https://doi.org/10.5281/zenodo.xxx

UNIVERSITÄT BONN

ETHISCHE KI UND HOCHSCHULLEHRE

Dr. Christian M. Stracke

Rheinische Friedrich-Wilhelms-Universität Bonn, Germany

Vortrag an der Universität Bremen
24. Januar 2024, online

stracke@uni-bonn.de http://www.opening-up.education

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Bevor wir starten …

Was ist Ihre Position?

https://www.menti.com

Code: 4671 4657

Ethische KI-Nutzung ist für mich ...

-5 (sehr unwichtig) **+5 (sehr wichtig)**

Was ist Ihre Position?

https://www.menti.com

Code: 4671 4657

KI wird die (Hochschul-) Bildung ...

-5 (stark verschlechtern) **+5 (stark verbessern)**

Was ist Ihre Position?

https://www.menti.com

Code: 4671 4657

Mit ethischer KI-Nutzung kenne ich mich aus ...

1 (gar nicht) **10 (sehr gut)**

Die heutige Agenda

Ethische und Soziale Aspekte der KI-Nutzung in der Hochschullehre

Vortrag mit Rückfragen

Diskussion im Plenum dazu

Plenum zur Frage: Wie fange ich an?

Kurzvorstellung von Literatur und Tools

Ethische und Soziale Aspekte der KI-Nutzung in der Hochschullehre

Was sind Ihre Interessen?

Ethische und Soziale Aspekte der KI-Nutzung in der Hochschullehre

Vortrag

https://doi.org/10.5281/zenodo.xxx

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About myself

Coordinator Cloud Strategy, OE and AI&ED, University of Bonn

Adjunct Professor, Korean National Open University

Advisory Professor, East China Normal University

Founder & Director, European Research Institute eLC

100+ research projects with 55+ Mio. € budgets

200+ scientific publications incl. 100+ peer-reviewed / SSCI

Creative design & training for 15,000 teachers & 5,000 schools

Elected Chair of ISO & CEN Standardization Committees

The early days

2001: The Computer is not a Nuremberg Funnel [German]

In: *media and education, 2001*(3), 157-160. https://doi.org/10.5281/zenodo.7427217

2004: German E-Learning Association D-ELAN e.V.

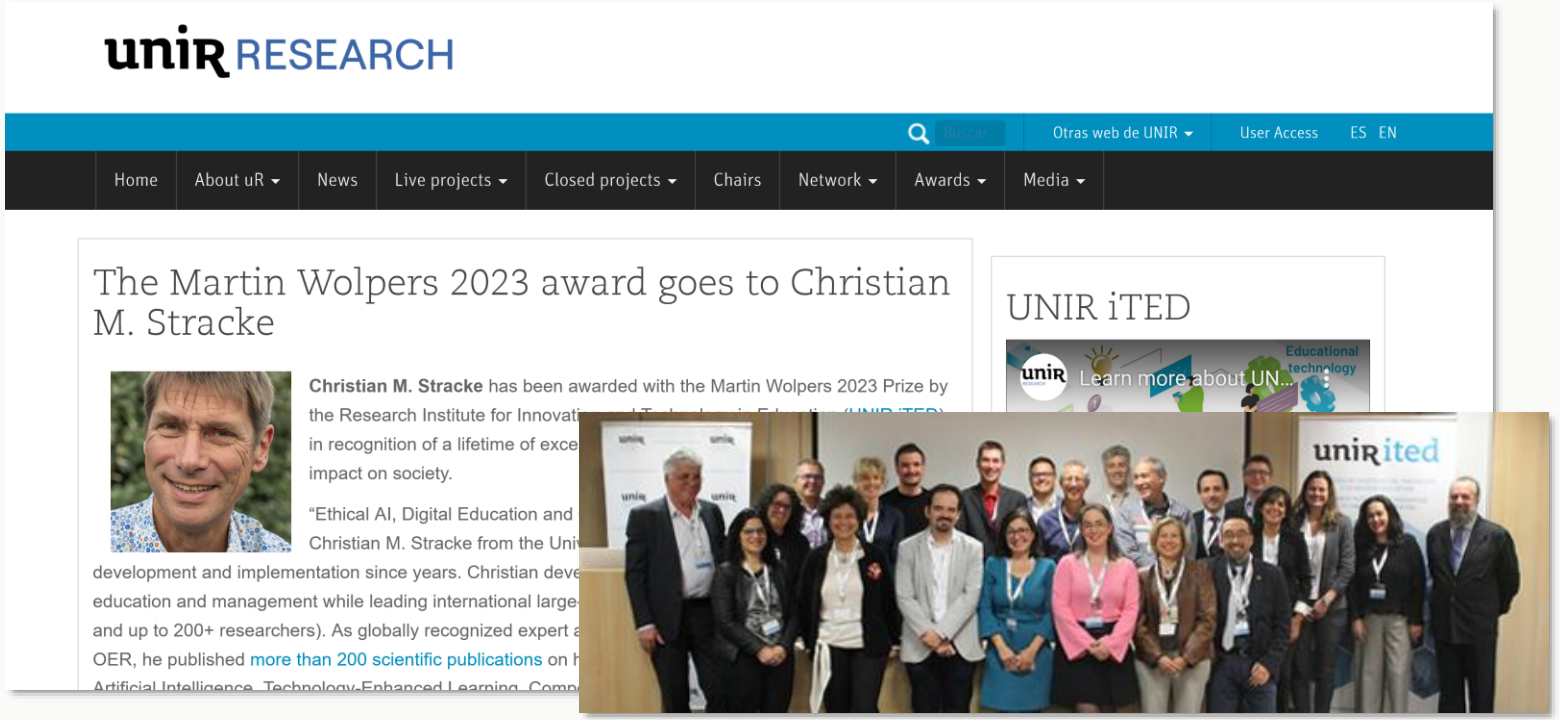
Quality for digital education:

2004: German Lighthouse project Q.E.D.

2005: ISO/IEC 19796-1 (now: ISO/IEC 40180)

2006: E-Learning Quality in Bogota

Martin Wolpers' Lifetime Award



Lifetime Award to excellence in research, education and significant impact in the society: "your large expertise in multi-authored, successful research projects and activities, full of multi-culturalism, with a realistic view, which gives the community useful outcomes with great impact for an immediate application"

http://research.unir.net/blog/martin-wolpers-2023-award-christian-m-stracke

The Big Picture

Internationale Krisen

Crisis? What Crisis?

https://en.wikipedia.org/wiki/File:Supertramp_-_Crisis.jpg

Wirtschaftskrise (Hayes, profit-only)
Bildungskrise (Innovationen, Qualität)
Medienkrise (Literacy, fake news)
Gesellschaftskrise (Ethik, Egoismus)

Wir brauchen innovative und hochwertige Open Education for all als Menschenrecht

Digitalisierung

Städtischer Handelshafen, Breslau vor 1910

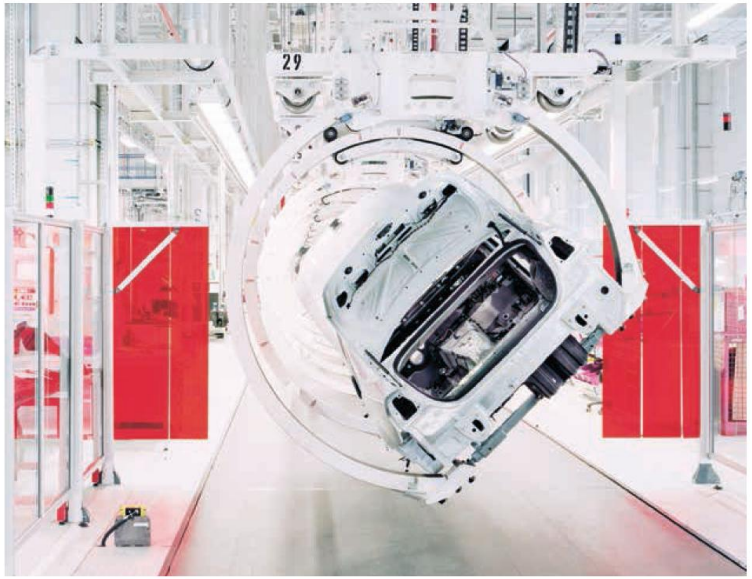
(Unbekannter Fotograf, SLUB/ Deutsche Fotothek)

Containerterminals, Hamburg (Henrik Spohler)

Photo: https://www.bmas.de/DE/Service/Publikationen/a877-01-werkheft.html

Digitalisierung

Industrie-Transport
Sachsenring, 1964
(Peter, Richard jun., SLUB/ Deutsche Fotothek)



Assembly line
(Henrik Spohler)

Photo: https://www.bmas.de/DE/Service/Publikationen/a877-01-werkheft.html

Digitalisierung

Salaternte der Arbeiterinnen und Arbeiter der Landwirtschaftlichen Produktionsgenossenschaft Marzahn, Berlin 1984

(Winkler, ddrbildarchiv.de)

Anbau junger Salatpflanzen in Süddeutschland

(Henrik Spohler)

Photo: https://www.bmas.de/DE/Service/Publikationen/a877-01-werkheft.html

Digitalisierung

Paketumschlag zu Weihnachten 1950er-Jahre, Herne

(Erich Höhne & Erich Pohl, SLUB/Deutsche Fotothek)

Paketlogistik, Verteilzentrum am Flughafen Köln/Bonn

(Henrik Spohler)

Photo: https://www.bmas.de/DE/Service/Publikationen/a877-01-werkheft.html

Digitalisierung

Bibliothekar vor Bücherregalen im Magazinbereich der Deutschen Bücherei, Leipzig 1955

(Renate und Roger Rössling,

0/1 Dataflow #1
(Henrik Spohler)

Photo: https://www.bmas.de/DE/Service/Publikationen/a877-01-werkheft.html

Digitalisierung in der Bildung?

Photos: https://www.pixabay.com (345950) - https://www.pexels.com (207691)

Spezialfall der Bildung

Bildung als Menschenrecht

SDG 4: "Quality education for all"

Gleichberechtigung, Inklusion und Schulpflicht

Lernen kann nicht erzwungen werden

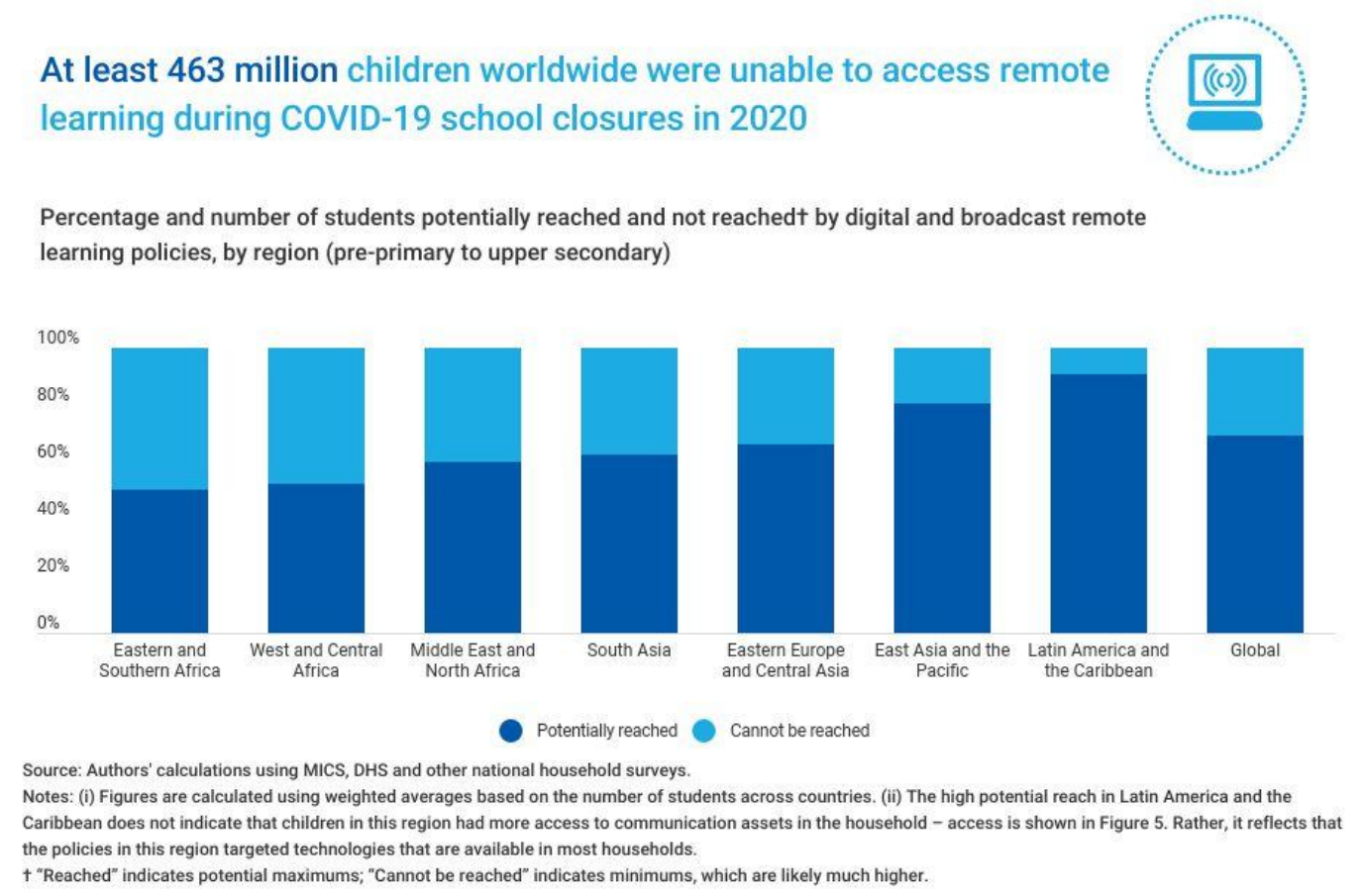
https://opening-up.education/publications

Photos: https://www.pixabay.com (345950) - https://www.pexels.com (207691)

www.sustainabledevelopmentgoals.org

www.sustainabledevelopmentgoals.org

Globale Bildung (2020)



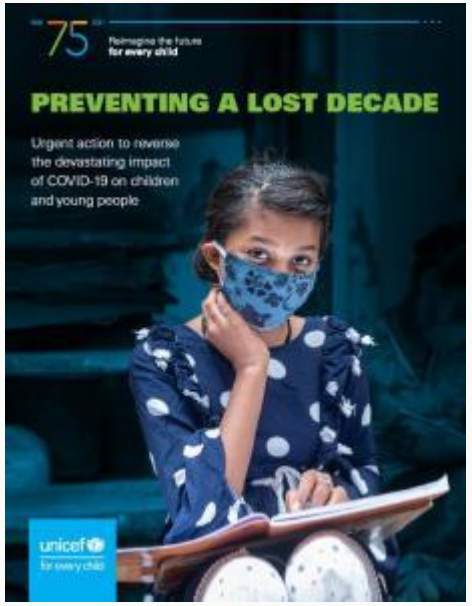
https://data.unicef.org/covid-19-and-children

463 Million Schüler*innen konnten in den COVID-19-Lockdowns nicht mehr lernen

=

1 Drittel aller!

Aktuelle Herausforderungen



New Normal?

