Exploring the Methodological Contexts and Constraints of Research in Artificial Intelligence in Education

Irene-Angelica Chounta, Bibeg Limbu, Lisa van der Heyden
University of Duisburg-Essen



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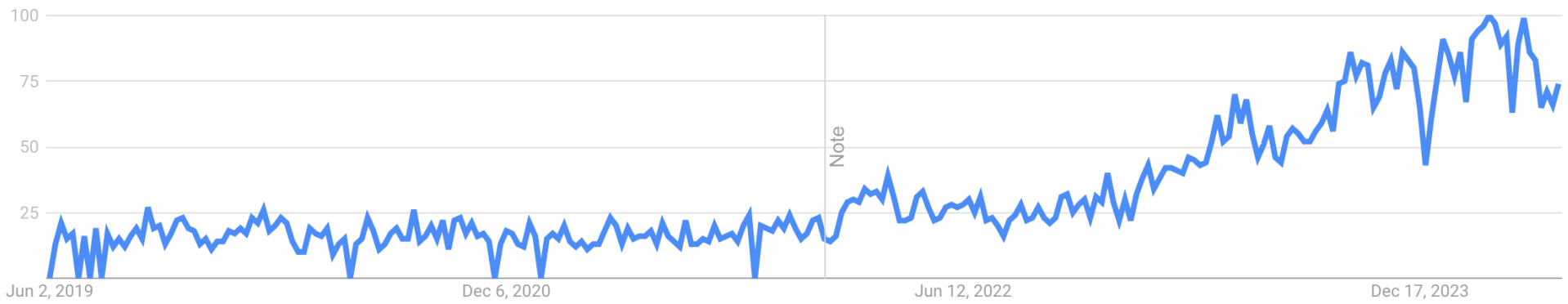
Artificial Intelligence in Education (AIED)

Artificial Intelligence in Education
Search term

+ Compare

Worldwide | Past 5 years | All categories | Web Search

Interest over time



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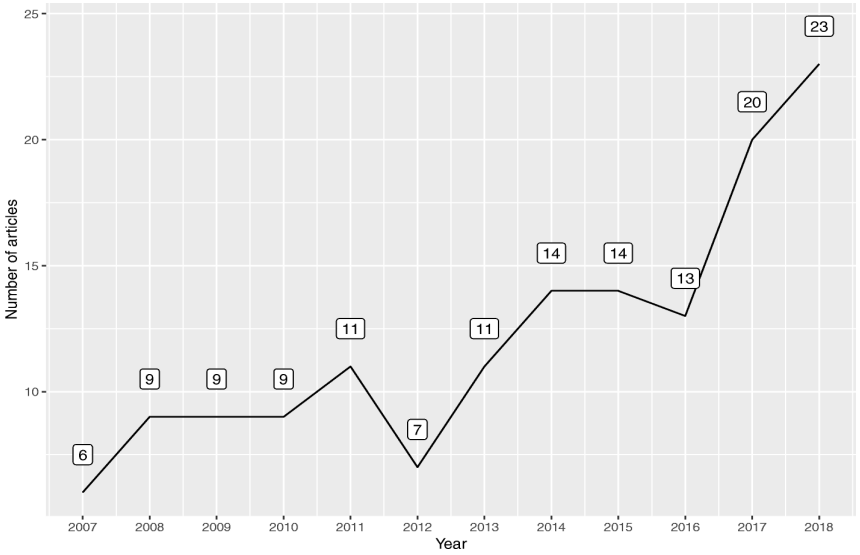
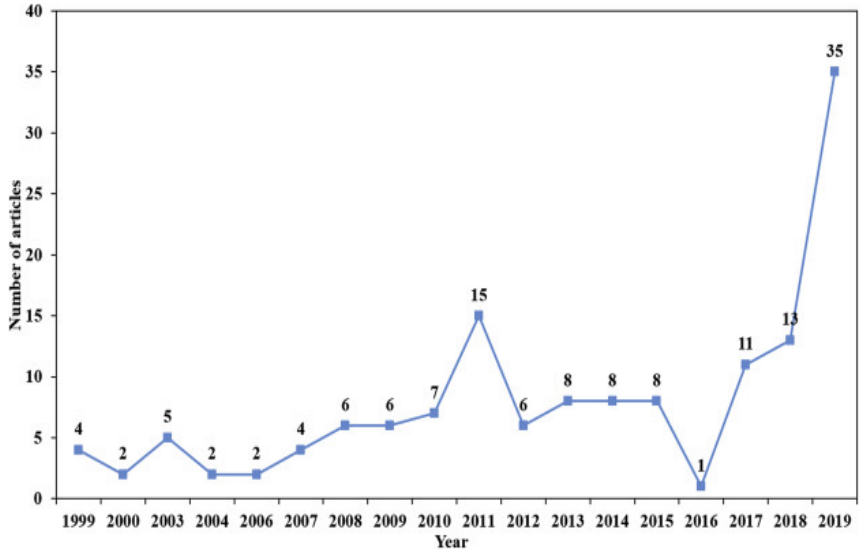
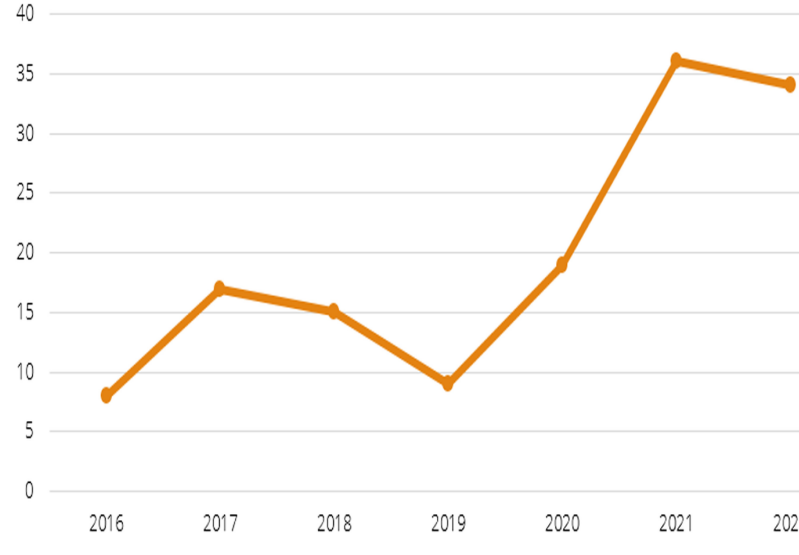
AIED Research



Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education–where are the educators?. International Journal of Educational Technology in Higher Education, 16(1), 1-27.

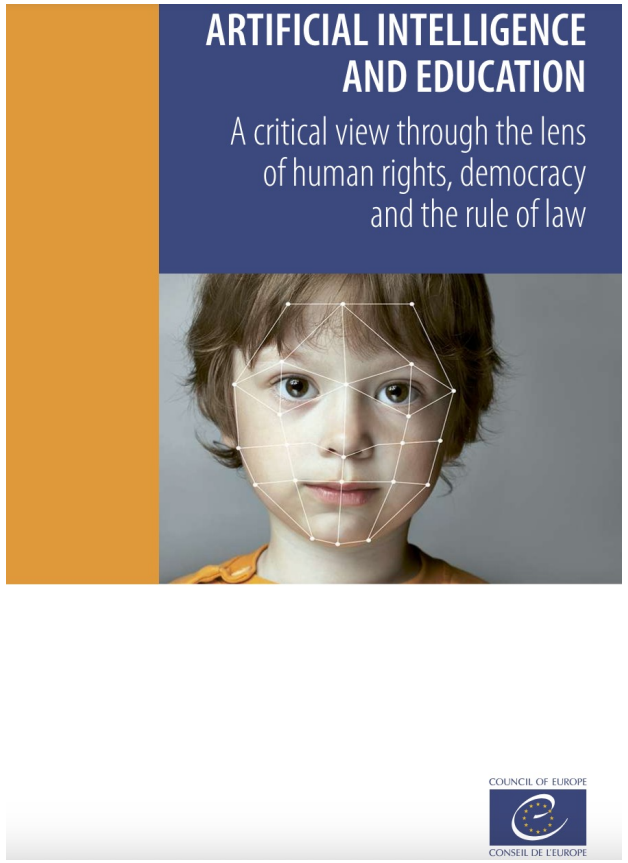


Chen, X., Xie, H., Zou, D., & Hwang, G. J. (2020). Application and theory gaps during the rise of artificial intelligence in education. Computers and Education: Artificial Intelligence, 1, 100002.

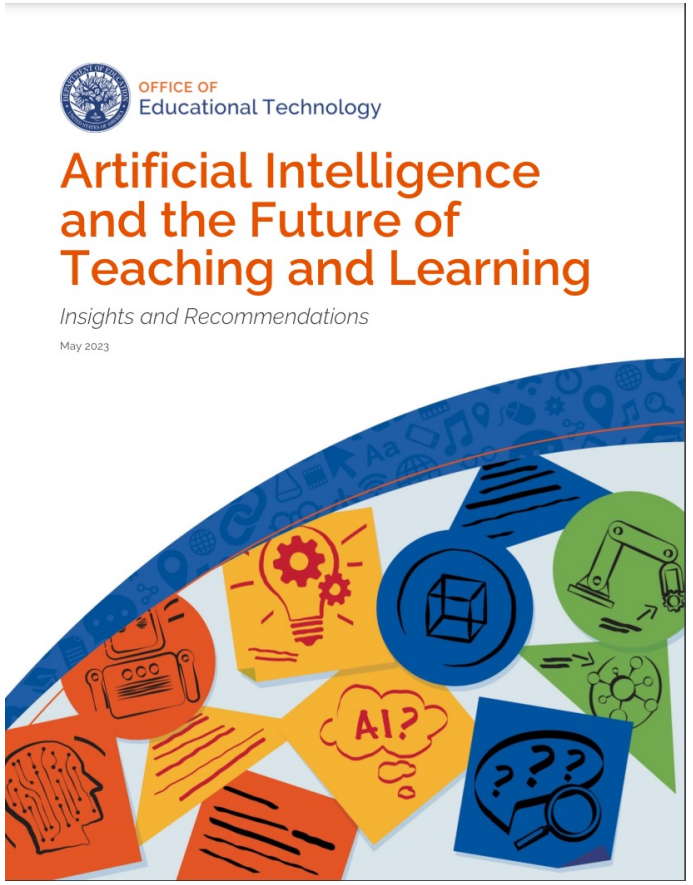


Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: the state of the field. *International Journal of Educational Technology in Higher Education*, *20*(1), 22.

