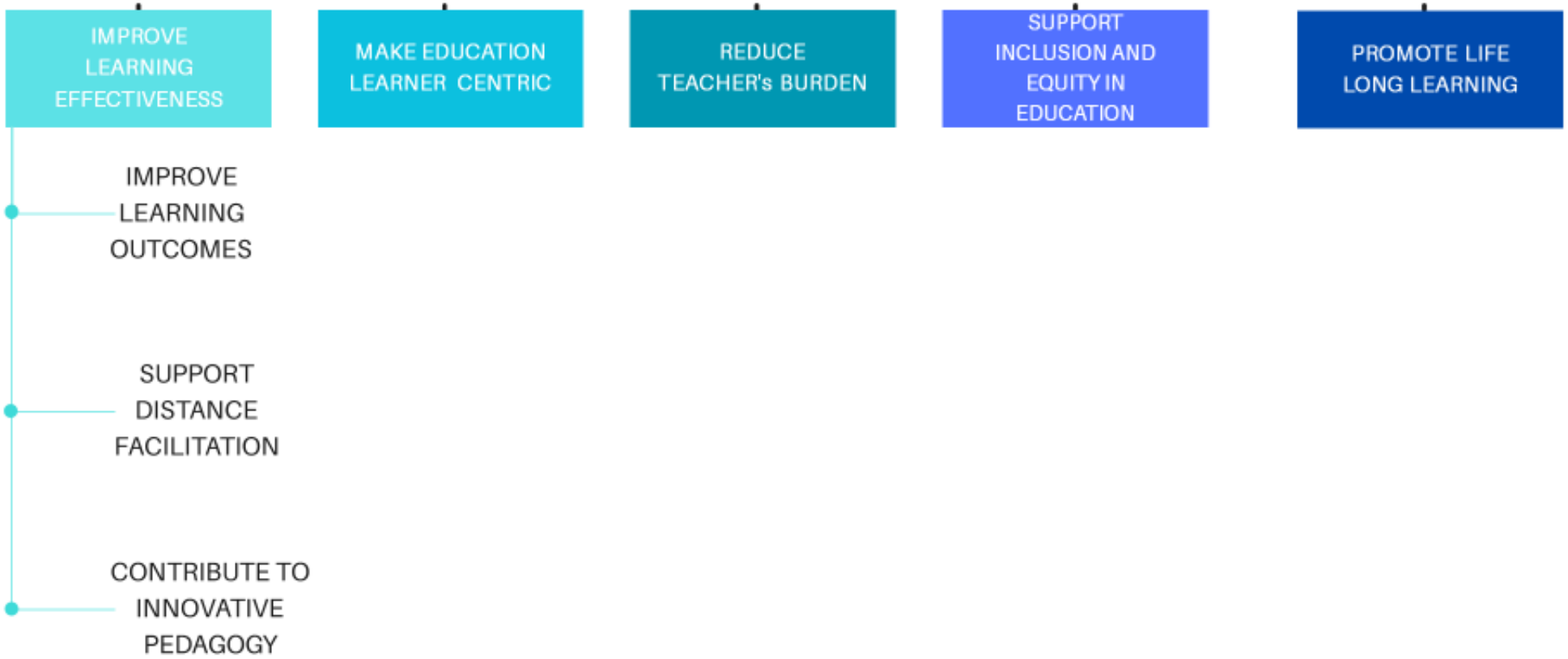

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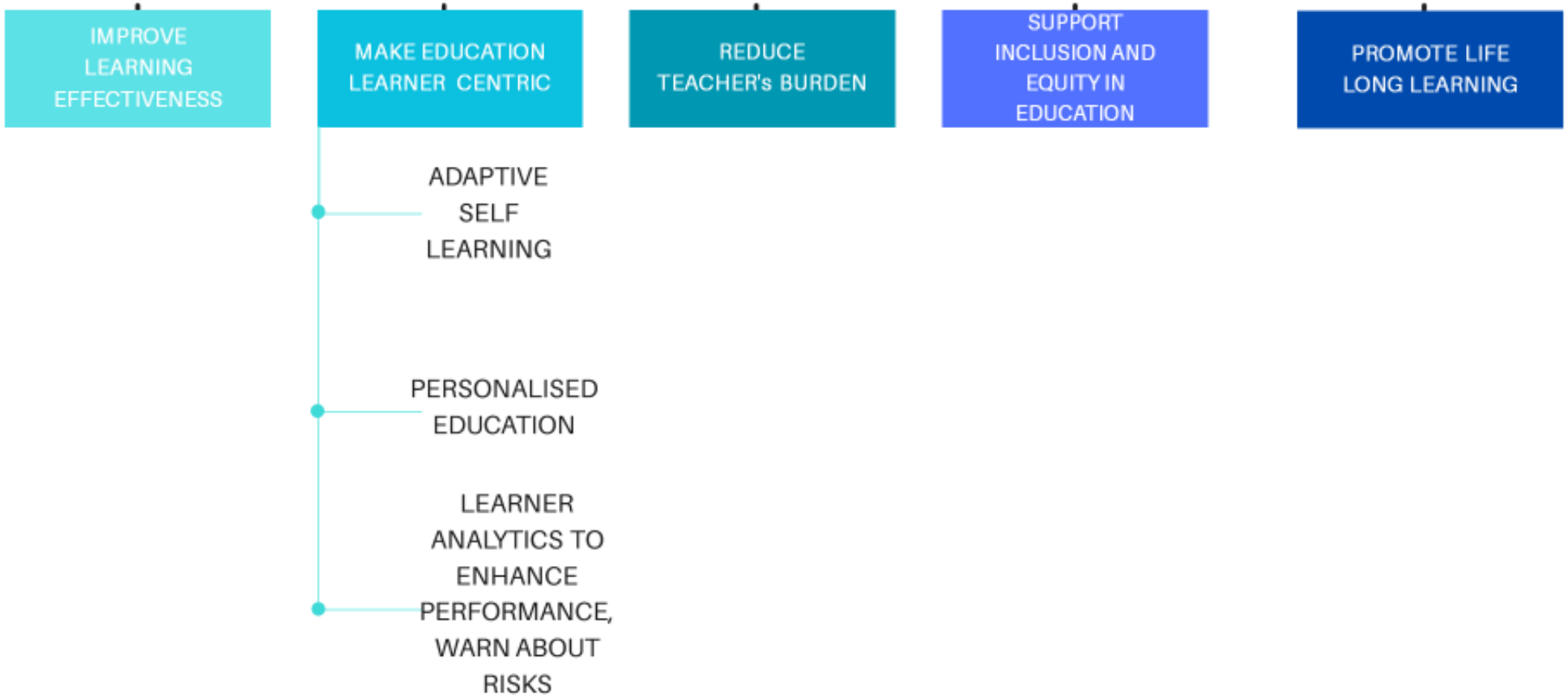