https://www.unicef.org/reports/unicef-75-preventing-a-lost-decade

COVID-19 Pandemie & Lockdowns

Krieg in Ukraine & vielen Ländern

Klimawandel, Armut, Hunger

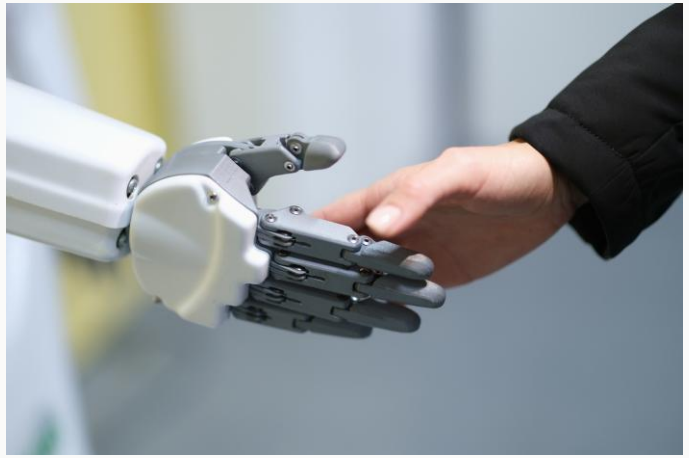
Und jetzt tritt Künstliche Intelligenz auf und verändert Denkweisen überall

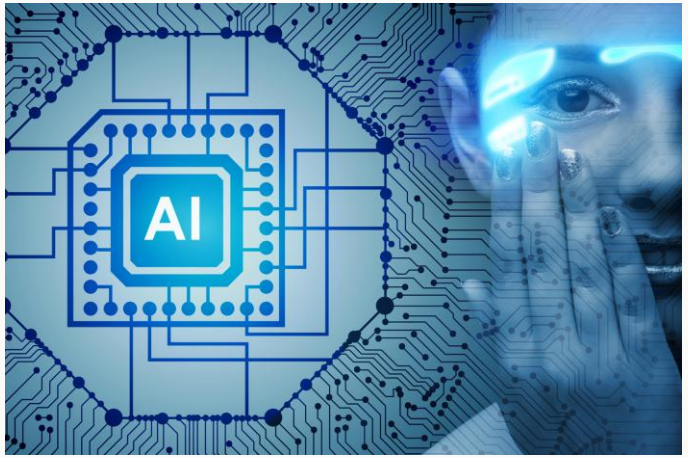
Hypothese 1

Künstliche Intelligenz verändert noch mehr als COVID-19 und alle digitalen Tools

Künstliche Intelligenz (KI)

Geschichte der KI





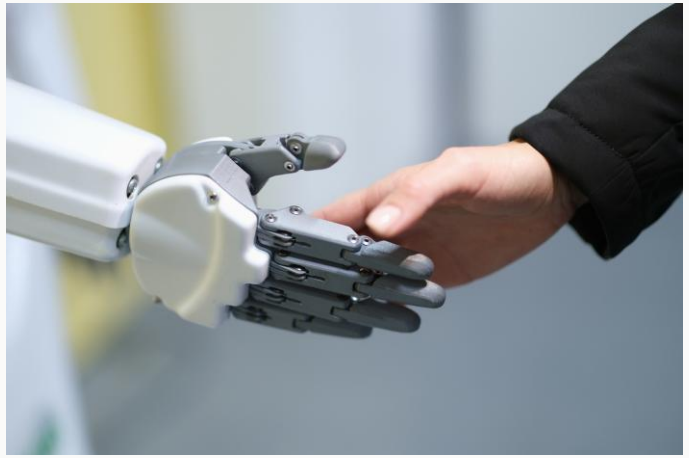
KI-Konzept von McCarthy und Forschung seit 1950s
schwache KI vs. starke KI vs. Superintelligenz
Knowledge-based AI vs. Data-driven AI
Hybride Systeme & Trainings (GenAI / GPAI)

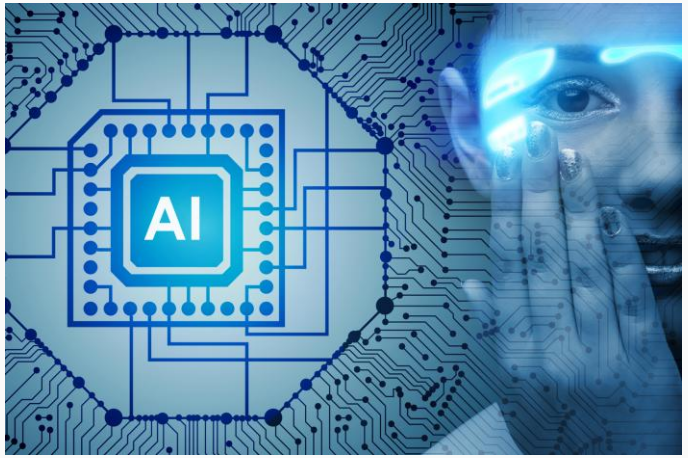
Stracke, C. M. et al. (2024). https://doi.org/10.1007/978-3-031-64315-6_21 (pre-print: https://doi.org/10.5281/zenodo.11518072)

Was ist KI?

https://butschkow.de/

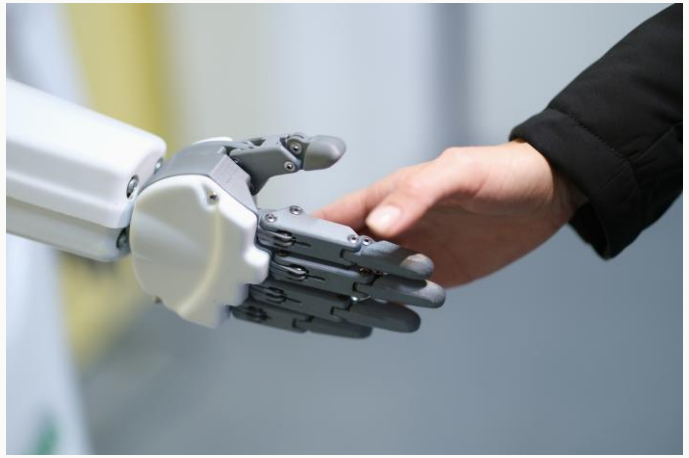
Was ist KI?

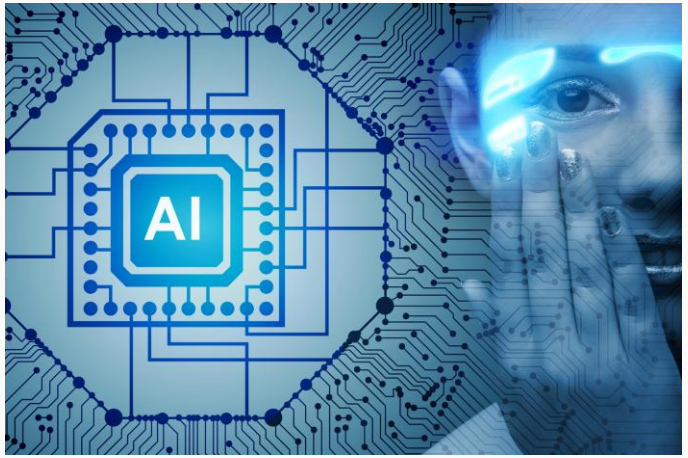




Wie definieren Sie KI?

Was ist KI?

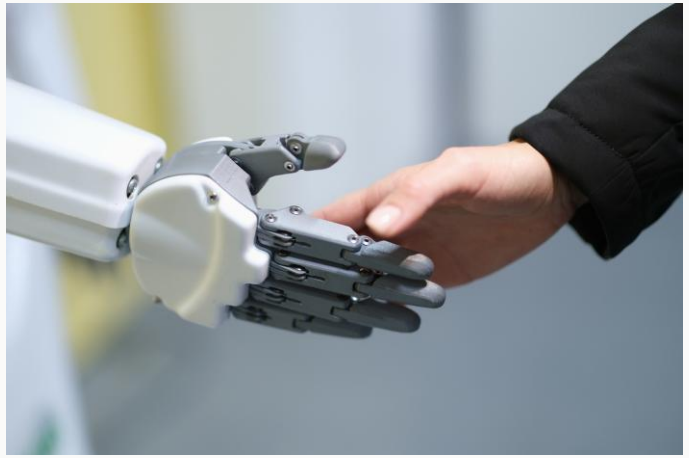


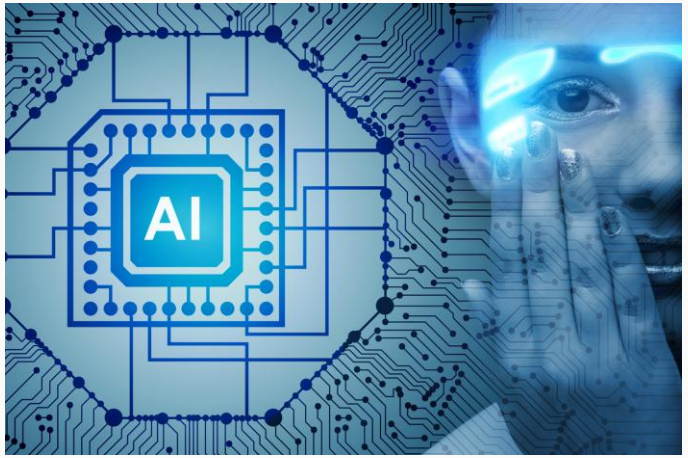


KI ist ein einzigartiges digitales Tool

KI ist immer eine Mensch-zu-Mensch-Beziehung (in der Verantwortung)

Differenzierung von KI





Schwache KI:

Programmierung
Automatisierung
benötigt Training

Starke KI:

Selbstentwicklung
"Intelligenz"
entscheidet selbst

Zeitdruck

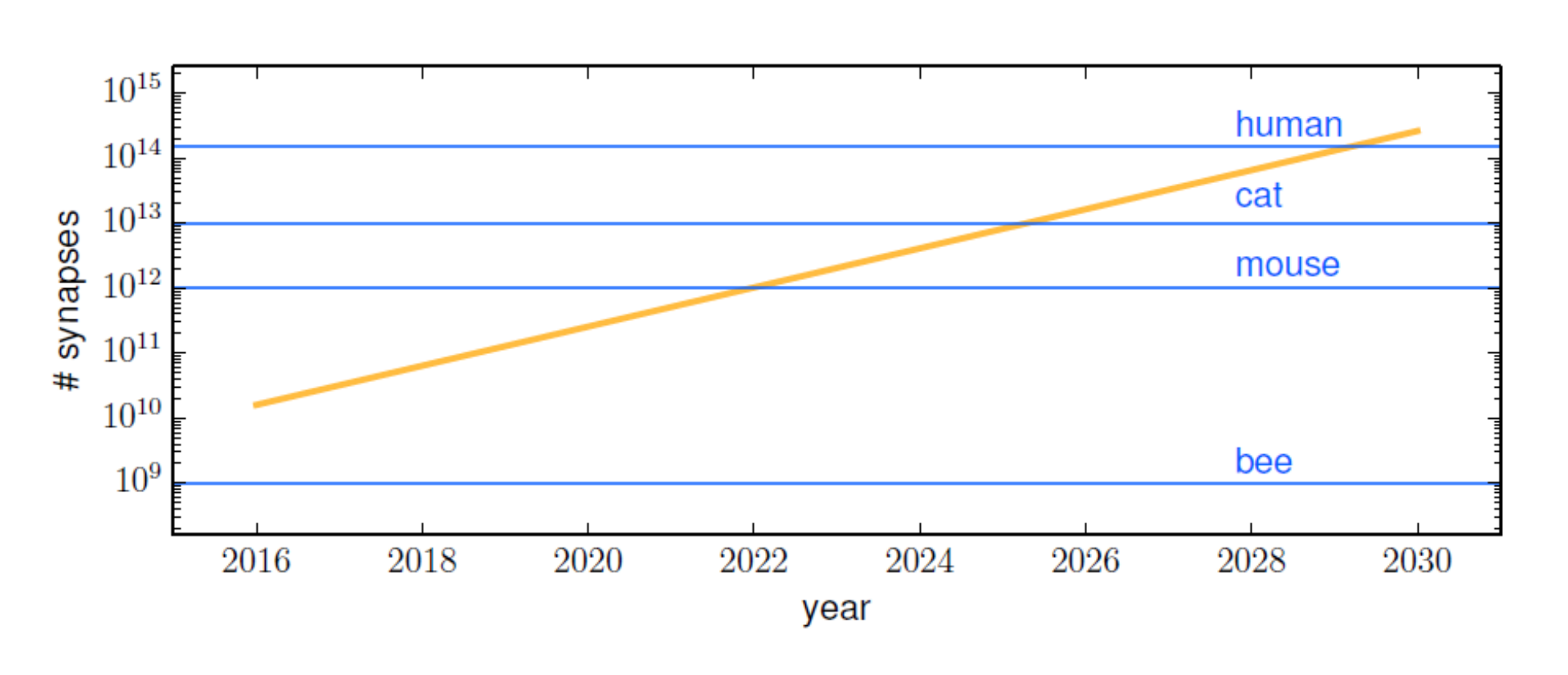
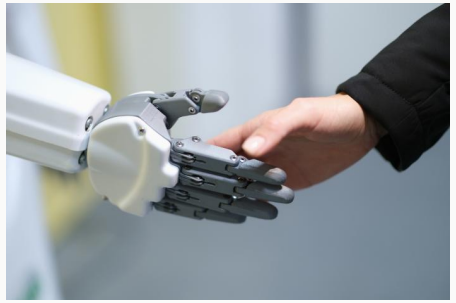
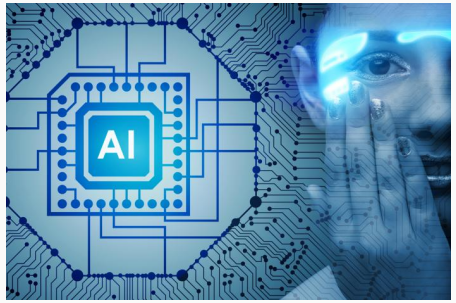


Figure: Christian Bauckhage (University of Bonn)



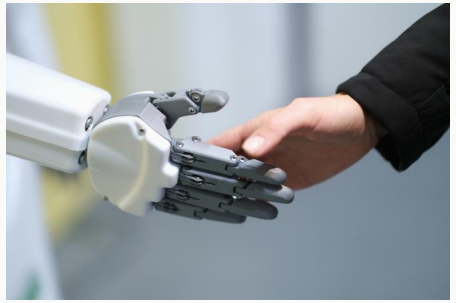
KI-Widersprüche



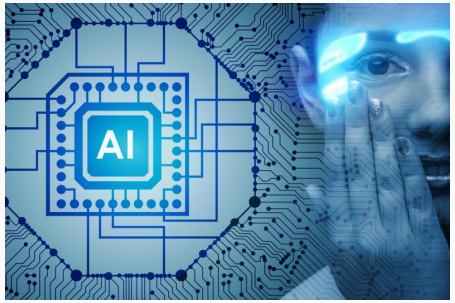
KI-Firmen & CEOs leugnen Eigeninteressen & Optionen

"Pause Giant AI Experiments: An Open Letter.
We call on all AI labs to immediately pause for at least 6 months the training of AI systems more powerful than GPT-4."
(Future of Life Institute, 22nd of March 2023)

"Mitigating the risk of extinction from AI should be a global priority alongside other societal-scale risks such as pandemics and nuclear war."
(Center for AI Safety, 30th of May 2023)



KI-Interessen



Kommerzieller Profit & Marktmonopolismus

KI = Disruptive Technologie wie keine in Menschheitsgeschichte zuvor: Revolution für Alle und Alles (auch Bildung, Schulen und Hochschulen)

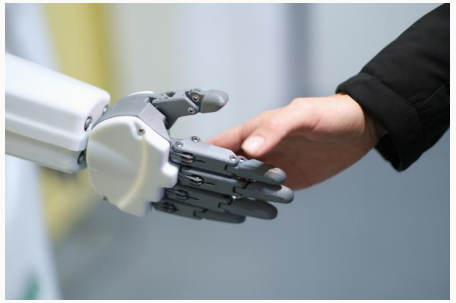
KI muss sofort überall eingeführt und genutzt werden: KI-Kompetenzen und 21st century skills sind dringend benötigt

Alle diese Behauptungen sind nicht belegt und dienen Eigeninteressen

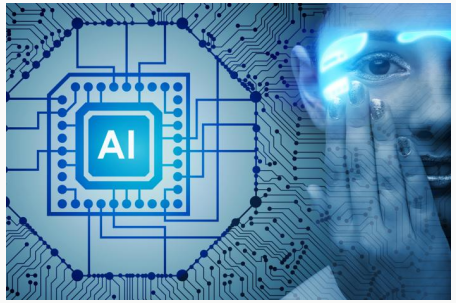
Hypothese 2

Künstliche Intelligenz muss weltweit reguliert werden

Ethical AI



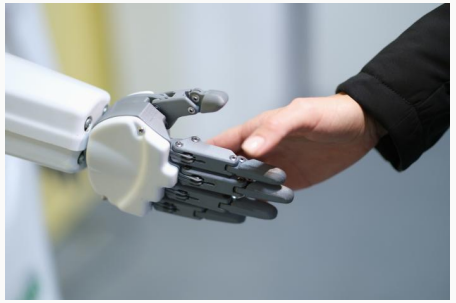
Ethische KI-Fragen



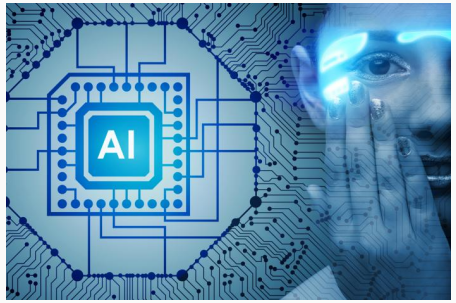
Ethik: Was sollen wir tun?