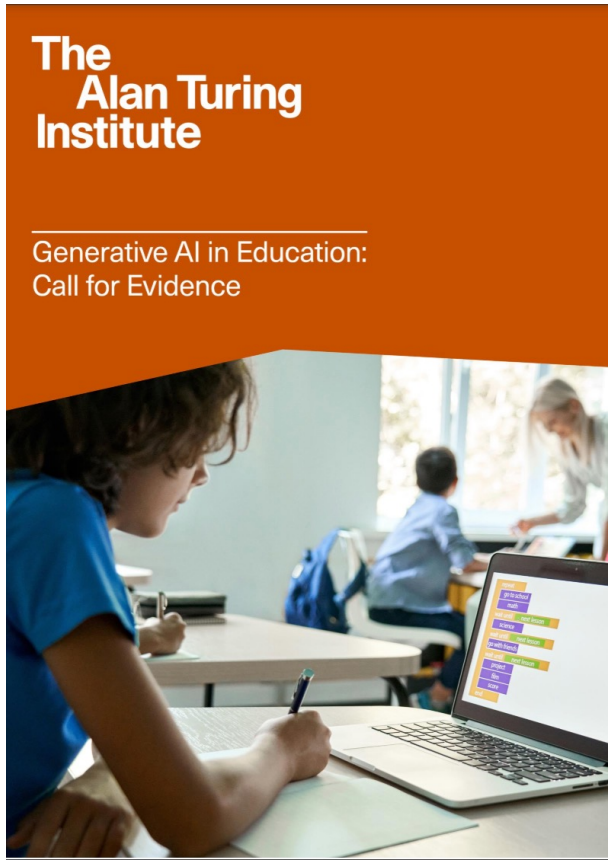
AIED: A Call for Evidence



Holmes, W., Persson, J., Chounta, I. A., Wasson, B., & Dimitrova, V. (2022). Artificial intelligence and education: A critical view through the lens of human rights, democracy and the rule of law. Council of Europe.



U.S. Department of Education, Office of Educational Technology (2023). Artificial Intelligence and
Future of Teaching and Learning: Insights and Recommendations, Washington, DC.



The Alan Turing Institute (2023) "Response to the Government Call for Evidence on Generative AI in Education",

Exploring the research landscape in AIED

SLR Title	Years Covered	#Reviewed Publications
Systematic review of research on artificial intelligence applications in higher education–where are the educators? [20]	2007 - 2018	146
Application and theory gaps during the rise of artificial intelligence in education [3]	1999 -2019	45
AI in education: A systematic literature review [16]	2010 - 2019	23
A systematic review of AI role in the educational system based on a proposed conceptual framework [18]	2005 - 2021	51
Artificial intelligence in online higher education: A systematic review of empirical research from 2011 to 2020 [11]	2011 - 2020	32
Affordances and challenges of artificial intelligence in K-12 education: A systematic review [6]	2011 - 2021	169
Artificial intelligence applications in K-12 education: A systematic literature review [19]	2011 - 2021	210
Systematic literature review on opportunities, challenges, and future research recommendations of artificial intelligence in education [4]	2012 - 2021	92
Artificial intelligence in higher education: the state of the field [5]	2016 - 2022	138

Table 1. Existing Systematic Literature Reviews on AIED

RQ1

- AI & Educational Contexts

RQ2

- Methodological Approaches

RQ3

- Algorithms and Tools

Method

Zawacki-Richter *et al. International Journal of Educational Technology in Higher Education* (2019) 16:39
https://doi.org/10.1186/s41239-019-0171-0

International Journal of Educational Technology in Higher Education

REVIEW ARTICLE Open Access

Systematic review of research on artificial intelligence applications in higher education – where are the educators?

Check for updates

Olaf Zawacki-Richter*, Victoria I. Marín, Melissa Bond and Franziska Gouverneur

* Correspondence: olaf.zawacki.richter@uni-oldenburg.de
Faculty of Education and Social Sciences, University of Oldenburg, Ammerländer Heerstr. 138, 26129 Oldenburg, Germany

Abstract

According to various international reports, Artificial Intelligence in Education (AIEd) is one of the currently emerging fields in educational technology. Whilst it has been around for about 30 years, it is still unclear for educators how to make pedagogical advantage of it on a broader scale, and how it can actually impact meaningfully on teaching and learning in higher education. This paper seeks to provide an overview of research on AI applications in higher education through a systematic review. Out of 2656 initially identified publications for the period between 2007 and 2018, 146 articles were included for final synthesis, according to explicit inclusion and exclusion criteria. The descriptive results show that most of the disciplines involved in AIEd papers come from Computer Science and STEM, and that quantitative methods were the most frequently used in empirical studies. The synthesis of results presents four areas of AIEd applications in academic support services, and institutional and administrative services: 1. profiling and prediction, 2. assessment and evaluation, 3. adaptive systems and personalisation, and 4. intelligent tutoring systems. The conclusions reflect on the almost lack of critical reflection of challenges and risks of AIEd, the weak connection to theoretical pedagogical perspectives, and the need for further exploration of ethical and educational approaches in the application of AIEd in higher education.