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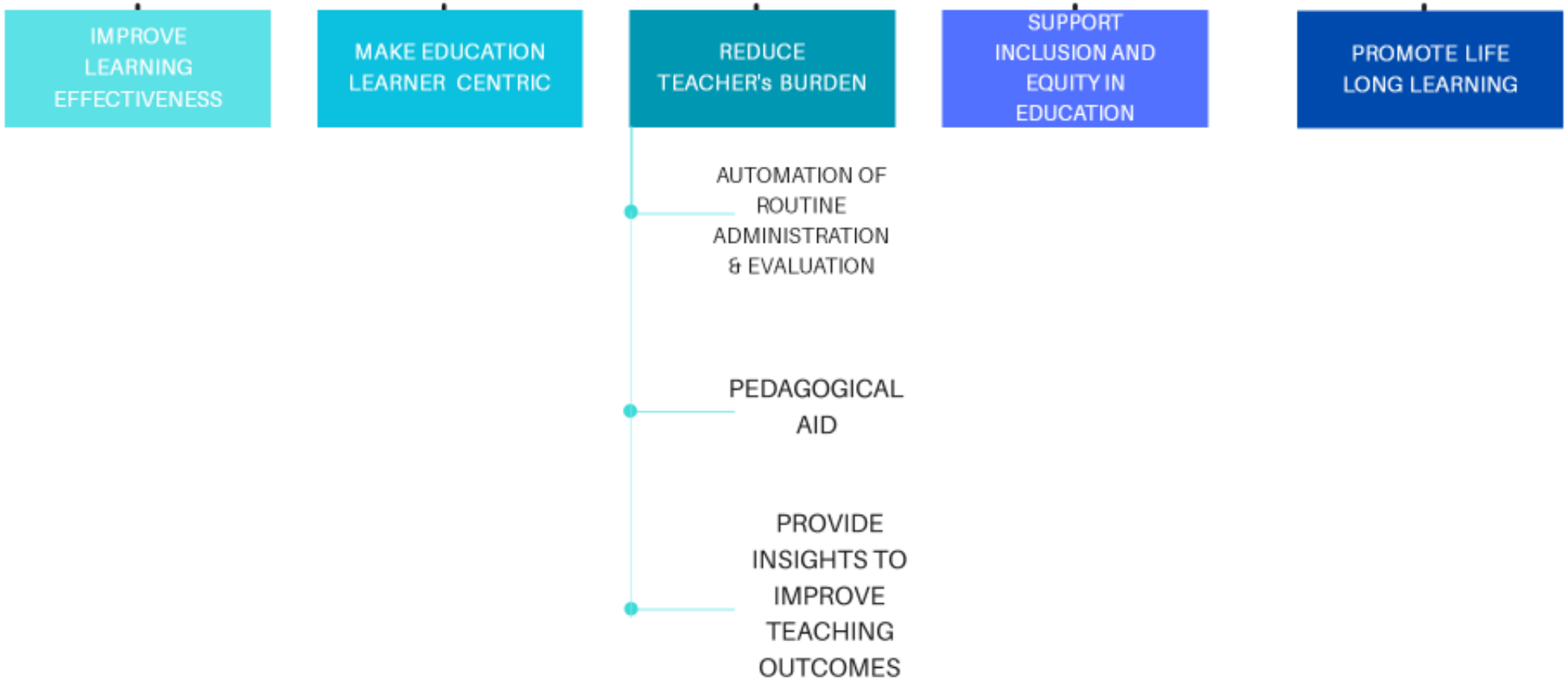

WHAT DO WE WANT "AI" TO DO IN EDUCATION?

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- IMPROVE LEARNING EFFECTIVENESS
- MAKE EDUCATION LEARNER CENTRIC
- REDUCE TEACHER's BURDEN
- SUPPORT INCLUSION AND EQUITY IN EDUCATION
  - IMPROVE ACCESS TO QUALITY EDUCATION
  - ENSURE CONTINUITY OF EDUCATION IN CRISIS
  - SUPPORT STUDENTS WITH SPECIAL NEEDS
- PROMOTE LIFE LONG LEARNING

WHAT DO WE WANT "AI" TO DO IN EDUCATION?

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WHAT DO WE WANT "AI" TO DO IN EDUCATION?