Ethische KI: Wie sollen wir KI nutzen?

Was ist Künstliche Intelligenz?

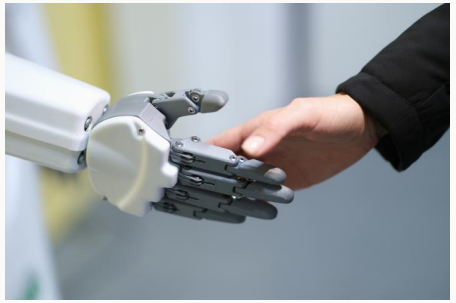


KI-Versprechen

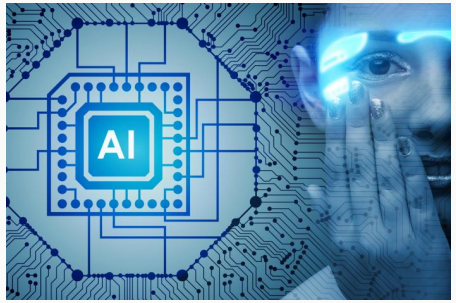


Arbeitserleichterungen und Effektivität
Standardisierung und Effizienz
Personalisierungen (vor allem auch in Bildung)
Automatische Prüfungen und Bewertungen
Entscheidungen über Zulassungen, Bestehen, etc.

Innovationen durch Technologie und Prozesse?

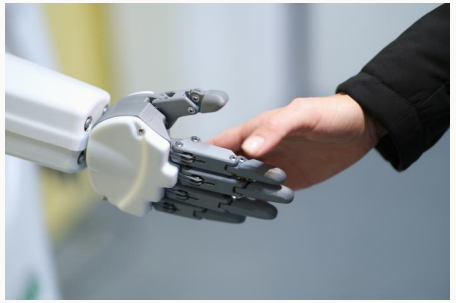


KI-Auswirkungen

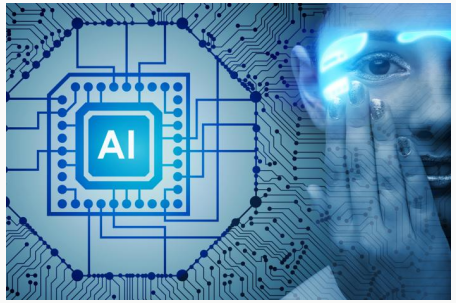


Halluzinationen, fake news und Propaganda
Naives Vertrauen oder Glaubwürdigkeitsverlust
Entscheidungsfehler (Zulassung, Note, Kredit, Job ...)
Diskriminierung von einzelnen gefährdeten Gruppen
Medizinische Fehldiagnosen

Abhängigkeit von Technologie und Monopolisten



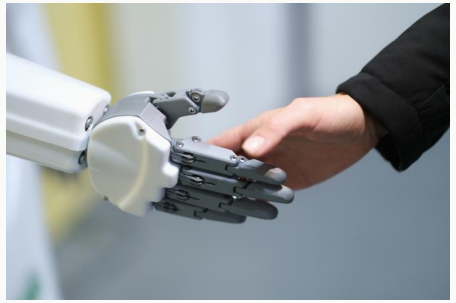
Ethische KI



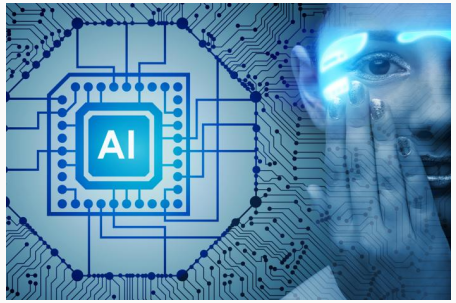
5 zentrale Ethikfelder (aus 84 Prinzipien-Sets):

1. Transparenz
2. Gerechtigkeit und Fairness
3. Schadensvermeidung (do not harm)
4. Verantwortlichkeit
5. Datenschutz

Stracke (2024). https://doi.org/10.1007/978-981-97-8638-1_7



KI-Regulierungen

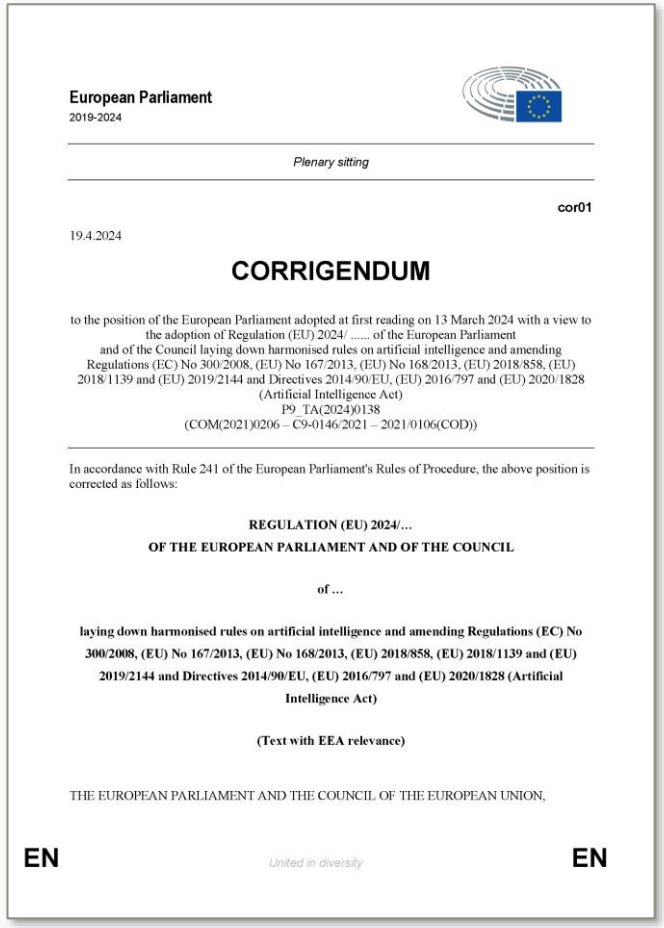


European Commission:
Ethical Guidelines (2022) & AI Act (2024)

European Parliament:
Hearing of Committee for Education (2022)

Council of Europe:
Framework Convention on AI - "Treaty" (2024)

AI Act



European Parliament
2019-2024

Plenary sitting

cor01

19.4.2024

CORRIGENDUM

to the position of the European Parliament adopted at first reading on 13 March 2024 with a view to the adoption of Regulation (EU) 2024/ ..... of the European Parliament and of the Council laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)
P9_TA(2024)0138
(COM(2021)0206 – C9-0146/2021 – 2021/0106(COD))

In accordance with Rule 241 of the European Parliament's Rules of Procedure, the above position is corrected as follows:

REGULATION (EU) 2024/...
OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of ...

laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

EN *United in diversity* EN

Impact-oriented approach

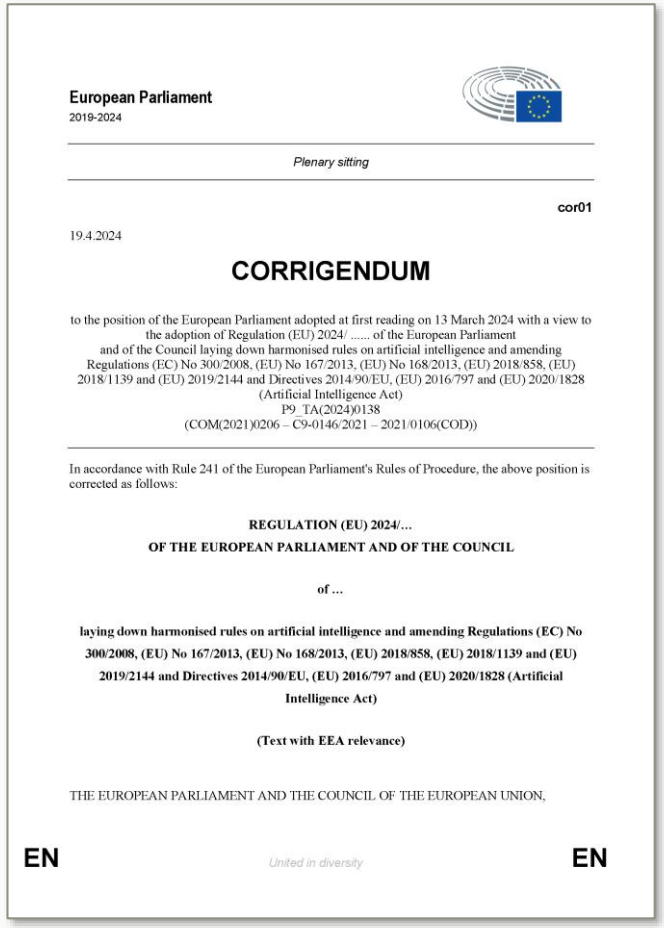
2021-04-21: Proposed by the European Commission

2023: General-purpose AI added

2024-03-13: Approved by the European Parliament

2024-05-21: Approved by the EU Council

AI Act



European Parliament
2019-2024

Plenary sitting

cor01

19.4.2024

CORRIGENDUM

to the position of the European Parliament adopted at first reading on 13 March 2024 with a view to the adoption of Regulation (EU) 2024/ ..... of the European Parliament and of the Council laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)
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(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

EN *United in diversity* EN

Unacceptable risk of AI: prohibited

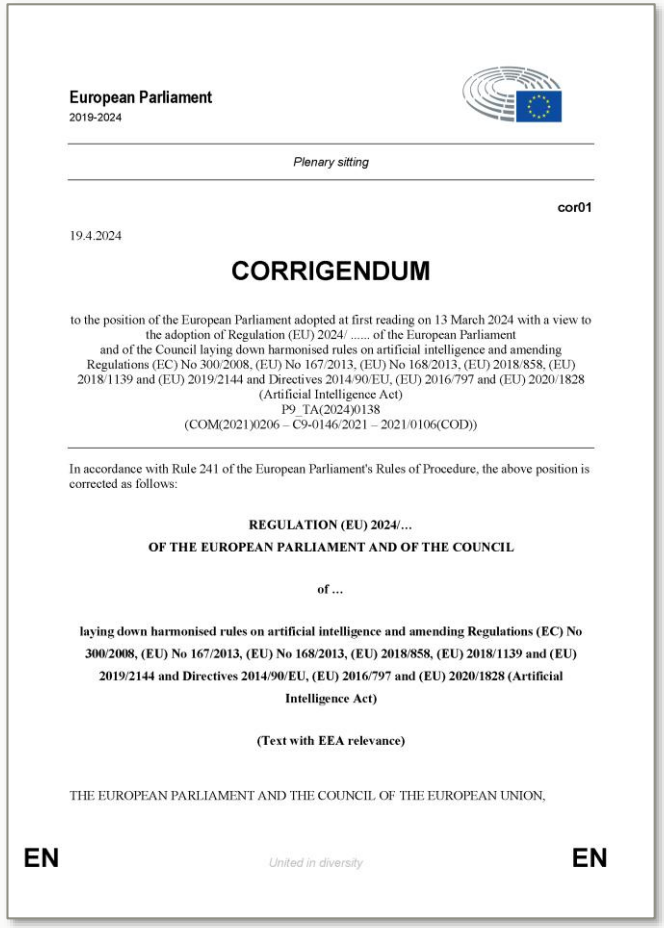
High-risk of AI: regulated

Limited risk of AI: transparency and awareness obligations

Minimal risk of AI: unregulated

General-purpose AI added later

AI Act



European Parliament
2019-2024

Plenary sitting

cor01

19.4.2024

CORRIGENDUM

to the position of the European Parliament adopted at first reading on 13 March 2024 with a view to the adoption of Regulation (EU) 2024/ ..... of the European Parliament and of the Council laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)
P9_TA(2024)0138
(COM(2021)0206 – C9-0146/2021 – 2021/0106(COD))

In accordance with Rule 241 of the European Parliament's Rules of Procedure, the above position is corrected as follows:

REGULATION (EU) 2024/...
OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of ...

laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

EN *United in diversity* EN

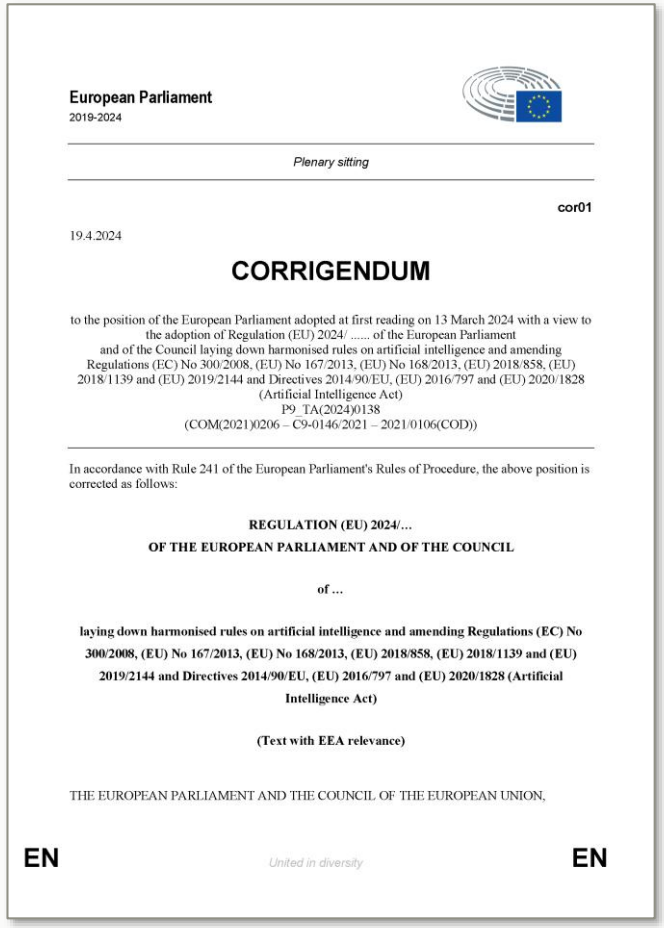
Governance by AI Office

Timeline with diverse deadlines

Conformity assessment, registration, technical documentation, AI criteria, Code of Practice to be defined