Keywords: Artificial intelligence, Higher education, Machine learning, Intelligent tutoring systems, Systematic review

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education–where are the educators?. International Journal of Educational Technology in Higher Education, 16(1), 1-27.

a. 2019 - 2023

b. All Education Levels

c. Research Study(ies)

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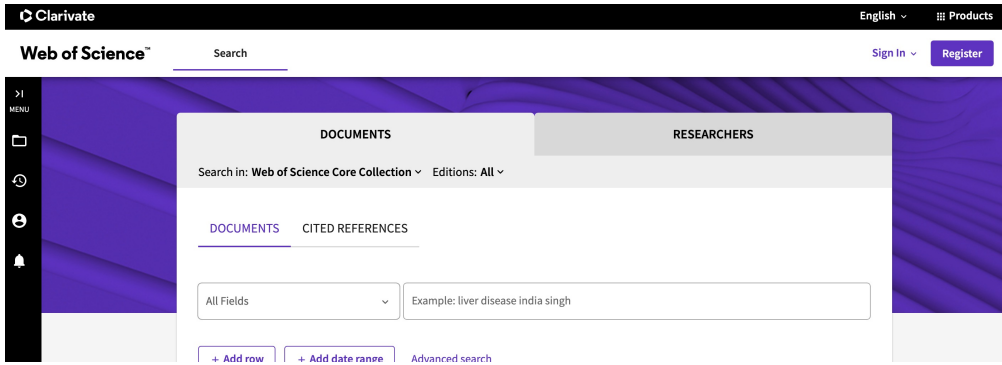

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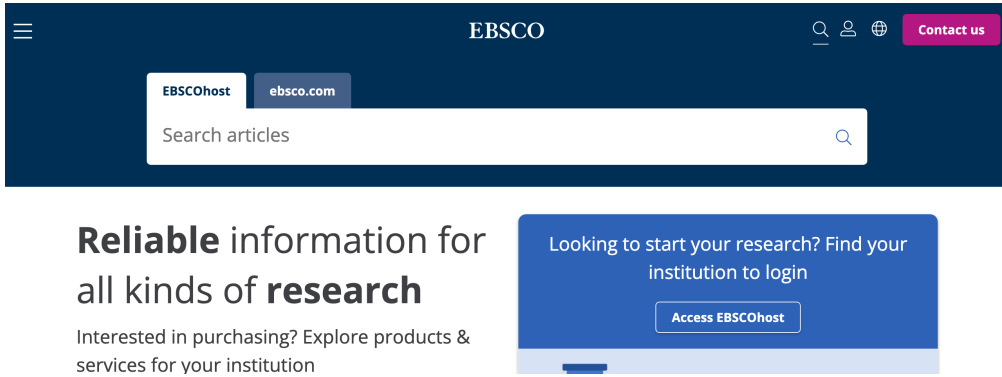

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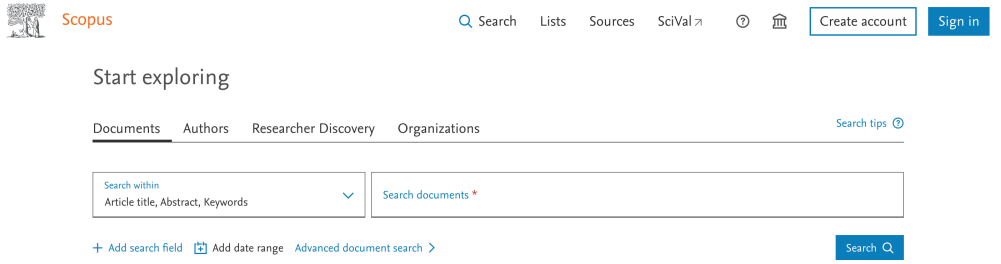

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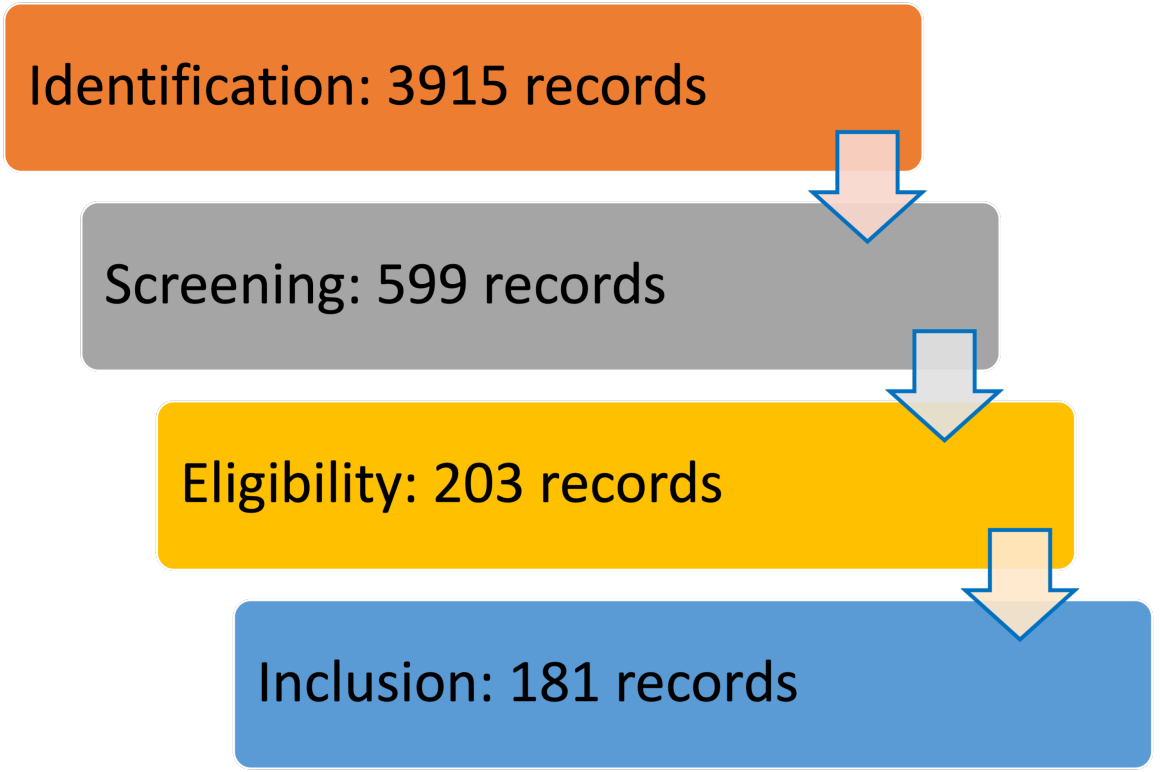
Dataset

Formal Screening	
Exclusion Criteria	**Inclusion Criteria**
The full text of the record is not available.	The full text can be downloaded.
The record is not written in English.	The record is written in English.
The record is not published in a peer-reviewed journal	The record is published in a peer-reviewed journal.
The record is not substantial (< 7 pages).	The record is substantial (>= 7 pages).