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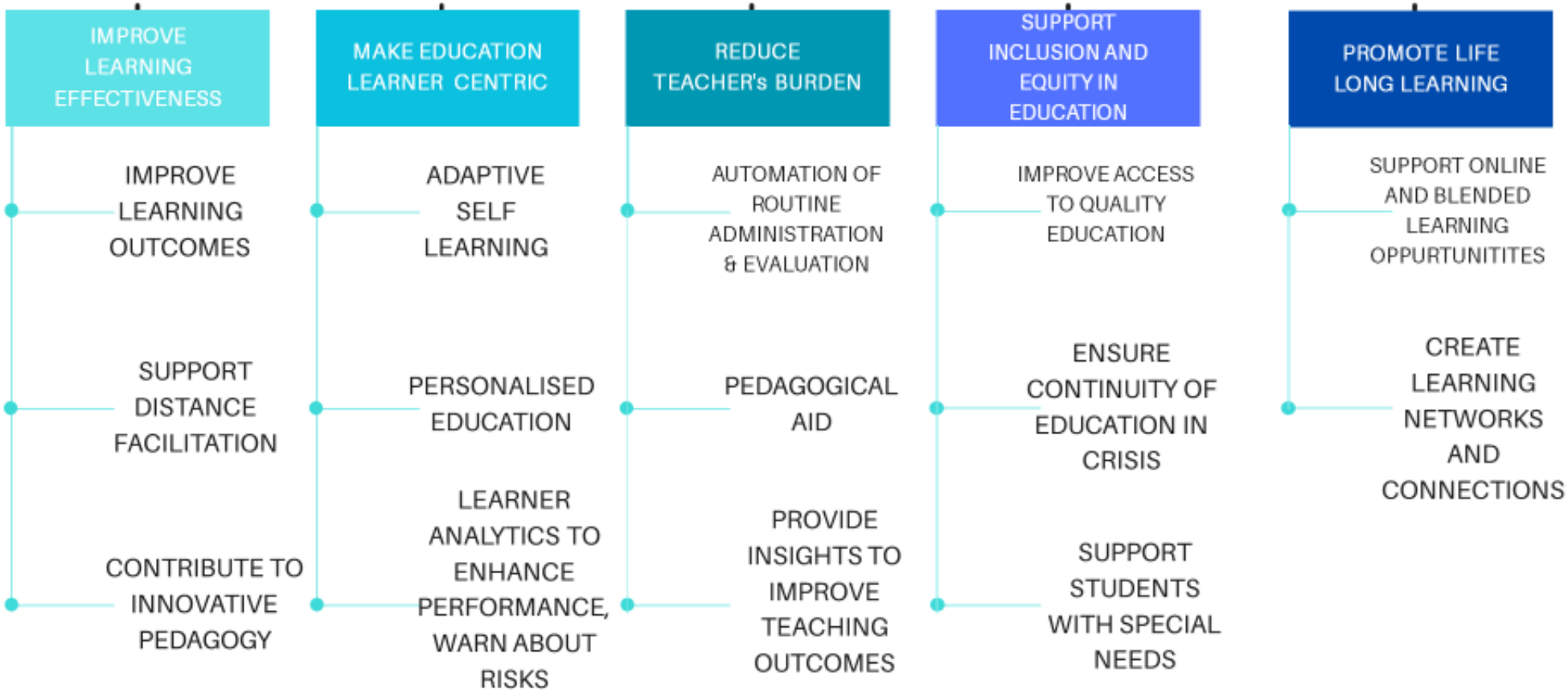

TAXONOMY OF AIED SYSTEMS

- Student Focused AIED Systems
- Teacher Focused AIED Systems
- Institution Focused AIED Systems

Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European Journal of Education*.

TAXONOMY OF AIED SYSTEMS

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- **Student Focused AIED Systems**

  - Intelligent Tutoring Systems (ITS)* * *
  - AI-assisted Apps (e.g., maths, text-to- speech, language learning)* * *
  - AI-assisted Simulations (e.g., games-based learning, VR, AR)* * *
  - AI to Support Learners with Disabilities* * *
  - Automatic Essay Writing (AEW)* * *
  - Chatbots* * */* *
  - Automatic Formative Assessment (AFA)* * */* *
  - Learning Network Orchestrators* * */* *
  - Dialogue-based Tutoring Systems (DBTS)* * *
  - Exploratory Learning Environments (ELE)* *
  - AI-assisted Lifelong Learning Assistant*

speculative (*), researched (* *), or commercially available (* * *)

Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European Journal of Education*.

TAXONOMY OF AIED SYSTEMS

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- **Teacher Focused AIED Systems**
  - Plagiarism detection* * *
  - Smart Curation of Learning Materials* * *
  - Classroom Monitoring* * *
  - Automatic Summative Assessment* * */* *
  - AI Teaching Assistant (including assessment assistant)* * */*
  - Classroom Orchestration* *

speculative (*), researched (* *), or commercially available (* * *)

Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European Journal of Education*.

TAXONOMY OF AIED SYSTEMS

- **Institution Focused AIED Systems**
  - Admissions (e.g., student selection)* * *
  - Course-planning, Scheduling, Timetabling* * *
  - School Security* * *
  - Identifying Dropouts and Students at risk* * *
  - e-Proctoring* * *

speculative (*), researched (* *), or commercially available (* * *)

Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European Journal of Education*.

Aspect 2

WHAT DO WE *NOT* WANT ‘AI’ TO DO IN EDUCATION?

ETHICS OF ‘AI’ IN EDUCATION

‘AI’ IN EDUCATION

ETHICAL ISSUES

1. Data Issues
2. Fairness of access
3. Fairness of the training dataset
4. Al Summative Judgements
5. Potential Monopoly on Education

Mark S Steed, 2020

ETHICAL ISSUES OF AIED

DATA ISSUES

Reflection Question

How would you react if your child's private educational data, including their personal information and academic performance, were ruthlessly exploited by cybercriminals?