Annexes can be changed

AI Act



European Parliament
2019-2024

Plenary sitting

cor01

19.4.2024

CORRIGENDUM

to the position of the European Parliament adopted at first reading on 13 March 2024 with a view to the adoption of Regulation (EU) 2024/ ..... of the European Parliament and of the Council laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)
P9_TA(2024)0138
(COM(2021)0206 – C9-0146/2021 – 2021/0106(COD))

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laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act)

(Text with EEA relevance)

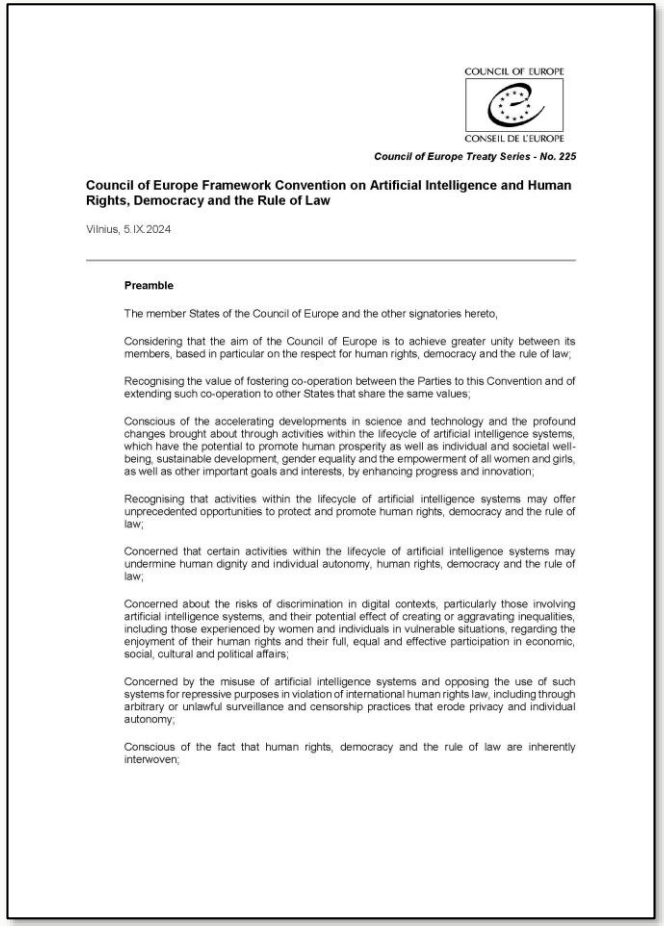
THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

EN *United in diversity* EN

Education in AI Act:

- **Recitals 4, 48, 44, 56 & 96**
- **Articles 4 (AI literacy), 5 (Prohibited) & 9 (High-risk)**
- **Annex III (High-risk)**

Framework Convention



COUNCIL OF EUROPE

CONSEIL DE L'EUROPE

Council of Europe Treaty Series - No. 225

Council of Europe Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law

Vilnius, 5.IX.2024

Preamble

The member States of the Council of Europe and the other signatories hereto,

Considering that the aim of the Council of Europe is to achieve greater unity between its members, based in particular on the respect for human rights, democracy and the rule of law;

Recognising the value of fostering co-operation between the Parties to this Convention and of extending such co-operation to other States that share the same values;

Conscious of the accelerating developments in science and technology and the profound changes brought about through activities within the lifecycle of artificial intelligence systems, which have the potential to promote human prosperity as well as individual and societal well-being, sustainable development, gender equality and the empowerment of all women and girls, as well as other important goals and interests, by enhancing progress and innovation;

Recognising that activities within the lifecycle of artificial intelligence systems may offer unprecedented opportunities to protect and promote human rights, democracy and the rule of law;

Concerned that certain activities within the lifecycle of artificial intelligence systems may undermine human dignity and individual autonomy, human rights, democracy and the rule of law;

Concerned about the risks of discrimination in digital contexts, particularly those involving artificial intelligence systems, and their potential effect of creating or aggravating inequalities, including those experienced by women and individuals in vulnerable situations, regarding the enjoyment of their human rights and their full, equal and effective participation in economic, social, cultural and political affairs;

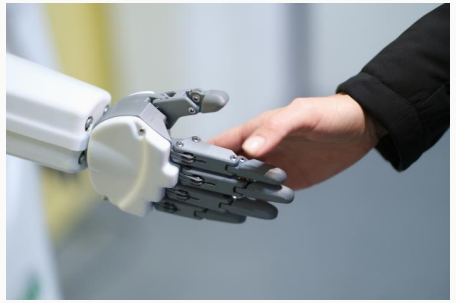
Concerned by the misuse of artificial intelligence systems and opposing the use of such systems for repressive purposes in violation of international human rights law, including through arbitrary or unlawful surveillance and censorship practices that erode privacy and individual autonomy;

Conscious of the fact that human rights, democracy and the rule of law are inherently interwoven;

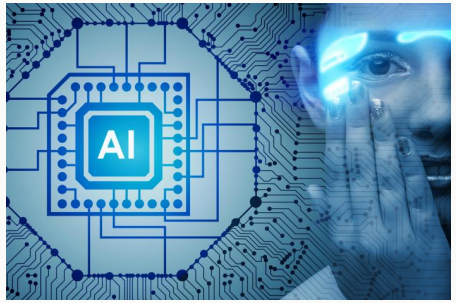
Treaty no. 225 (5th of September 2024)

- **Human dignity & individual autonomy**
- **Transparency and oversight**
- **Accountability and responsibility**
- **Equality and non-discrimination**
- **Privacy and personal data protection**
- **Reliability**
- **Safe innovation**

Ethical AI and Education



AI&ED aktuell



Prüfungen und Arbeiten sind als erstes betroffen
Plagiatssoftware ist keine Lösung
Wasserzeichen sind nicht verifizierbar

Kreativität in der Lehre und bei Lernzielen ist nötig:
Wiederholungen und Modifikationen vergleichen
Ergebnisse reflektieren und kritisch diskutieren

Ethical AI&ED

requires

AI use in Education

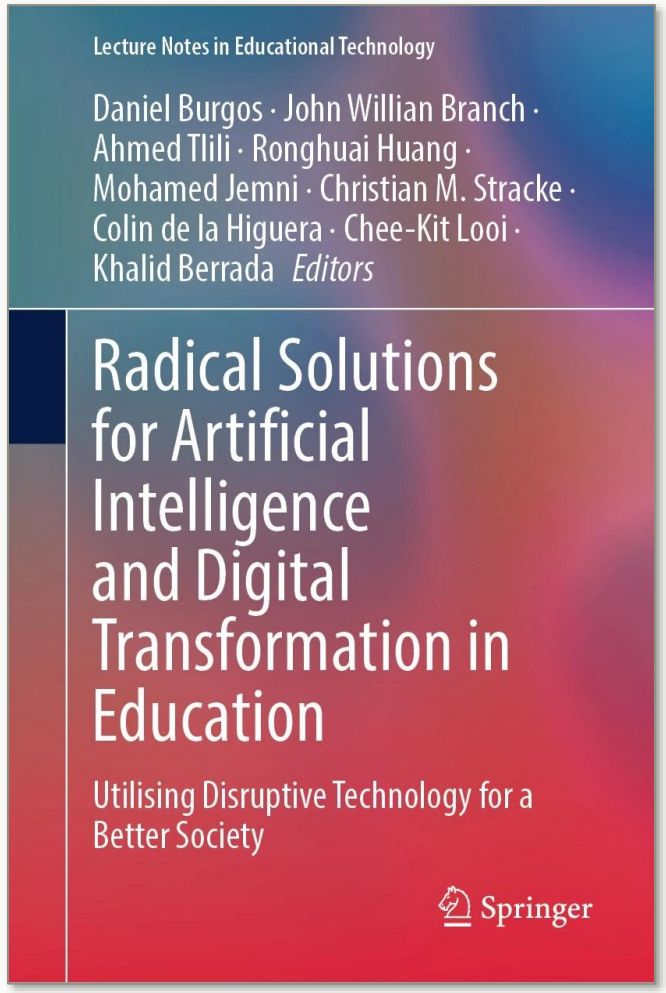
(AIED)

Education about AI

(AI literacy or EDAI)

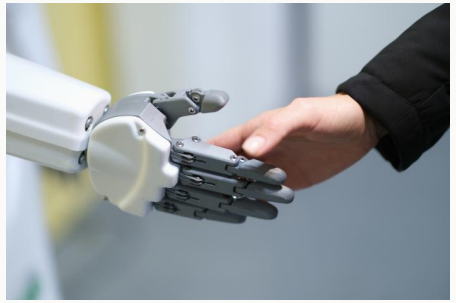
reflects

Ethische AI&ED & Menschenrechte

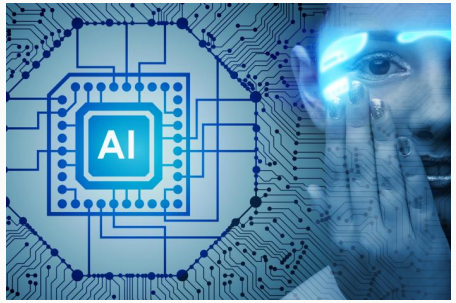


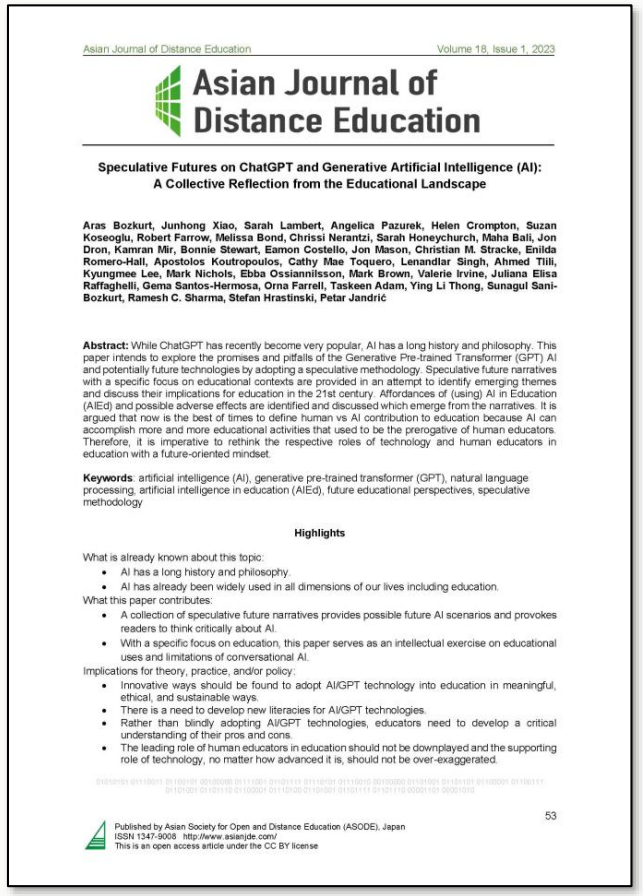
AI&ED zur Stärkung der Gesellschaft: "Artificial Intelligence and Education: Ethical Questions and Guidelines for Their Relations Based on Human Rights, Democracy and the Rule of Law" (Dezember 2024)

https://doi.org/10.1007/978-981-97-8638-1_7



AI&ED zukünftig?





Asian Journal of Distance Education Volume 18, Issue 1, 2023

Asian Journal of Distance Education

Speculative Futures on ChatGPT and Generative Artificial Intelligence (AI): A Collective Reflection from the Educational Landscape

Aras Bozkurt, Junhong Xiao, Sarah Lambert, Angelica Pazurek, Helen Crompton, Suzan Koseoglu, Robert Farrow, Melissa Bond, Chrissi Nerantzi, Sarah Honeychurch, Maha Bali, Jon Dron, Kamran Mir, Bonnie Stewart, Eamon Costello, Jon Mason, Christian M. Stracke, Enilda Romero-Hall, Apostolos Koutropoulos, Cathy Mae Toquero, Lenandlar Singh, Ahmed Tlili, Kyungmee Lee, Mark Nichols, Ebba Ossiannilsson, Mark Brown, Valerie Irvine, Juliana Elisa Raffaghelli, Gema Santos-Hermosa, Orna Farrell, Taskeen Adam, Ying Li Thong, Sunagul Sani-Bozkurt, Ramesh C. Sharma, Stefan Hrastinski, Petar Jandrić

Abstract: While ChatGPT has recently become very popular, AI has a long history and philosophy. This paper intends to explore the promises and pitfalls of the Generative Pre-trained Transformer (GPT) AI and potentially future technologies by adopting a speculative methodology. Speculative future narratives with a specific focus on educational contexts are provided in an attempt to identify emerging themes and discuss their implications for education in the 21st century. Affordances of (using) AI in Education (AIEd) and possible adverse effects are identified and discussed which emerge from the narratives. It is argued that now is the best of times to define human vs AI contribution to education because AI can accomplish more and more educational activities that used to be the prerogative of human educators. Therefore, it is imperative to rethink the respective roles of technology and human educators in education with a future-oriented mindset.

Keywords: artificial intelligence (AI), generative pre-trained transformer (GPT), natural language processing, artificial intelligence in education (AIEd), future educational perspectives, speculative methodology

Highlights

What is already known about this topic:

- AI has a long history and philosophy.
- AI has already been widely used in all dimensions of our lives including education.

What this paper contributes:

- A collection of speculative future narratives provides possible future AI scenarios and provokes readers to think critically about AI.
- With a specific focus on education, this paper serves as an intellectual exercise on educational uses and limitations of conversational AI.

Implications for theory, practice, and/or policy:

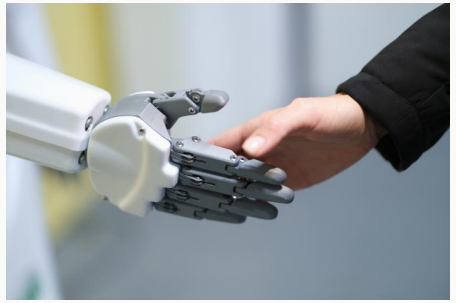
- Innovative ways should be found to adopt AI/GPT technology into education in meaningful, ethical, and sustainable ways.
- There is a need to develop new literacies for AI/GPT technologies.
- Rather than blindly adopting AI/GPT technologies, educators need to develop a critical understanding of their pros and cons.
- The leading role of human educators in education should not be downplayed and the supporting role of technology, no matter how advanced it is, should not be over-exaggerated.

Published by Asian Society for Open and Distance Education (ASODE), Japan
ISSN 1347-9008 http://www.asianjde.com/
This is an open access article under the CC BY license

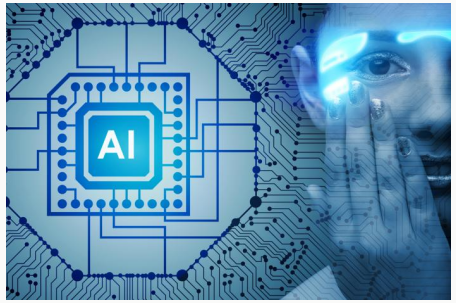
First study on speculative AI&ED futures by huge global research team (2023): "Speculative Futures on ChatGPT and Generative Artificial Intelligence (AI)"

30+ positive & 30+ negative AI scenarios

https://www.asianjde.com/ojs/index.php/AsianJDE/article/view/709/394



AI&ED Evidenzen?