Content Screening	
Exclusion Criteria	**Inclusion Criteria**
The record does not address the use of AI.	The record addresses the use of AI.
The record does not address education.	The record addresses education.
The record does not involve a research study	The record involves a research study



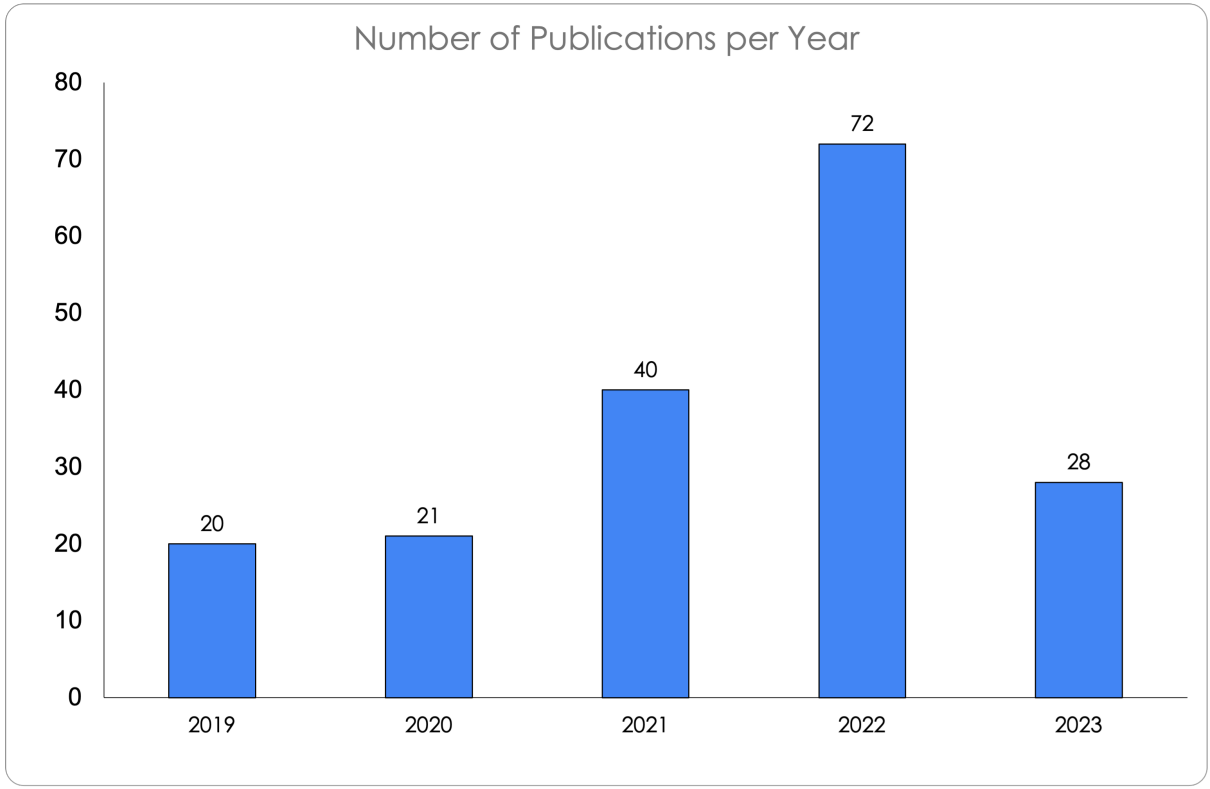
Stracke, C. M., Chounta, I. A., Holmes, W., Tlili, A., & Bozkurt, A. (2023). A standardised PRISMA-based protocol for systematic reviews of the scientific literature on Artificial Intelligence and education (AI&ED). *Journal of Applied Learning and Teaching*, *6*(2), 64-70.