Mark S Steed, 2020

ETHICAL ISSUES OF AIED

DATA ISSUES

- Security
- Data Ownership
- Privacy

Mark S Steed, 2020

ETHICAL ISSUES OF AIED

FAIRNESS OF ACCESS

Reflection Question

How would you feel if your child's access to quality education is determined solely by availability of some AI system?

Mark S Steed, 2020

ETHICAL ISSUES OF AIED

FAIRNESS OF ACCESS

- Digital divide
  - Widening the gap between privileged and underprivileged
- Global North vs. Global South
- Who would get access to what AIED services
  - Different price points (premium education, mid-range education, budget education)

ETHICAL ISSUES OF AIED

FAIRNESS OF TRAINING DATASET

Reflection Question

Can you trust an AI system if they got their intelligence from biased data?

Mark S Steed, 2020

ETHICAL ISSUES OF AIED

FAIRNESS OF TRAINING DATASET

- Imbalanced representation
- Underrepresented perspectives
- Unfair algorithmic decisions
- Discriminatory outcomes
- Reinforcing inequalities

Mark S Steed, 2020

ETHICAL ISSUES OF AIED

"AI" SUMMATIVE JUDGEMENTS

Reflection Question

Can you accept a future for your children where their career possibilities are dictated by an enigmatic AI, leaving you in the dark?"

Mark S Steed, 2020

ETHICAL ISSUES OF AIED

"AI" SUMMATIVE JUDGEMENTS

- What if AI "black box" judgements
  - replace exams?
  - determine who goes to university?
  - determine who gets the job?

Mark S Steed, 2020

ETHICAL ISSUES OF AIED

MONOPOLY OF EDUCATION

Reflection Question

Can you envision a future where educational opportunities are dictated by a few dominant AI companies in education sector?

Mark S Steed, 2020

ETHICAL ISSUES OF AIED

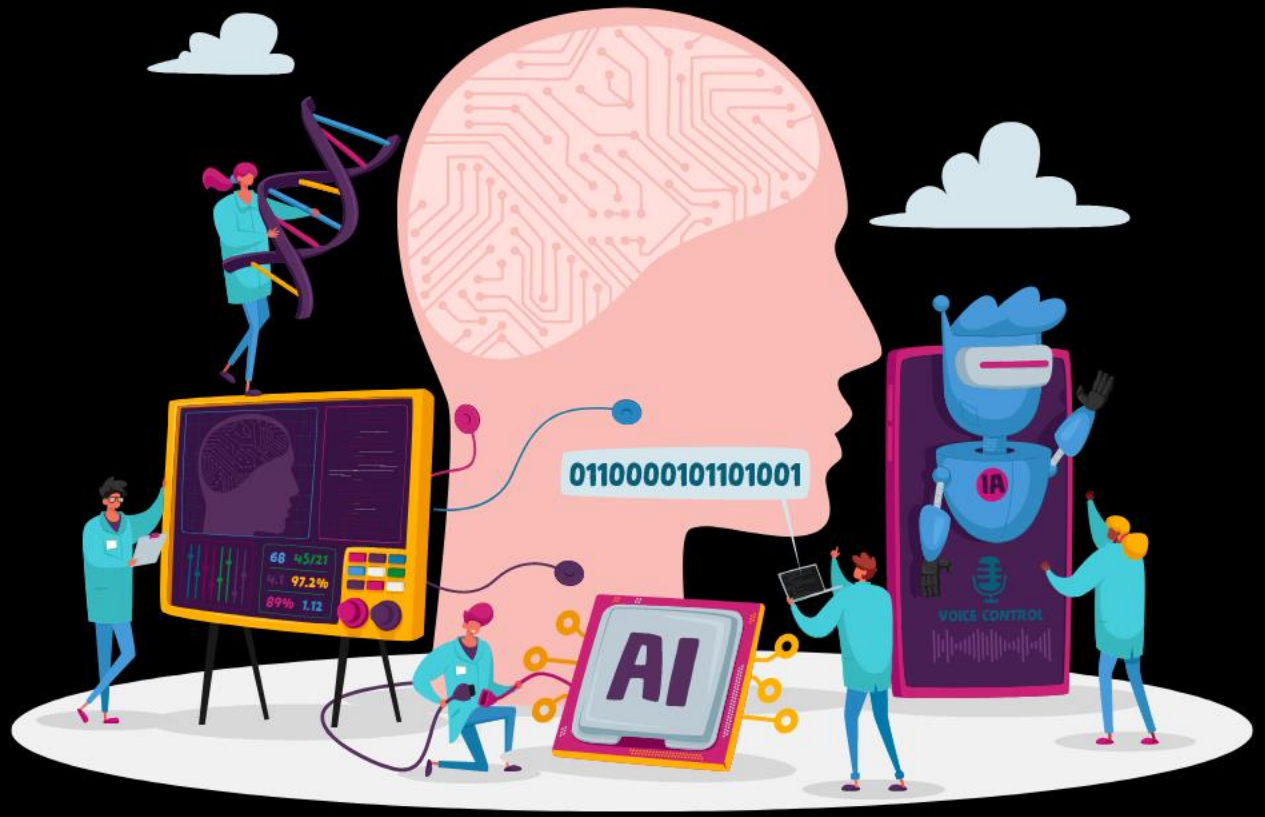
MONOPOLY OF EDUCATION

There is potential for there to be an ***"Amazon of Education"*** which:

- Controls what is taught
- Controls what is allowed be taught
- Promoting certain ideologies or lifestyles

Mark S Steed, 2020

WHAT ARE THE SOLUTIONS?



TRADE OFFS

REAL CHALLENGES

- **Privacy VS Effectiveness**
  - Machine learning offers better outcomes and increases accuracy. However, for privacy and security, these may therefore need to be balanced with stronger consent rules.
  - In other situations, one may need to let go of privacy in remedial delivery for increasing one's utility or productivity.