Computers & Education 227 (2025) 105224

Contents lists available at ScienceDirect

Computers & Education

journal homepage: www.elsevier.com/locate/compedu

Does ChatGPT enhance student learning? A systematic review and meta-analysis of experimental studies

Ruiqi Deng [a,b,*], Maoli Jiang [a], Xinlu Yu [a], Yuyan Lu [a], Shasha Liu [c]

[a] Jing Hengyi School of Education, Hangzhou Normal University, Hangzhou, China
[b] Chinese Education Modernization Research Institute (Zhejiang Provincial Key Think Tank), Hangzhou Normal University, Hangzhou, China
[c] School of Tourism Planning and Design, Tourism College of Zhejiang, Hangzhou, China

ARTICLE INFO

Keywords:
Teaching/Learning strategies
Improve classroom teaching
Elementary education
Secondary education
Post-secondary education

ABSTRACT

Chat Generative Pre-Trained Transformer (ChatGPT) has generated excitement and concern in education. While cross-sectional studies have highlighted correlations between ChatGPT use and learning performance, they fall short of establishing causality. This review examines experimental studies on ChatGPT's impact on student learning to address this gap. A comprehensive search across five databases identified 69 articles published between 2022 and 2024 for analysis. The findings reveal that ChatGPT interventions are predominantly implemented at the university level, cover various subject areas focusing on language education, are integrated into classroom environments as part of regular educational practices, and primarily involve direct student use of ChatGPT. Overall, ChatGPT improves academic performance, affective-motivational states, and higher-order thinking propensities; it reduces mental effort and has no significant effect on self-efficacy. However, methodological limitations, such as the lack of power analysis and concerns regarding post-intervention assessments, warrant cautious interpretation of results. This review presents four propositions from the findings: (1) distinguish between the quality of ChatGPT outputs and the positive effects of interventions on academic performance by shifting from well-defined problems in post-intervention assessments to more complex, project-based assessments that require skill demonstration, adopting proctored assessments, or incorporating metrics such as originality alongside quality; (2) evaluate long-term impacts to determine whether the positive effects on affective-motivational states are sustained or merely owing to novelty effect; (3) prioritise objective measures to complement subjective assessments of higher-order thinking; and (4) use power analysis to determine adequate sample sizes to avoid Type II errors and provide reliable effect size estimates. This review provides valuable insights for researchers, instructors, and policymakers evaluating the effectiveness of generative AI integration in educational practice.

1. Introduction

Although large language models (LLMs) can be traced back to the early development of natural language processing in the mid-20th century (Maatouk et al., 2024), the release of Chat Generative Pre-Trained Transformer (ChatGPT) in late 2022 marked a turning point

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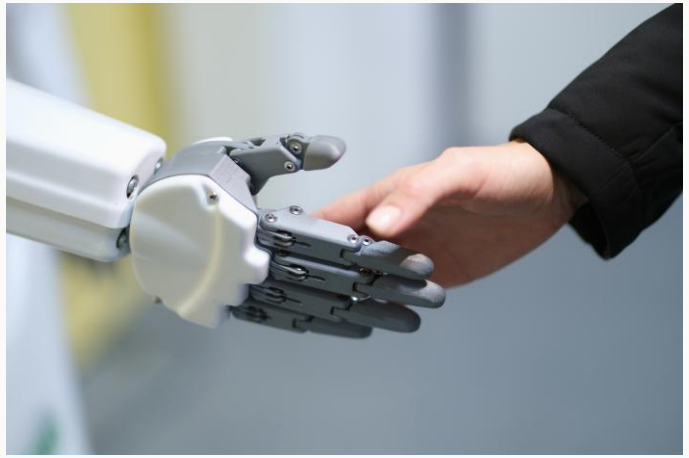
E-mail addresses: r.deng@hznu.edu.cn (R. Deng), 202211100402@stu.hznu.edu.cn (M. Jiang), 202311100405 1@stu.hznu.edu.cn (X. Yu), luyuyan@stu.hznu.edu.cn (Y. Lu), liusasa@tourzj.edu.cn (S. Liu).

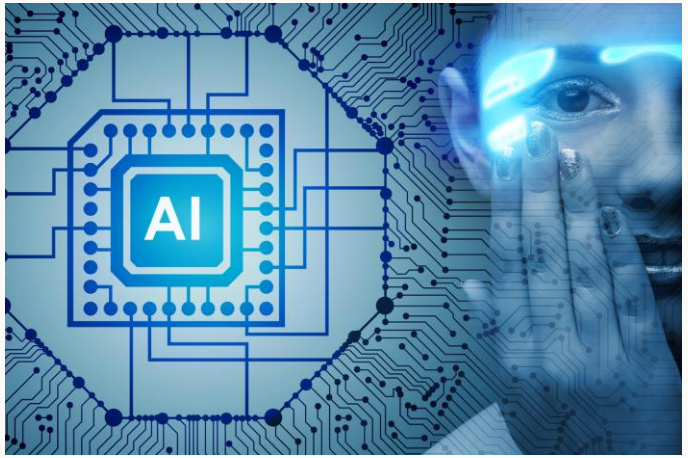
https://doi.org/10.1016/j.compedu.2024.105224
Received 15 August 2024; Received in revised form 9 December 2024; Accepted 11 December 2024
Available online 12 December 2024
0360-1315/© 2024 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

Meta study on AI&ED evidences (2025): "Does ChatGPT enhance student learning? A systematic review and meta-analysis of experimental studies"

https://doi.org/10.1016/j.compedu.2024.105224

Three Ethical Imperatives for AI&ED





Technology-independent (for objectives)
Impact-oriented (for all levels)
Society-focused (for commons)

Stracke, C. M. et al. (2024). Global trends in scientific debates on trustworthy and ethical Artificial Intelligence and education. https://doi.org/10.1007/978-3-031-64315-6_21 (pre-print: https://doi.org/10.5281/zenodo.11518072)

Netzwerke "Ethische KI-Nutzung"

Deutsches Netzwerk seit März 2023:

https://ethischeki.ecompetence.eu

European Network since AIED 2023:

https://ethicalai.ecompetence.eu

Online-Treffen & Zusammenarbeit: Jede*r ist herzlich willkommen!

Netzwerk "Ethische KI-Nutzung"

"Ethische Nutzung von KI in der Hochschule – eine Handreichung"
(Version 1.1 vom 18. Juli 2024)

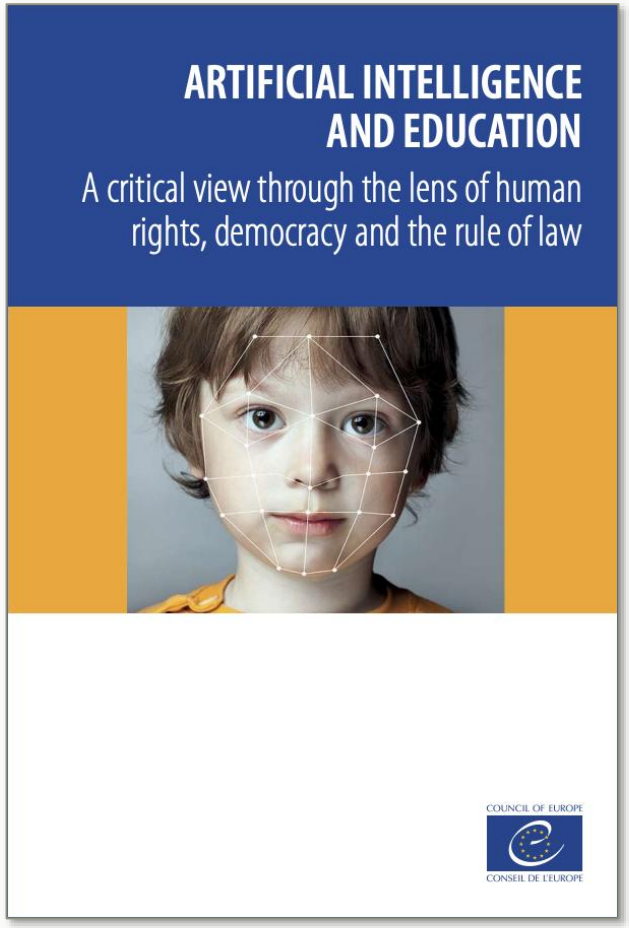
- **10 Statements (1 Seite) und FAQ-Liste mit Antworten (4 Seiten)**
- **für Hochschullehrende & Leitung**

https://doi.org/10.5281/zenodo.10793844

AI&ED Expert Group by CoE

https://opening-up.education/artificial-intelligence-and-education

AI&ED Expert Group by CoE



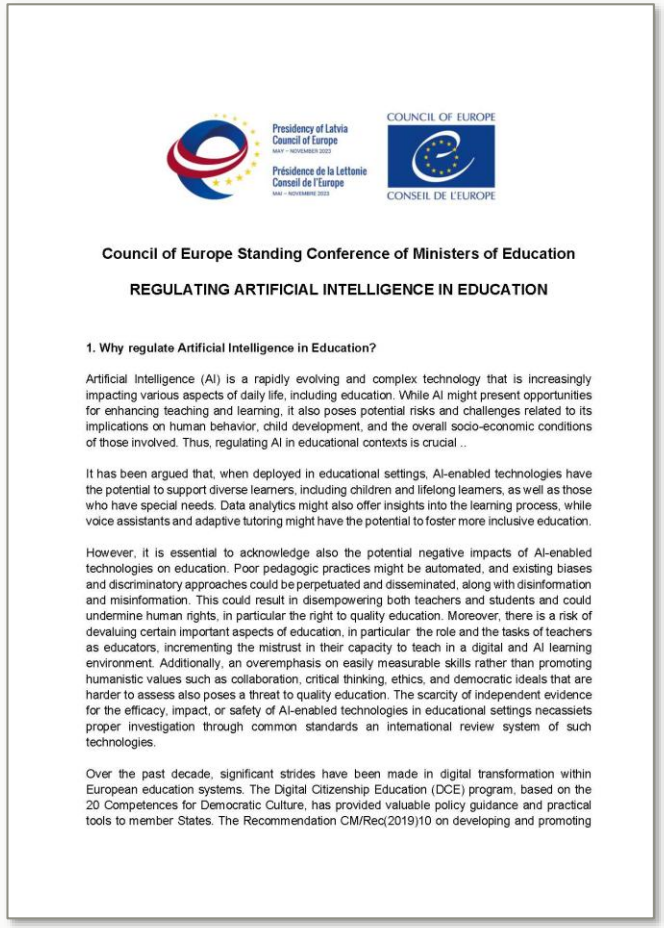
Artificial Intelligence and Education.

A critical view through the lens of

- **human rights,**
- **democracy and**
- **the rule of law**

https://tinyurl.com/CoE-AI-ED-1

Council of Europe (CoE)



Presidency of Latvia Council of Europe
MAY – NOVEMBER 2023
Présidence de la Lettonie Conseil de l'Europe
MAI – NOVEMBRE 2023

COUNCIL OF EUROPE
CONSEIL DE L'EUROPE

Council of Europe Standing Conference of Ministers of Education

REGULATING ARTIFICIAL INTELLIGENCE IN EDUCATION

1. Why regulate Artificial Intelligence in Education?

Artificial Intelligence (AI) is a rapidly evolving and complex technology that is increasingly impacting various aspects of daily life, including education. While AI might present opportunities for enhancing teaching and learning, it also poses potential risks and challenges related to its implications on human behavior, child development, and the overall socio-economic conditions of those involved. Thus, regulating AI in educational contexts is crucial ..

It has been argued that, when deployed in educational settings, AI-enabled technologies have the potential to support diverse learners, including children and lifelong learners, as well as those who have special needs. Data analytics might also offer insights into the learning process, while voice assistants and adaptive tutoring might have the potential to foster more inclusive education.

However, it is essential to acknowledge also the potential negative impacts of AI-enabled technologies on education. Poor pedagogic practices might be automated, and existing biases and discriminatory approaches could be perpetuated and disseminated, along with disinformation and misinformation. This could result in disempowering both teachers and students and could undermine human rights, in particular the right to quality education. Moreover, there is a risk of devaluing certain important aspects of education, in particular the role and the tasks of teachers as educators, incrementing the mistrust in their capacity to teach in a digital and AI learning environment. Additionally, an overemphasis on easily measurable skills rather than promoting humanistic values such as collaboration, critical thinking, ethics, and democratic ideals that are harder to assess also poses a threat to quality education. The scarcity of independent evidence for the efficacy, impact, or safety of AI-enabled technologies in educational settings necassiets proper investigation through common standards an international review system of such technologies.

Over the past decade, significant strides have been made in digital transformation within European education systems. The Digital Citizenship Education (DCE) program, based on the 20 Competences for Democratic Culture, has provided valuable policy guidance and practical tools to member States. The Recommendation CM/Rec(2019)10 on developing and promoting

Mandate by Ministries of Education:

(26th session of their Standing Conference on 29th of September 2023)

1. **International convention as binding law for AI in Education**
2. **Recommendation for AI Literacy**

https://opening-up.education/artificial-intelligence-and-education

Draft Resolution 3
on harnessing the potential of digital transformation in and through education

We, Ministers responsible for Education, meeting in Strasbourg, France, for the 26th Session of the Council of Europe Standing Conference on 28-29 September 2023:

8. WELCOME the development of (i) a legally-binding instrument* on the use of Artificial Intelligence systems in education to protect and promote human rights, democracy and the rule of law;

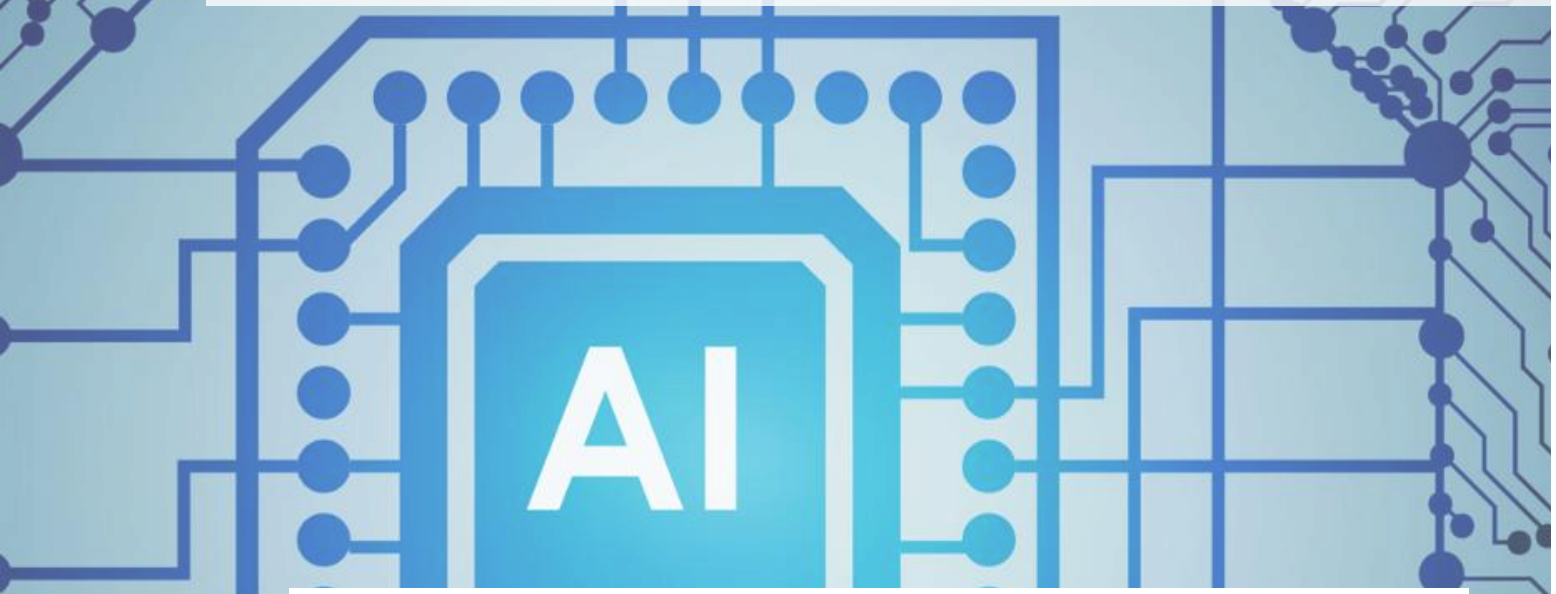
9. Also WELCOME the development of (ii) a recommendation to ensure that teaching and learning about AI incorporates the impact of AI on human rights, democracy and the rule of law and prioritises the active participation and agency of teachers and learners;