Publications' descriptives

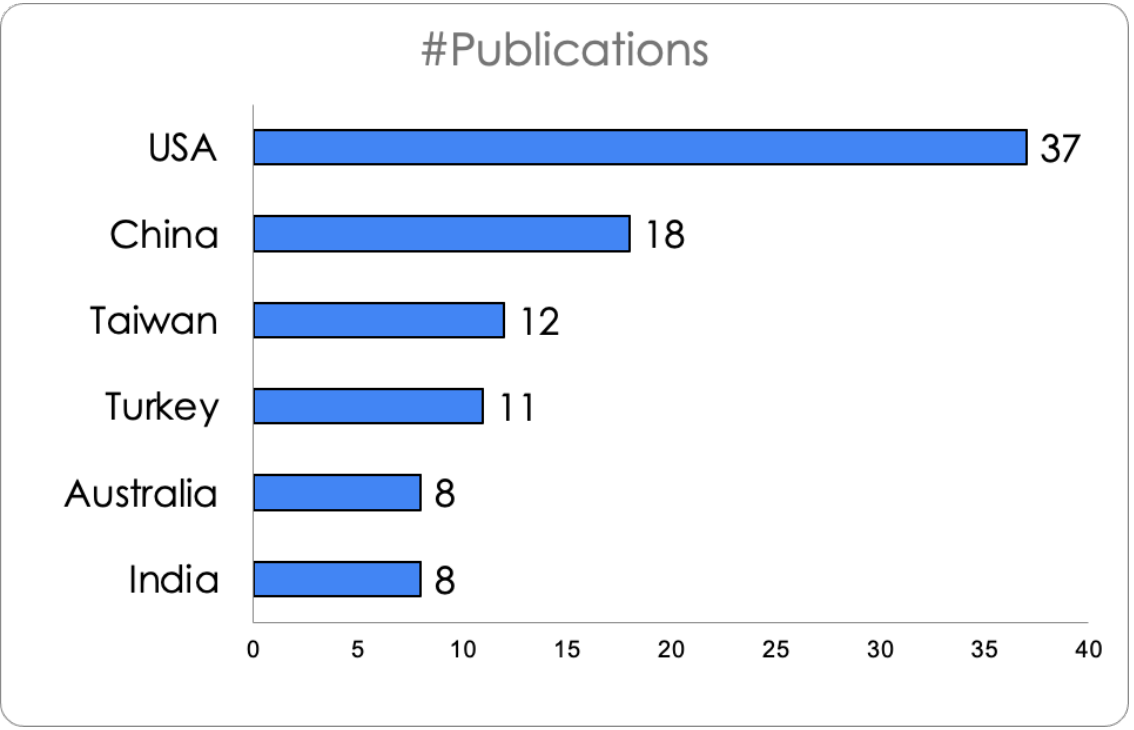
19 publications (11%)

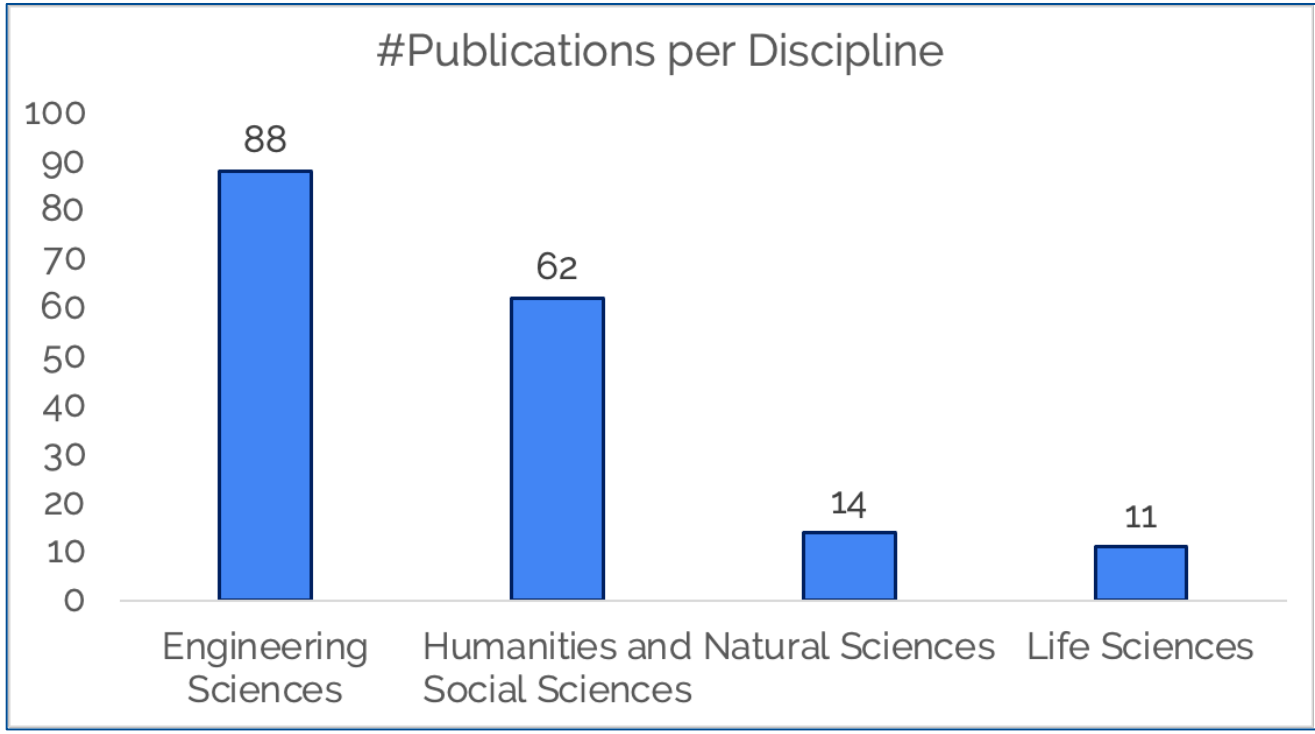
11 publications (6%)

9 publications (5%)