- **Explainability VS Accuracy**
  - Although deep learning systems may make more accurate predictions, they may conflict with the Explainability of the decisions/outcomes.

- **Innovation VS Precision**
  - Use of sandbox pilot tests to properly understand systems which might prolong the time it takes for an AI education system to be used on-ground.

- **Efficiency VS non-discrimination**
  - AI system might need to let go of certain variables like race, gender, caste and such, particularly if the training dataset was not representative.

TO ARRIVE AT PERMISSIBLE TRADE-OFFS

THREE STAGE ANALYSIS

Ethical risk assessment

What are the likely ethical risks

How probable they are of occuring

Risk evaluation

Who are most likely to face theses risks

What would be effects/implications of the risks on them

Risk management

Cost benefit analysis to arrive at acceptability levels of risks

Exploring solutions to mitigate risks to the extent possible

TECH ETHICS BY DESIGN

SYSTEMIC EMPATHY

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Layers of Effects

- Primary - intended effects
- Secondary - intended effects
- Unintended effects

Dichotomy Mapping

Benefits	Harms
.....	.....

Ethical Hacking

- Principles/ Rights
- Design Modifications
- Strategy Modifications

Source: Culture, Trust, and AI IBM Technology, Youtube

PRACTICES AND PRINCIPLES AT UNESCO MGIEP

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- GDPR (General Data Protection Regulation)
- Data Organization
  - Anonymized data collection and storage
  - Revocable data organization
    (Organize data in such a manner that revoking is easy)
- Augmentations of the phases of *Education Design Research (DBR, DBIR, DDR)* with Ethical Auditing process
- Systemic Empathy

USEFUL RESOURCES

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1. Jain, A. (2017). Weapons of math destruction: how big data increases inequality and threatens democracy.
2. Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. European Journal of Education.
3. Siau, K., & Wang, W. (2020). Artificial intelligence (AI) ethics: ethics of AI and ethical AI. Journal of Database Management (JDM), 31(2), 74-87.
4. Ryan, M., & Stahl, B. C. (2020). Artificial intelligence ethics guidelines for developers and users: clarifying their content and normative implications. Journal of Information, Communication and Ethics in Society.
5. Talk - The Ethics of AI in Education, IndependentHead @ Youtube
6. Lecture on Culture, Trust, and AI, by IBM Technology@ Youtube

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Google for Education

3 trends driving the future of education

Bani Paintal Dhawan

Head of Education, South Asia,
Google India

Date: June 16, 2023

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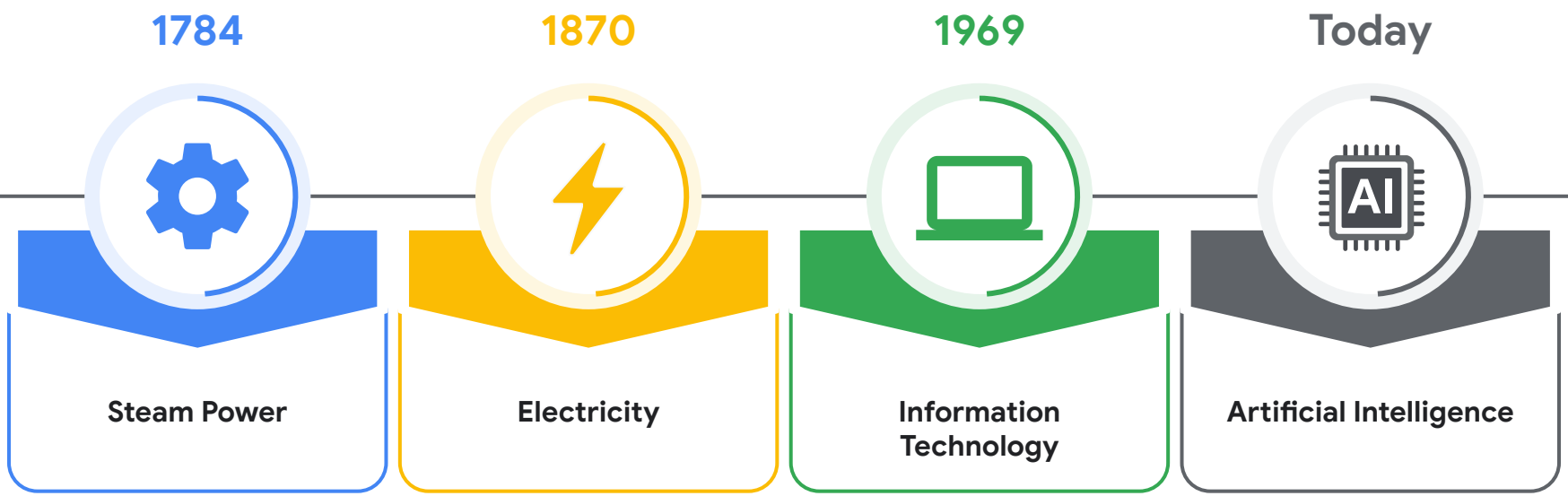
We're in an AI driven revolution



Source: AI: Recent Trends and Applications, Emerging Communication and Computing

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We realize we are going to be bold and responsible...We haven't hooked up Bard to our most capable models yet, and we plan to do it deliberately. And so through this moment, I think we are going to stay balanced, but we are going to innovate."