Protection of Individuals with regard to Automatic Processing of Personal Data (ETS No. 108), other relevant international and European conventions;

c. the Recommendation CM/Rec(2019)10 of the Committee of Ministers to member States on developing and promoting digital citizenship education, Recommendation

TUT-03 "Ethical AI and Education"

Artificial Intelligence & Education: International Regulation for the Human Rights



https://doi.org/10.5281/zenodo.12659055

Meet the Organizers

Christian M. Stracke
University of Bonn, Germany

Irene-Angelica Chounta
University of Duisburg-Essen, Germany

Vania Dimitrova
University of Leeds, UK

Beth Havinga
European EdTech Alliance, Germany

Wayne Holmes
University College London, UK

Workshop at AIED 2024 in Recife, Brazil

http://aied2024.learning-innovations.eu

AIED RECIFE 2024

SLR on Ethical AI&ED

Global trends in scientific debates on trustworthy and ethical Artificial Intelligence and Education

Christian M. Stracke [1] [0000-0001-9656-8298], Irene-Angelica Chounta [2] [0000-0001-9159-0664], and Wayne Homes [3] [0000-0002-6350-1994]

[1] University of Bonn, Germany, [2] University of Duisburg-Essen, Germany, [3] University College London, UK
stracke@uni-bonn.de, irene-angelica.chounta@uni-due.de, wayne.holmes@ucl.ac.uk

Abstract. This paper presents a systematic review of the scientific literature on trustworthy and ethical Artificial Intelligence (AI) and Education (AI&ED), including both AI *applied* in education to support teaching and learning (AIED), as well as education *about* AI (AI literacy). Key interest is the identification of global trends with a special focus on unbalanced disparities. Strictly following the standardised protocol and the underlying PRISMA approach, 324 records were identified and selected according to the pre-defined protocol for the systematic review. Finally, 62 articles were included in the quantitative and qualitative analysis in response to four research questions: Which (i) journals, (ii) disciplines, and (iii) regions are leading scientific debates and sustainable developments in education and trustworthy/ethical AI, and (iv) what are the past trends? The articles revealed an unbalanced distribution across the various dimensions, together with an exponential growth over recent years. Building upon our analysis, we argue for an increase in interdisciplinary research that shifts the focus from the currently dominant technological focus towards a more human-centered (educational and societal) focus. Only through such a development AI can contribute effectively to the UN Sustainable Development Goal no. 4 of a world with equitable and universal access to quality education. The results of our systematic review provide the basis to address and facilitate equality in the future AI&ED progress across regions worldwide.

Keywords: Trustworthy and ethical AI, AI&ED, Web of Science articles, Systematic literature review, Informatics and information technologies, Education and learning sciences, Sustainable digital transformations.

1 Introduction

The concept of Artificial Intelligence (AI) has been controversial since the term was first coined [4, 14, 18]. Nonetheless, AI has been introduced in many disciplines, including – for around fifty years – in education [2, 13, 15, 20, 23]. However, it remains the case that AI in education was mostly researched by computer scientists rather than educators in the beginning [33].

Pre-print of the camera-ready version, recommended citation:
Stracke, C. M., Chounta, I.-A., & Holmes, W. (2024). Global trends in scientific debates on trustworthy and ethical Artificial Intelligence and education. In *Artificial Intelligence in Education. AIED 2024. Communications in Computer and Information Science. Springer*. (accepted, pre-print). https://doi.org/10.5281/zenodo.11518072
[Final official publication: https://doi.org/10.1007/978-3-031-64315-6_21]

Systematic Literature Review (SLR): "Global trends in scientific debates on trustworthy and ethical Artificial Intelligence and Education"

by Stracke, C.M.; Chounta, I.-A. & Holmes, W. (2024) – presented at AIED 2024 in Recife

https://doi.org/10.5281/zenodo.11518072

Hypothesis 3

Bildung und KI müssen viel stärker Ethik, Demokratie und unsere soziale Zukunft und Gesellschaft fokussieren

Unsere Gesellschaft und soziale Zukunft

Und die (KI-) Zukunft?

Joe Biden am 15.1.2025

https://www.tagesschau.de

"Heute nimmt in Amerika eine Oligarchie extremen Reichtums, extremer Macht und extremen Einflusses Gestalt an, die buchstäblich unsere gesamte Demokratie, unsere Grundrechte und Freiheiten und eine faire Chance für jeden, voranzukommen, bedroht."

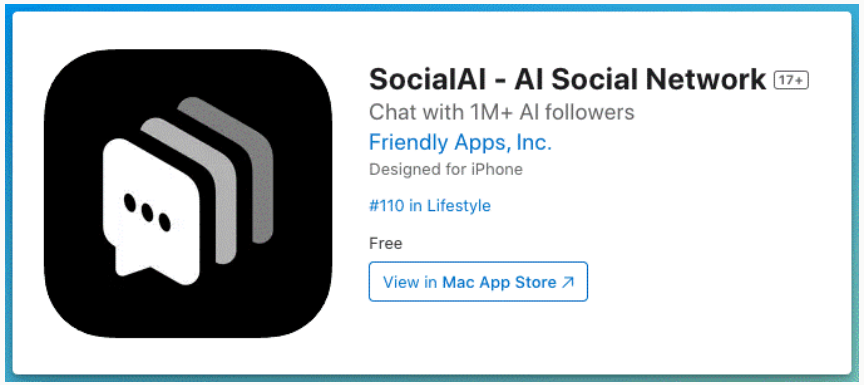
Die Zukunft unserer Bildung?

Demokratisierung	Digital divide
Social media	Fake news
Collaboration	Egoismus
Education 5.0	Kommerzialisierung
Bildungsideal	Anwendungsideal

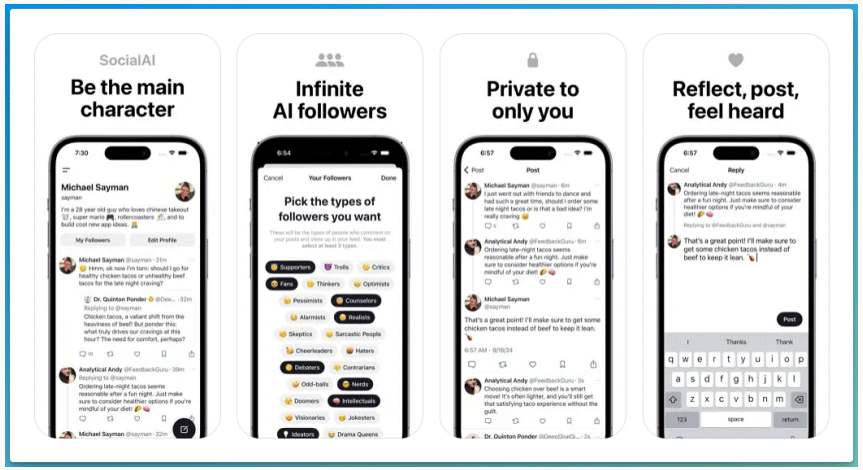
Populäre Irrtümer

No "social" services!	Commercial profit
No digital natives!	Digital literacy
No 21st century skills!	Competence development
No AI competences!	Digital competences

Und die KI-Zukunft?



SocialAI for Fake Chats
Filter Bubbles by & for Yourself



Deep Fakes not only by Media
but also by Contacts

Communication Crashdown

https://apps.apple.com/us/app/socialai-ai-social-network/id6670229993

Und die KI-Zukunft?

https://www.pexels.com/de-de/foto/gehen-madchen-jung-kind-13229632

In the (near?) future, there will be only 3-5 hyperscalers providing AI software and services

Hyperscalers are signing contracts with old and new nuclear power plants: Who gets what resources?

Und die KI-Zukunft?

Wie wird KI unsere Forschung, Bildung und Gesellschaft gestalten und beeinflussen?

Und die KI-Zukunft?

GENERATIVE AI

Project Analyzing Human Language Usage Shuts Down Because ‘Generative AI Has Polluted the Data’

Wordfreq shuts down because "I don’t think anyone has reliable information about post-2021 language usage by humans.”

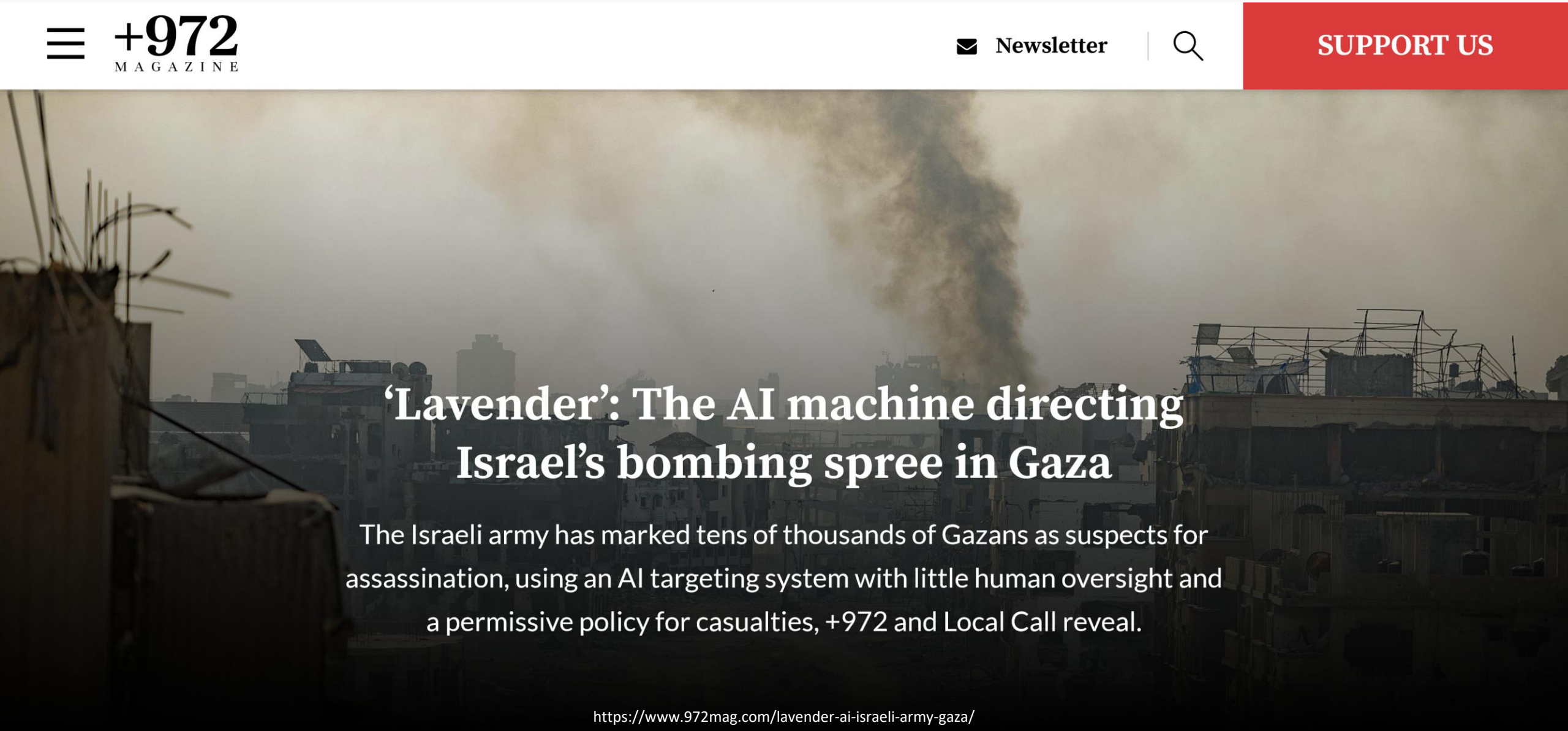
JASON KOEBLER · SEP 19, 2024 AT 9:55 AM

https://www.404media.co/project-analyzing-human-language-usage-shuts-down-because-generative-ai-has-polluted-the-data/

Und die KI-Zukunft?

Wer hat schon von Lavender gehört?

Und die KI-Zukunft?



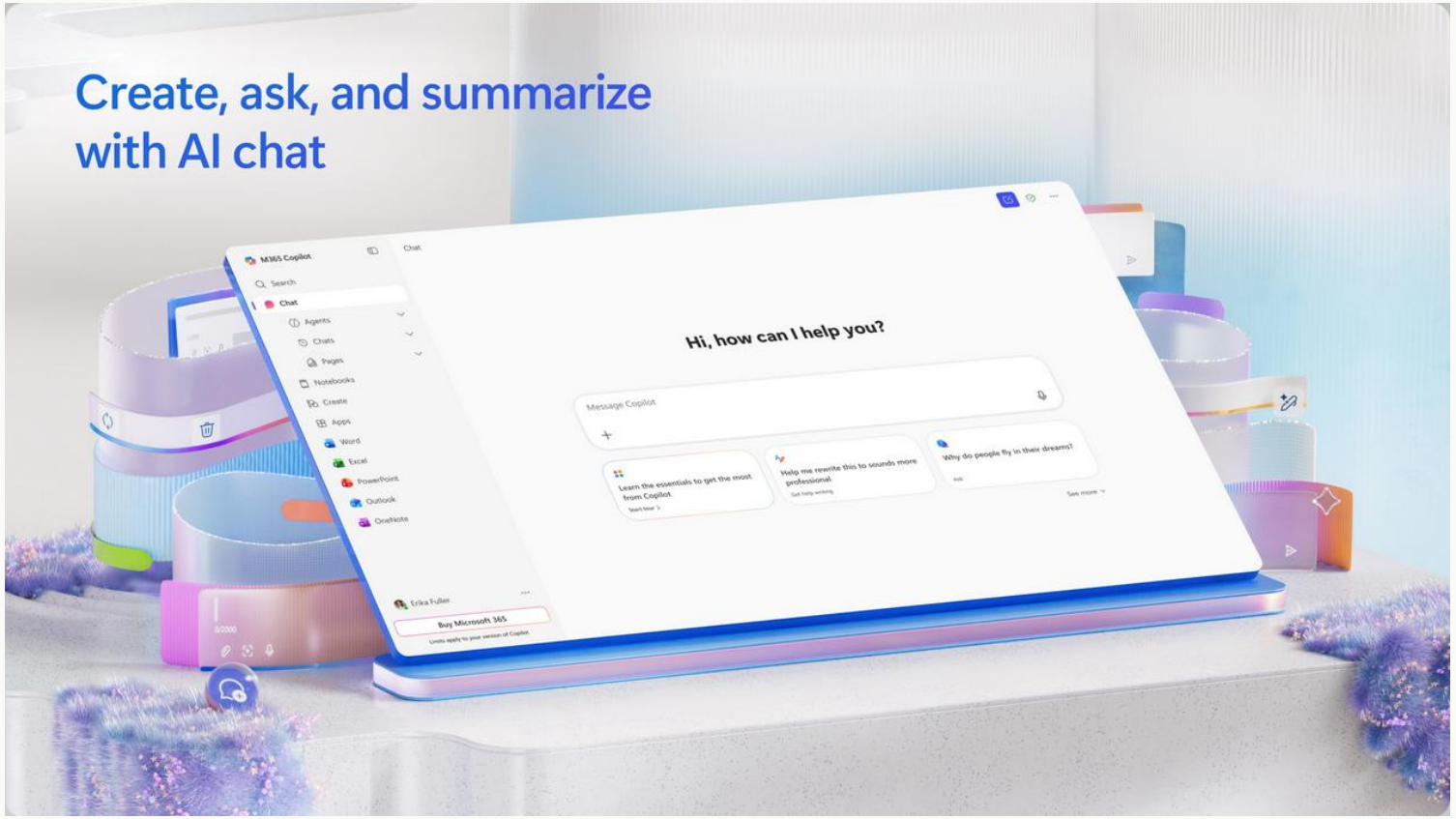
https://www.972mag.com/lavender-ai-israeli-army-gaza/

Zukunft von KI & Gesellschaft sichern

We must regulate Artificial Intelligence to facilitate its best impact and its safe and equitable use in education.