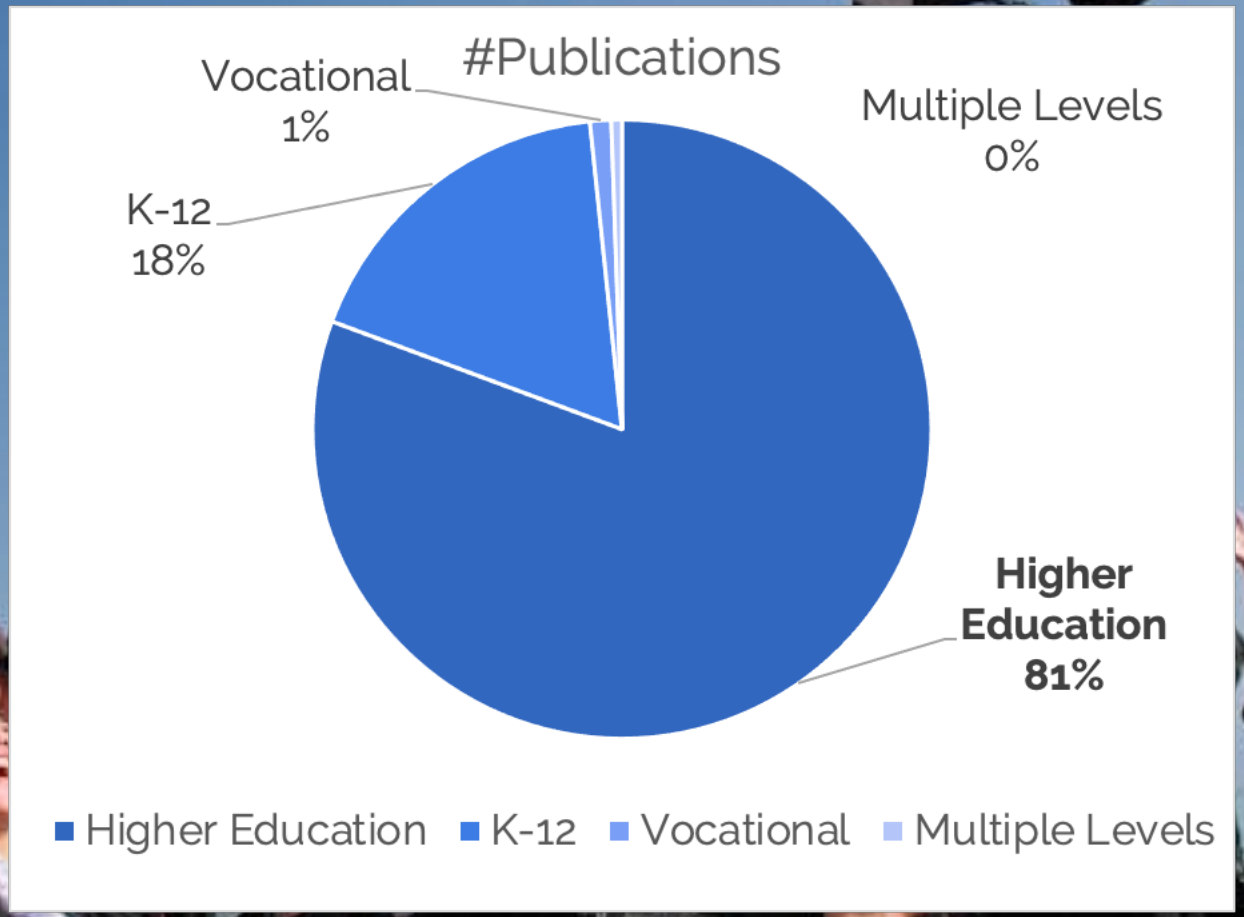


Publications' descriptives

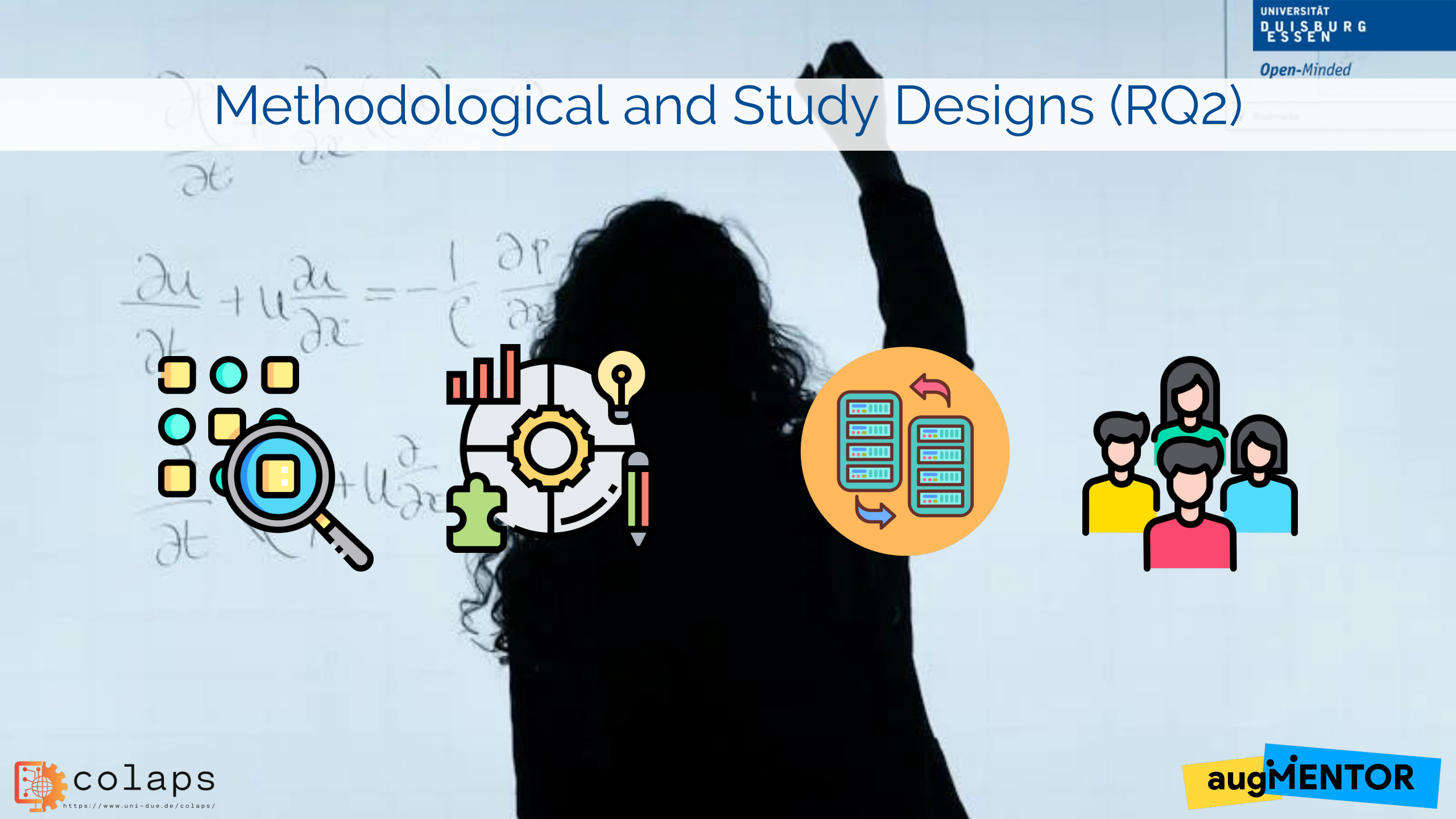




AI and Educational Contexts (RQ1)