Sundar Pichai

March 2023, Hard Fork - NY Times Podcast

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3 trends driving the future of education

Making learning personal

Elevating the teacher

Empowering educators with data

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Making learning personal

acer

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Giving students the tools they need

Harnessing AI to make learning **personal**

Helping to make learning **more accessible**

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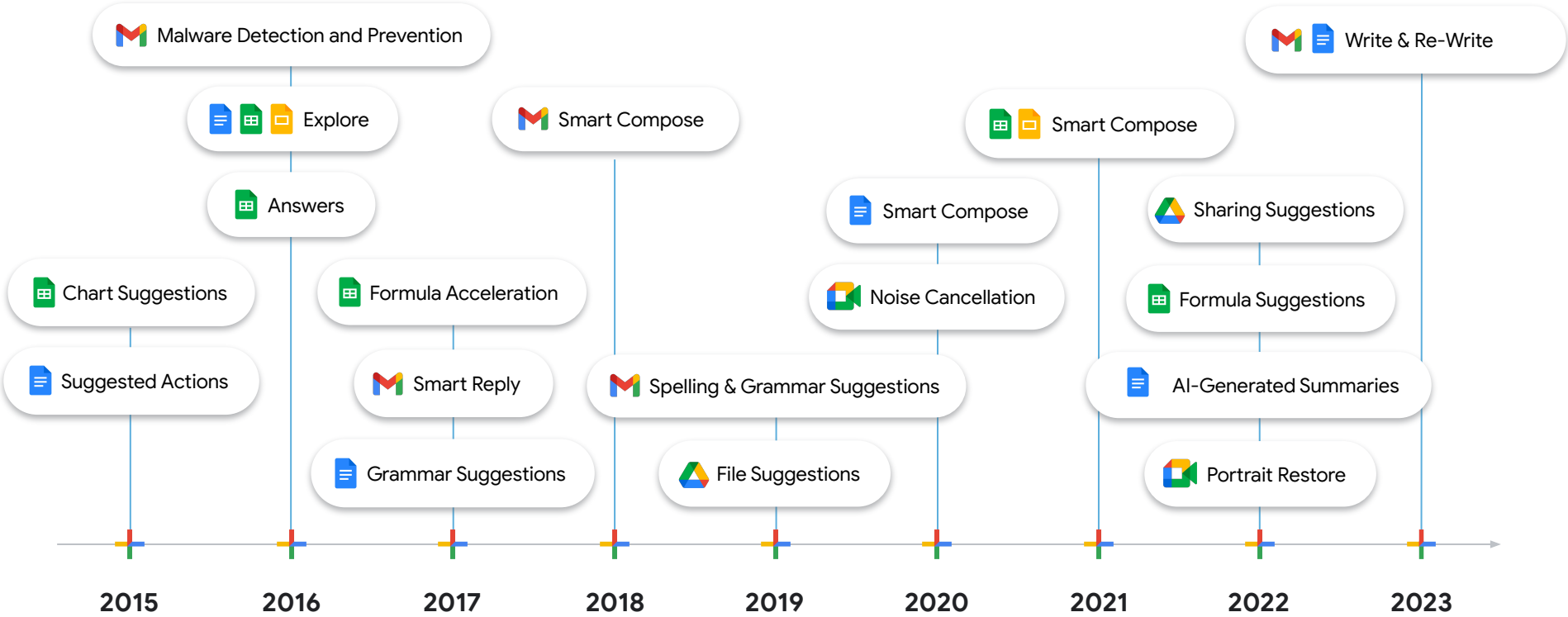
We've put AI to Work for 3 Billion Users in Google Workspace



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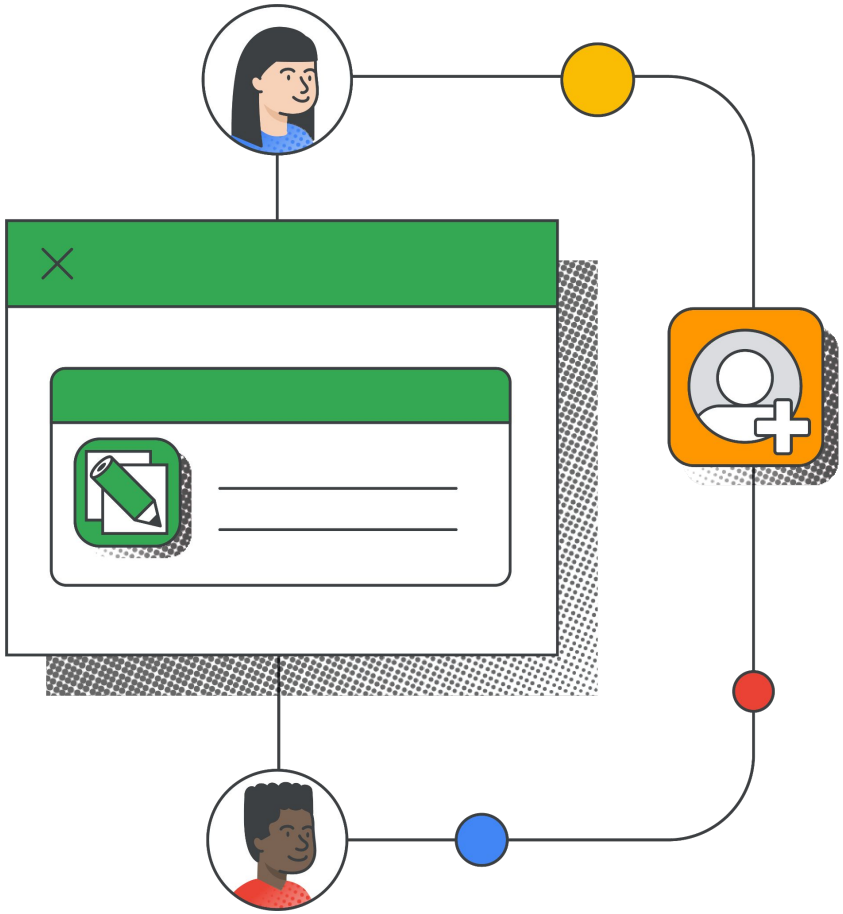
Practice Sets

Google Classroom

Time-saving, interactive lessons with practice sets

Transform any teaching content into engaging, student-centered, interactive assignments that give educators better insights and inspire students as they work.