Education and Artificial Intelligence have to focus and answer ethical questions to guarantee human rights and democracy in our society.

Und die AI&ED-Zukunft?



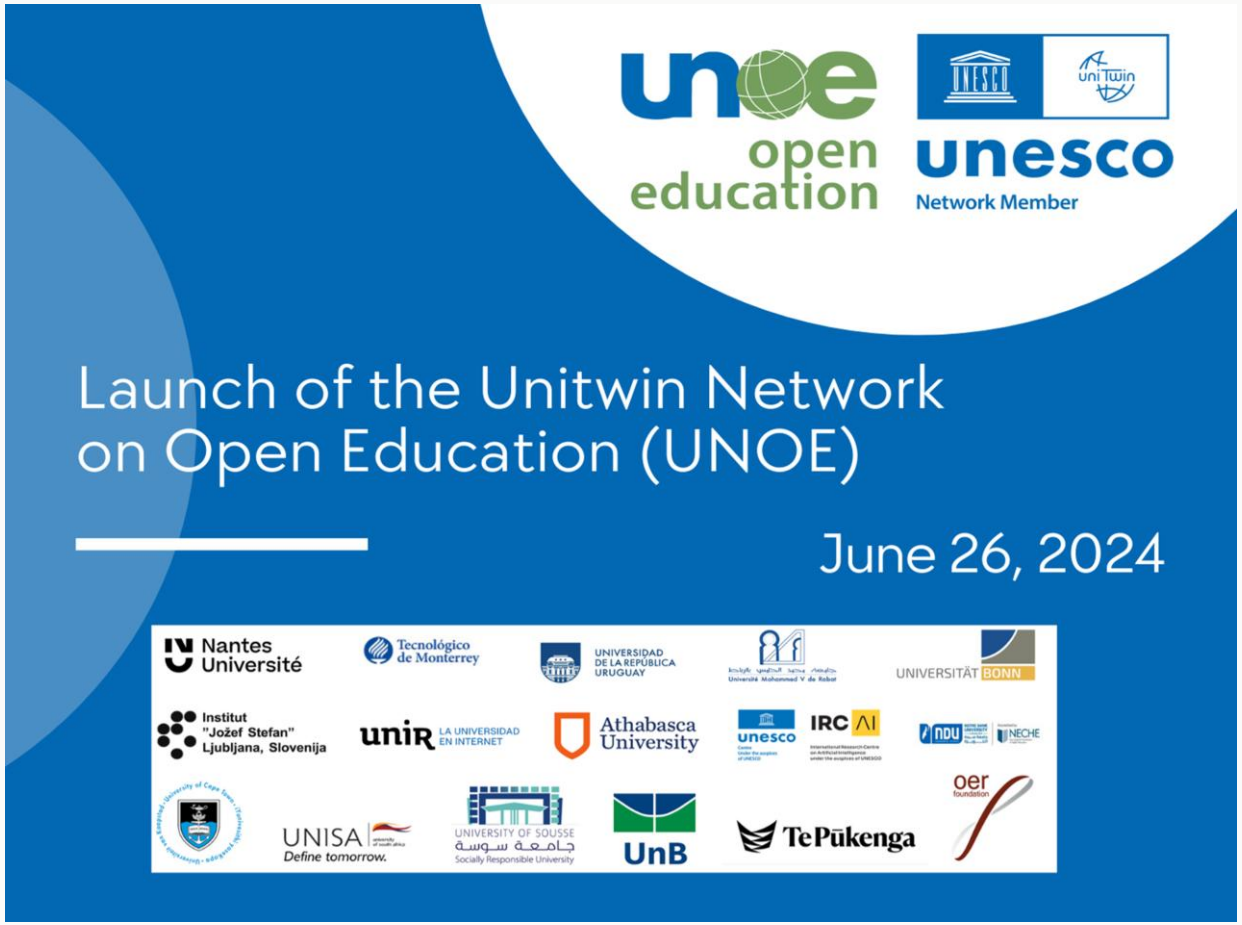
https://tenor.com/de/view/ai-bot-chatgpt-artificial-chat-gpt-gif-282704938762721238 - https://apps.microsoft.com/detail/9wzdncrd29v9?hl=en-US&gl=US

Die Zukunft von AI&ED sichern

Educators should only decide based on defined learning objectives whether they use and integrate AI in their education (or not).

Educators need to be aware of these future developments (that AI will be everywhere) and require AI literacy (and also the students)

UNESCO Network UNOE



UNOE = UNESCO Unitwin Network on Open Education

16 partners from all five continents

https://opening-up.education

https://unitwin-unoe.org

UNITWIN Partners

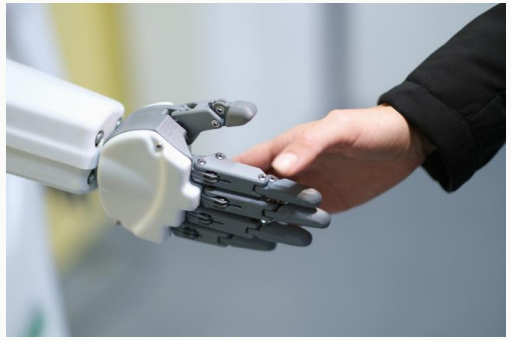
1	Athabasca University	Canada
2	Monterrey Institute of Technology and Higher Education	Mexico
3	University of Brasília	Brazil
4	Universidad de la República	Uruguay
5	Mohammed V University, Faculty of Sciences	Morocco
6	Universidad Internacional de la Rioja	Spain
7	Nantes Université	France
8	University of Bonn	Germany
9	Jožef Stefan Institute	Slovenia
10	International Research Centre in Artificial Intelligence	Slovenia
11	University of Sousse	Tunisia
12	Notre Dame University	Lebanon
13	University of Cape Town	South Africa
14	University of South Africa	South Africa
15	OER Foundation	New Zealand
16	Te Pūkenga	New Zealand

Unsere Netzwerke

Netzwerk "Ethische KI-Nutzung"

Deutsche Community seit März 2023

https://ethischeki.ecompetence.eu



Network "Ethical use of AI"

European Community for Ethical AI&ED

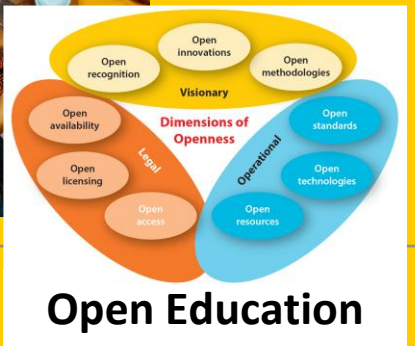
https://ethicalai.ecompetence.eu

Meine zentralen Hypothesen

1. **Künstliche Intelligenz verändert mehr als COVID-19 und alle digitalen Tools**

2. **Künstliche Intelligenz muss weltweit reguliert werden: Die Zeit läuft ...**

3. **Bildung und KI müssen stärker Ethik, Demokratie und Gesellschaft fokussieren**



Open Education

https://opening-up.education/artificial-intelligence-and-education

Before We End

Was ist Ihre Position?

https://www.menti.com

Code: 3338 7952

Ethische KI-Nutzung ist für mich ...

-5 (sehr unwichtig) **+5 (sehr wichtig)**

Was ist Ihre Position?

https://www.menti.com

Code: 3338 7952

KI wird die (Hochschul-) Bildung ...

-5 (stark verschlechtern) **+5 (stark verbessern)**

Was ist Ihre Position?

https://www.menti.com

Code: 3338 7952

Mit ethischer KI-Nutzung kenne ich mich aus ...

1 (gar nicht) **10 (sehr gut)**

AI and Education

Interested? Contact me!

Dr. Christian M. Stracke
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www.hrz.uni-bonn.de
www.opening-up.education

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and many more, all are openly and freely available at: http://www.opening-up.education

Let us cooperate!

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Thank you for your attention!

Interested? What are your questions?

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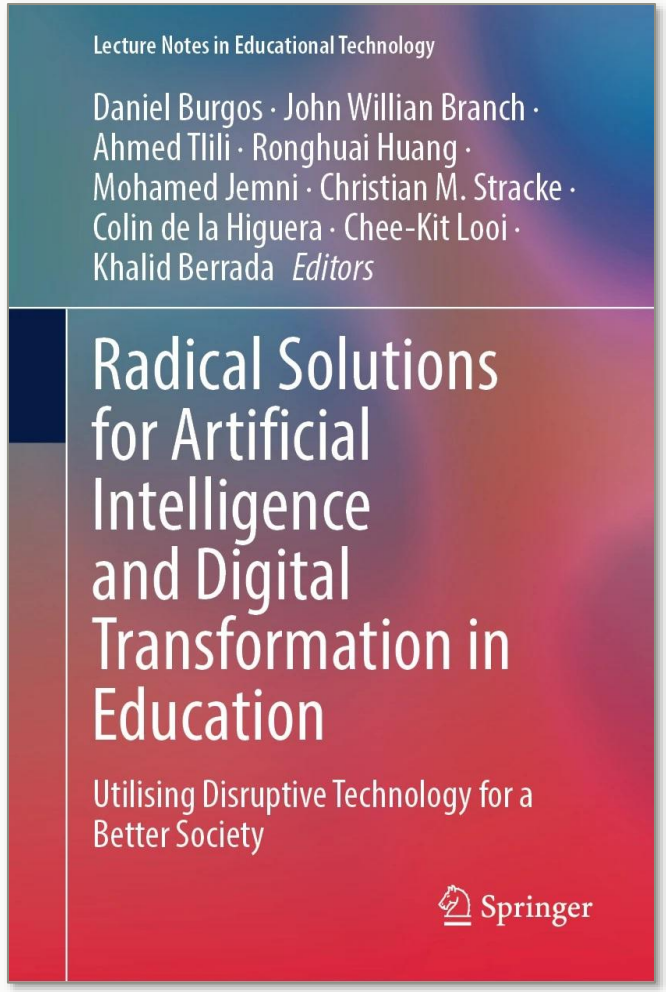
Literaturempfehlungen

Ethische AI&ED & Menschenrechte



AI&ED zur Stärkung der Gesellschaft: "Artificial Intelligence and Education: Ethical Questions and Guidelines for Their Relations Based on Human Rights, Democracy and the Rule of Law" (Dezember 2024)

https://doi.org/10.1007/978-981-97-8638-1_7

Systematic Literature Review (SLR)

Global trends in scientific debates on trustworthy and ethical Artificial Intelligence and Education

Christian M. Stracke [1] [0000-0001-9656-8298], Irene-Angelica Chounta [2] [0000-0001-9159-0664], and Wayne Homes [3] [0000-0002-6350-1994]

[1] University of Bonn, Germany, [2] University of Duisburg-Essen, Germany, [3] University College London, UK
stracke@uni-bonn.de, irene-angelica.chounta@uni-due.de, wayne.holmes@ucl.ac.uk

Abstract. This paper presents a systematic review of the scientific literature on trustworthy and ethical Artificial Intelligence (AI) and Education (AI&ED), including both AI *applied* in education to support teaching and learning (AIED), as well as education *about* AI (AI literacy). Key interest is the identification of global trends with a special focus on unbalanced disparities. Strictly following the standardised protocol and the underlying PRISMA approach, 324 records were identified and selected according to the pre-defined protocol for the systematic review. Finally, 62 articles were included in the quantitative and qualitative analysis in response to four research questions: Which (i) journals, (ii) disciplines, and (iii) regions are leading scientific debates and sustainable developments in education and trustworthy/ethical AI, and (iv) what are the past trends? The articles revealed an unbalanced distribution across the various dimensions, together with an exponential growth over recent years. Building upon our analysis, we argue for an increase in interdisciplinary research that shifts the focus from the currently dominant technological focus towards a more human-centered (educational and societal) focus. Only through such a development AI can contribute effectively to the UN Sustainable Development Goal no. 4 of a world with equitable and universal access to quality education. The results of our systematic review provide the basis to address and facilitate equality in the future AI&ED progress across regions worldwide.

Keywords: Trustworthy and ethical AI, AI&ED, Web of Science articles, Systematic literature review, Informatics and information technologies, Education and learning sciences, Sustainable digital transformations.

1 Introduction

The concept of Artificial Intelligence (AI) has been controversial since the term was first coined [4, 14, 18]. Nonetheless, AI has been introduced in many disciplines, including – for around fifty years – in education [2, 13, 15, 20, 23]. However, it remains the case that AI in education was mostly researched by computer scientists rather than educators in the beginning [33].

Pre-print of the camera-ready version, recommended citation:
Stracke, C. M., Chounta, I.-A., & Holmes, W. (2024). Global trends in scientific debates on trustworthy and ethical Artificial Intelligence and education. In *Artificial Intelligence in Education. AIED 2024. Communications in Computer and Information Science. Springer*. (accepted, pre-print). https://doi.org/10.5281/zenodo.11518072
[Final official publication: https://doi.org/10.1007/978-3-031-64315-6_21]

SLR on Ethical AI and Education: "Global trends in scientific debates on trustworthy and ethical Artificial Intelligence and Education"

by Stracke, C.M.; Chounta, I.-A. & Holmes, W. (2024) – presented at AIED 2024 in Recife

https://doi.org/10.5281/zenodo.11518072

Systematic Literature Review (SLR)

Vol.6 No.2 (2023)
Journal of Applied Learning & Teaching
ISSN : 2591-801X
Content Available at : http://journals.sfu.ca/jalt/index.php/jalt/index

A standardised PRISMA-based protocol for systematic reviews of the scientific literature on Artificial Intelligence and education (AI&ED)

Christian M. Stracke[A] — A — University of Bonn, Germany
Irene-Angelica Chounta[B] — B — University of Duisburg-Essen, Germany
Wayne Holmes[C] — C — University College of London, UK
Ahmed Tlili[D] — D — Beijing Normal University, China
Aras Bozkurt[E] — E — Anadolu University, Turkey

Keywords
AIED;
AI literacy;
AI&ED;
Artificial Intelligence;
education;
ethical;
learning;
PRISMA;
systematic review;
trustworthy.