Google for Education

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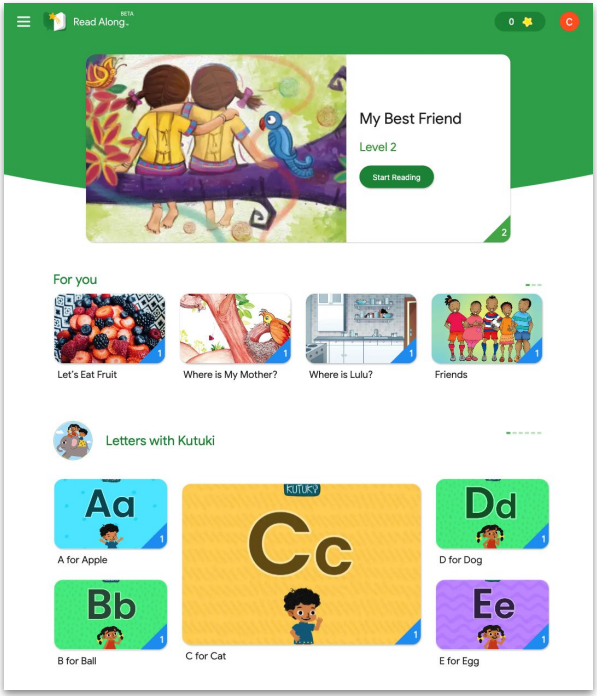
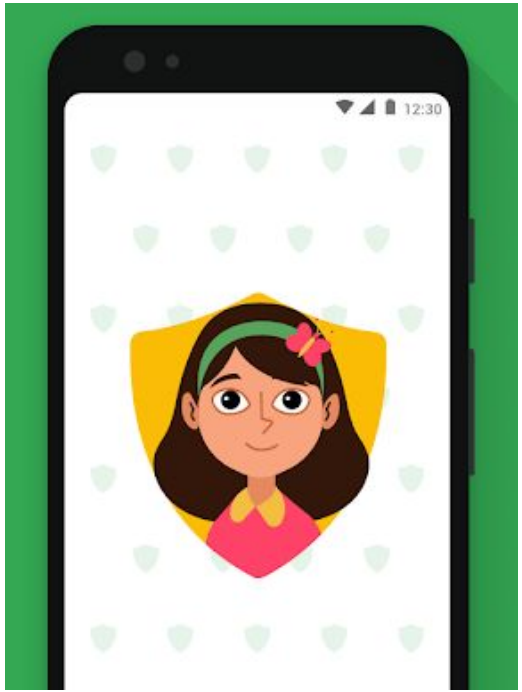
Read Along: Learn to read with the magic of your voice!

A fun speech-based app to help students' independently learn and build their reading skills with the help of an in-app reading buddy





Read Along™

Learn to read with the magic of your voice.

readalong.google.com

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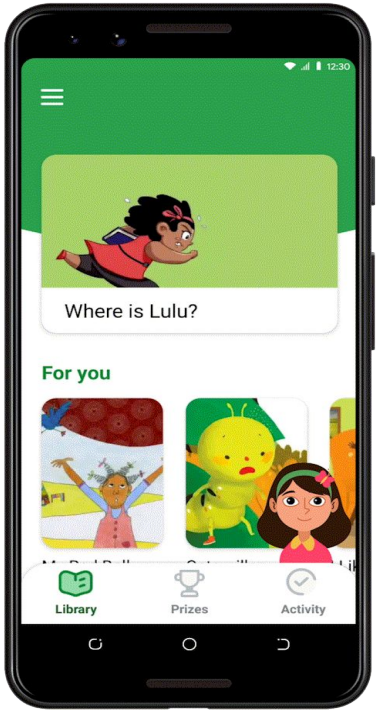
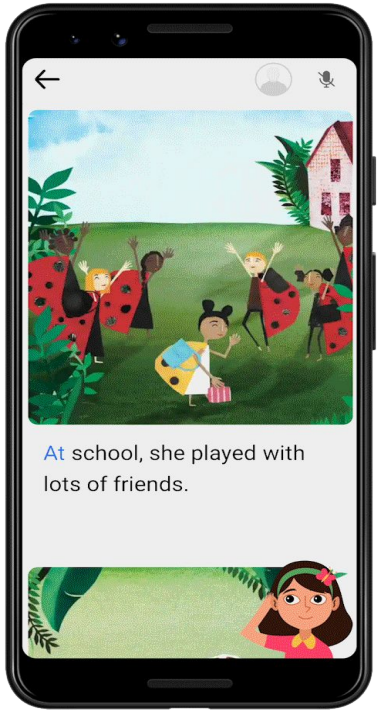
With 1000+ stories in 11 languages, Read Along is available to users on Android and Web





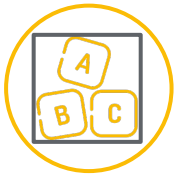
Works offline, Safe and Secure and Free of charge

Impact of Read Along so far:

23Mn+
Downloads

34Mn+
Children Reached

172Mn+
stories read completely



29Bn+
words read correctly in-app

Source: Read Along internal data, Updated by: June 2023

Support students where they are, so they can get where they want to go, faster.

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Elevating the teacher

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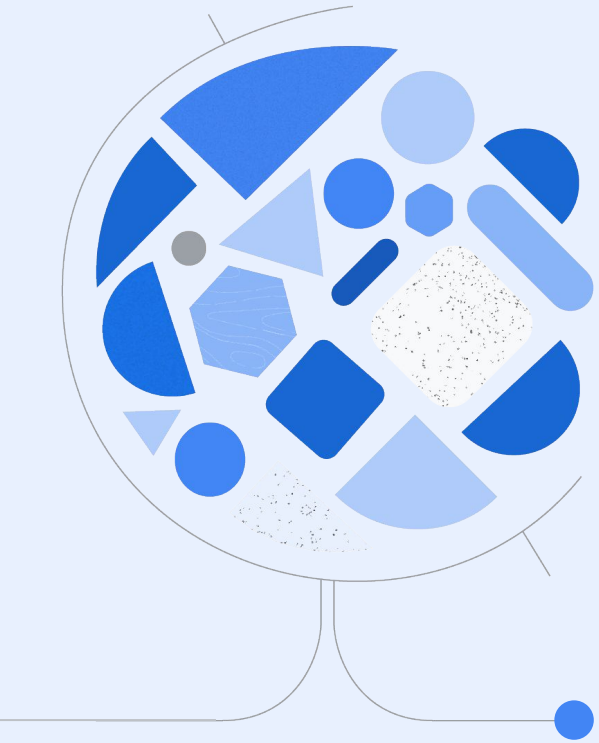

Gone are the days when teachers stood in front of a classroom and just told students what to do or taught them from a traditional textbook. Students are a lot more engaged through digital platforms that allow them to be more autonomous and creative in their learning.”

Keishia Thorpe

Global Teacher Prize Winner, 2021, English success coach, United States

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AI in education: what excites educators?

New possibilities for teaching

Ability to save teachers time

Enormous positive potential

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Generative AI has the potential to Power new ways of working

When we apply technology meaningfully, we unlock new possibilities for learning

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Empowering educators with data

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Three ways to empower educators with data

Provide real-time insight into student progress

Create inclusive learning opportunities

Visibility into effective instruction

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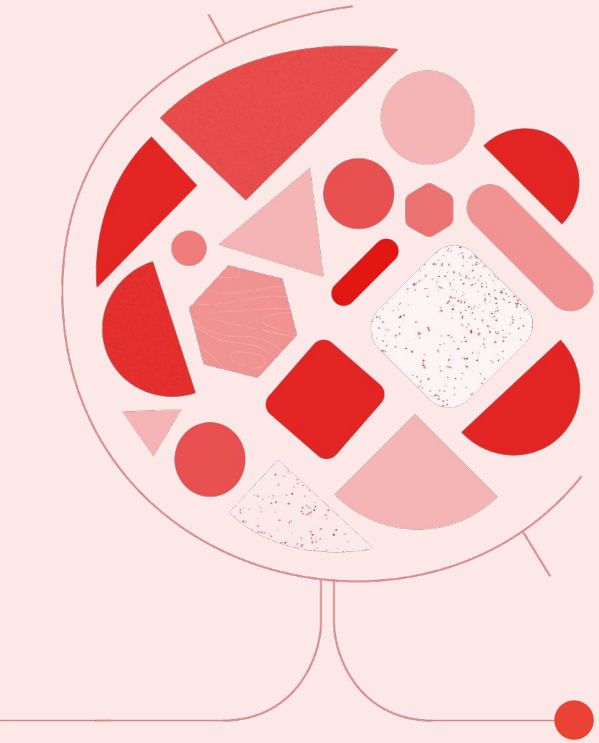


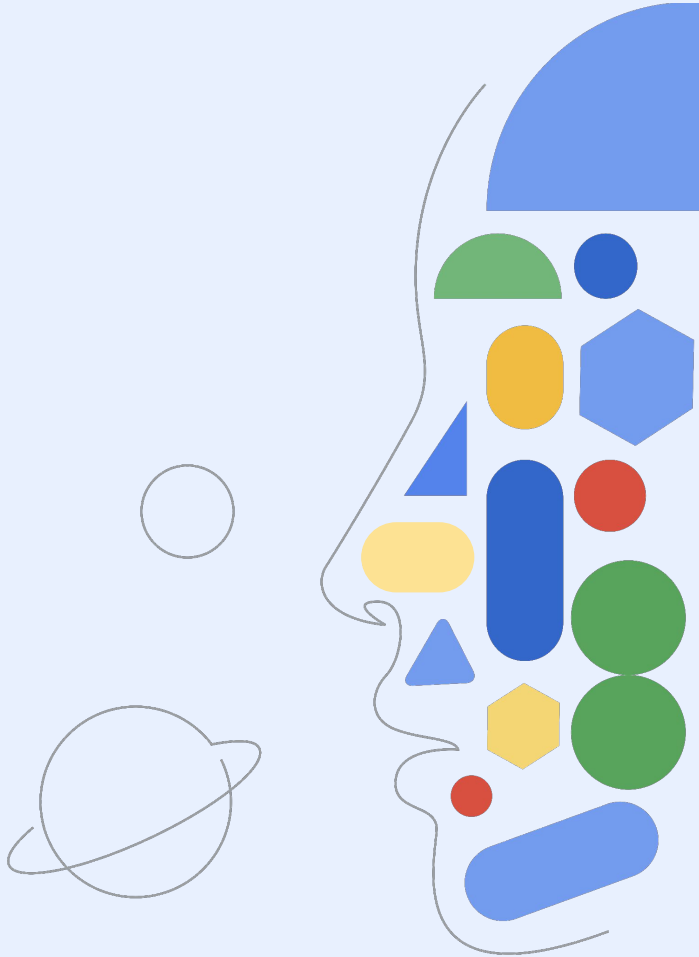
Data is the soil
Insights are the seeds
AI is the gardener

Bard generative AI response to the prompt “ *Draft me a metaphor that explains the relationship between data, insights and artificial intelligence and the impact to education*”

When educators receive useful data, they are able to give their students a clear direction.

edu.google.com/future-of-education

Google for Education

Google for Education

Thank you.