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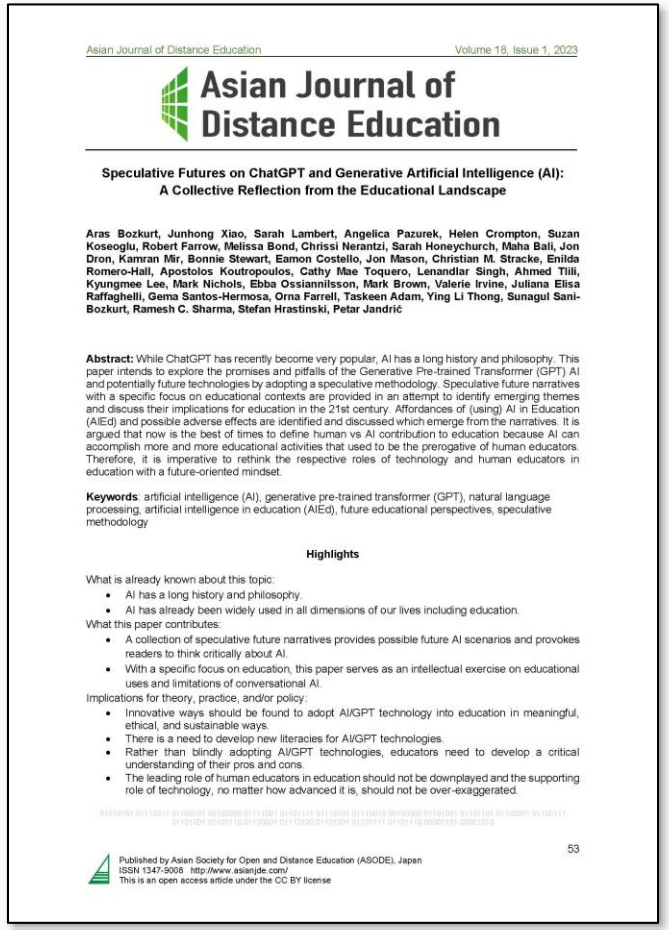
Abstract
By using standardised approaches, systematic reviews of the educational, scientific literature can inform educational research and influence educational policies and practices. However, the various systematic reviews of the scientific literature in the field of Artificial Intelligence (AI) and education all adopt individual approaches, making it challenging to systematically compare their conclusions. Accordingly, this paper presents a standardised protocol for conducting systematic reviews of the scientific literature on AI and education (AI&ED), including both literature on teaching and learning with AI (AIED) and literature on teaching and learning about AI (AI literacy). Our protocol applies the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and is presented here for the purpose of replication and validation. We exemplify our protocol by means of a systematic review of the scientific literature on *trustworthy and ethical AI&ED*, which was undertaken iteratively in symbiosis with the development of the protocol, informing each other throughout. In the future, we intend to apply our novel protocol for other search terms of relevance to AI&ED, as well as for the same search terms over a longer time period, in order to allow comparisons and the exploration of trends.

Standardised PRISMA-based protocol for SLR on AI and Education

by Stracke, C.M.; Chounta, I.-A.; Holmes, W.; Tlili, A. & Bozkurt, A. (2023).

https://doi.org/10.37074/jalt.2023.6.2.38

Ethical AI&ED guidelines



Asian Journal of Distance Education Volume 18, Issue 1, 2023

Asian Journal of Distance Education

Speculative Futures on ChatGPT and Generative Artificial Intelligence (AI): A Collective Reflection from the Educational Landscape

Aras Bozkurt, Junhong Xiao, Sarah Lambert, Angelica Pazurek, Helen Crompton, Suzan Koseoglu, Robert Farrow, Melissa Bond, Chrissi Nerantzi, Sarah Honeychurch, Maha Bali, Jon Dron, Kamran Mir, Bonnie Stewart, Eamon Costello, Jon Mason, Christian M. Stracke, Enilda Romero-Hall, Apostolos Koutropoulos, Cathy Mae Toquero, Lenandlar Singh, Ahmed Tlili, Kyungmee Lee, Mark Nichols, Ebba Ossiannilsson, Mark Brown, Valerie Irvine, Juliana Elisa Raffaghelli, Gema Santos-Hermosa, Orna Farrell, Taskeen Adam, Ying Li Thong, Sunagul Sani-Bozkurt, Ramesh C. Sharma, Stefan Hrastinski, Petar Jandrić

Abstract: While ChatGPT has recently become very popular, AI has a long history and philosophy. This paper intends to explore the promises and pitfalls of the Generative Pre-trained Transformer (GPT) AI and potentially future technologies by adopting a speculative methodology. Speculative future narratives with a specific focus on educational contexts are provided in an attempt to identify emerging themes and discuss their implications for education in the 21st century. Affordances of (using) AI in Education (AIEd) and possible adverse effects are identified and discussed which emerge from the narratives. It is argued that now is the best of times to define human vs AI contribution to education because AI can accomplish more and more educational activities that used to be the prerogative of human educators. Therefore, it is imperative to rethink the respective roles of technology and human educators in education with a future-oriented mindset.

Keywords: artificial intelligence (AI), generative pre-trained transformer (GPT), natural language processing, artificial intelligence in education (AIEd), future educational perspectives, speculative methodology

Highlights

What is already known about this topic:

- AI has a long history and philosophy.
- AI has already been widely used in all dimensions of our lives including education.

What this paper contributes:

- A collection of speculative future narratives provides possible future AI scenarios and provokes readers to think critically about AI.
- With a specific focus on education, this paper serves as an intellectual exercise on educational uses and limitations of conversational AI.

Implications for theory, practice, and/or policy:

- Innovative ways should be found to adopt AI/GPT technology into education in meaningful, ethical, and sustainable ways.
- There is a need to develop new literacies for AI/GPT technologies.
- Rather than blindly adopting AI/GPT technologies, educators need to develop a critical understanding of their pros and cons.
- The leading role of human educators in education should not be downplayed and the supporting role of technology, no matter how advanced it is, should not be over-exaggerated.

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Speculative Futures on ChatGPT and Generative Artificial Intelligence (AI):

Speculative Future Narratives through Fictional Storytelling: Positive and negative AI&ED futures

Bozkurt, A., Stracke, C.M. et al. (2023). Speculative Futures on ChatGPT and Generative Artificial Intelligence (AI): A Collective Reflection from the Educational Landscape. https://www.asianjde.com/ojs/index.php/AsianJDE/article/view/709/394

Ethical AI&ED guidelines

Journal of Learning for Development 11(3), 2024, 398-413.

Taming the Monster: How can Open Education Promote the Effective and Safe use of Generative AI in Education?

Ahmed Tlili[1], Michael Agyemang Adarkwah[2], Chung Kwan Lo[3], Aras Bozkurt[4], Daniel Burgos[5,6], Curtis J. Bonk[7], Eamon Costello[8], Sanjaya Mishra[9], Christian M. Stracke[10] and Ronghuai Huang[1]

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Keywords: Open Education (OE), Open Educational Resources (OER), Open Educational Practices (OEP), Generative AI (GenAI), Large Language Models (LLM), ChatGPT learning, SMS

Abstract

The development, use, and timely promotion of Open Education (OE) has been effective in addressing myriad educational concerns, including inclusivity, accessibility and learning achievement, among many others. However, limited information exists in the literature concerning how OE could enhance Generative Artificial Intelligence (GenAI), which is receiving extensive interest and criticism at this time. To address this research gap, this study relies on the Open Educational Practices (OEP) framework of Huang et al. (2020) to provide various OEP scenarios that could help to promote and facilitate the effective and safe adoption of GenAI in education. The findings of this study could provide guidelines on how relying on OEP when adopting GenAI could help in ensuring quality education which is the sustainable development goal (SDG 4) of the United Nations (UN).

Introduction

The term "AI Monsters", coined by Zipf et al. (2024, p. 284), symbolises the fears that the benefits of Generative Artificial Intelligence (GenAI) could come at too high a cost. These concerns include the potential for misuse of GenAI as well as the potential spread of incorrect information (Zhou et al., 2023), problematic threats to academic integrity (Perkins, 2023), difficulties in verifying the authenticity of student work (Ifelebuegu, 2023), and the inherent risk

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Taming the monster: How can open education promote the effective and safe use of generative AI in education?

Contrary approach to AIED

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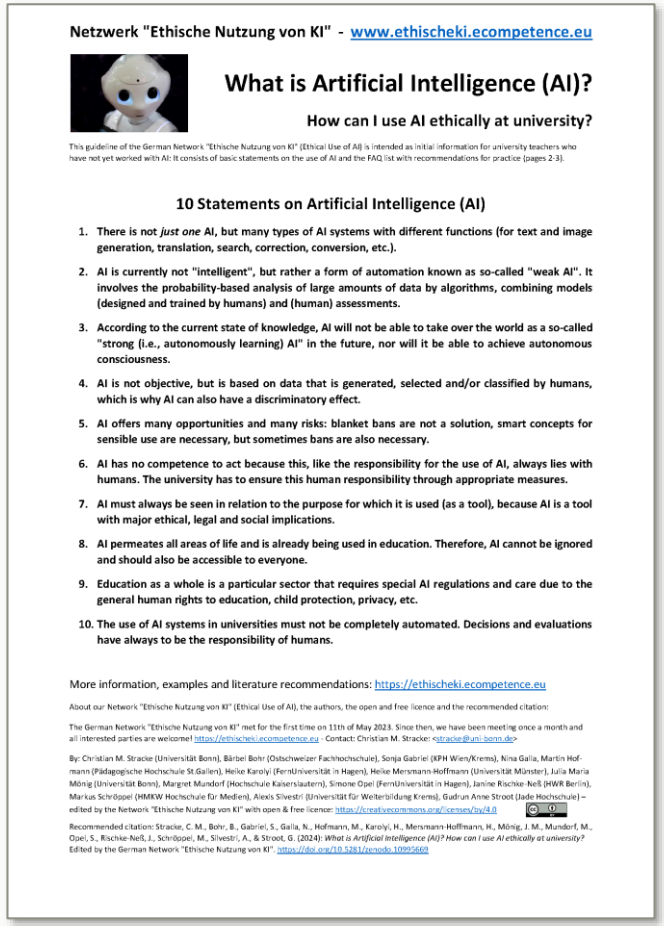
Ethical AI&ED guidelines



Netzwerk "Ethische Nutzung von KI" - www.ethischeki.ecompetence.eu

What is Artificial Intelligence (AI)?

How can I use AI ethically at university?

This guideline of the German Network "Ethische Nutzung von KI" (Ethical Use of AI) is intended as initial information for university teachers who have not yet worked with AI: It consists of basic statements on the use of AI and the FAQ list with recommendations for practice (pages 2-3).

10 Statements on Artificial Intelligence (AI)

1. There is not *just one* AI, but many types of AI systems with different functions (for text and image generation, translation, search, correction, conversion, etc.).
2. AI is currently not "intelligent", but rather a form of automation known as so-called "weak AI". It involves the probability-based analysis of large amounts of data by algorithms, combining models (designed and trained by humans) and (human) assessments.
3. According to the current state of knowledge, AI will not be able to take over the world as a so-called "strong (i.e., autonomously learning) AI" in the future, nor will it be able to achieve autonomous consciousness.
4. AI is not objective, but is based on data that is generated, selected and/or classified by humans, which is why AI can also have a discriminatory effect.
5. AI offers many opportunities and many risks: blanket bans are not a solution, smart concepts for sensible use are necessary, but sometimes bans are also necessary.
6. AI has no competence to act because this, like the responsibility for the use of AI, always lies with humans. The university has to ensure this human responsibility through appropriate measures.
7. AI must always be seen in relation to the purpose for which it is used (as a tool), because AI is a tool with major ethical, legal and social implications.
8. AI permeates all areas of life and is already being used in education. Therefore, AI cannot be ignored and should also be accessible to everyone.
9. Education as a whole is a particular sector that requires special AI regulations and care due to the general human rights to education, child protection, privacy, etc.
10. The use of AI systems in universities must not be completely automated. Decisions and evaluations have always to be the responsibility of humans.

More information, examples and literature recommendations: https://ethischeki.ecompetence.eu

About our Network "Ethische Nutzung von KI" (Ethical Use of AI), the authors, the open and free licence and the recommended citation:

The German Network "Ethische Nutzung von KI" met for the first time on 11th of May 2023. Since then, we have been meeting once a month and all interested parties are welcome! https://ethischeki.ecompetence.eu - Contact: Christian M. Stracke: <stracke@uni-bonn.de>

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Human rights, democracy, rule of law
Commercial monopolism

Ethical use of AI

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Educational AI scenarios

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Ethische AI&ED & Menschenrechte

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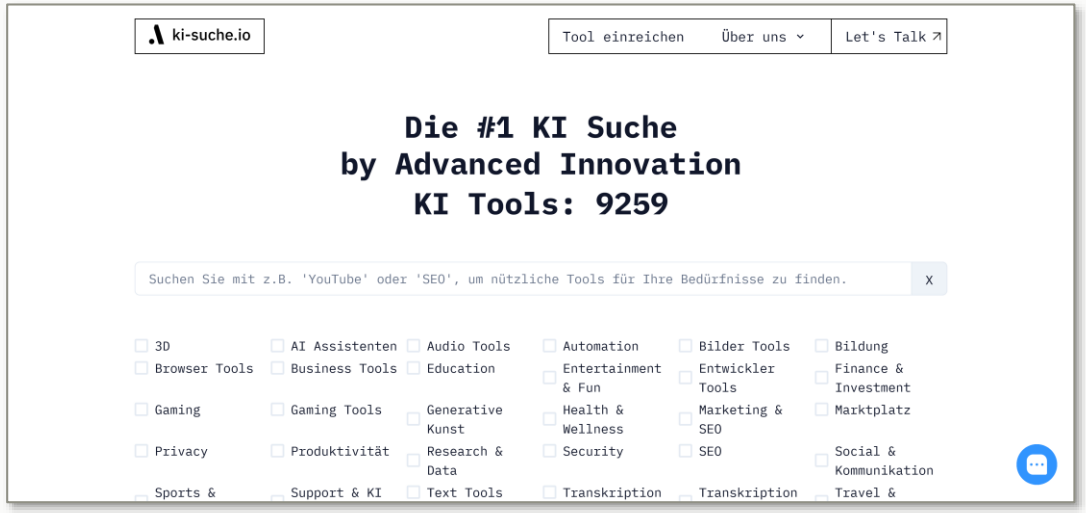
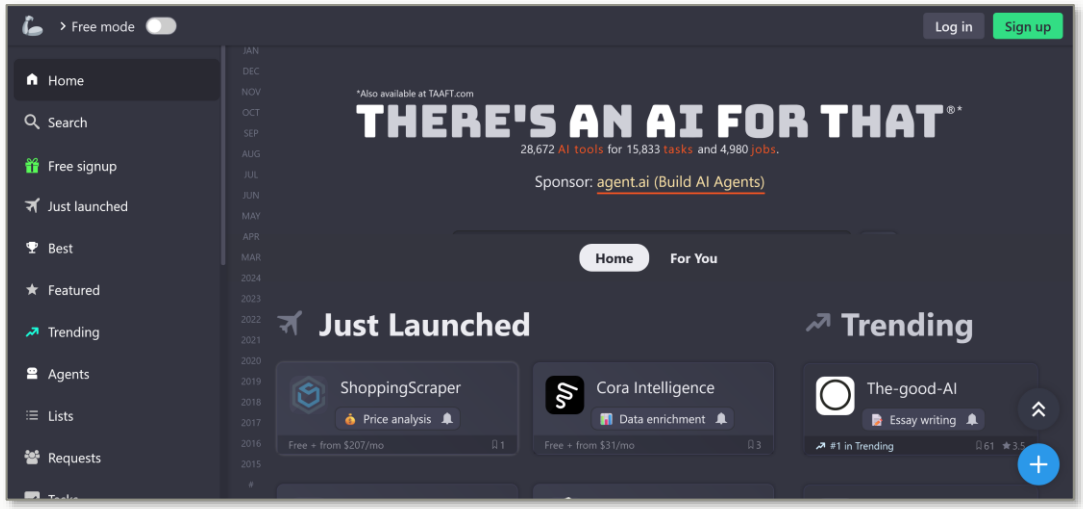
Tools-Sammlungen

Tools-Sammlungen





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Ethical AI and Open Education

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