Methodological and Study Designs (RQ2)



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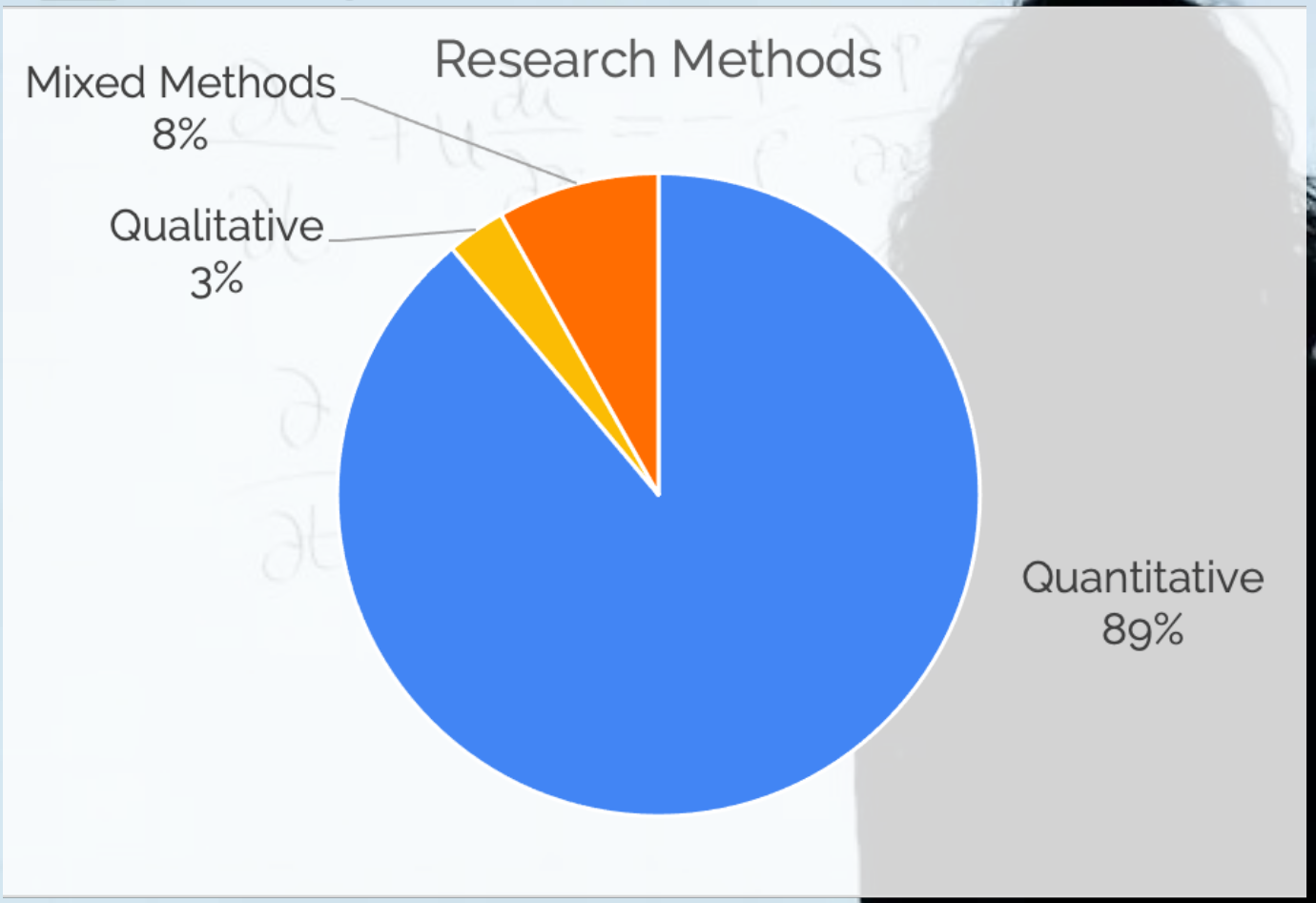
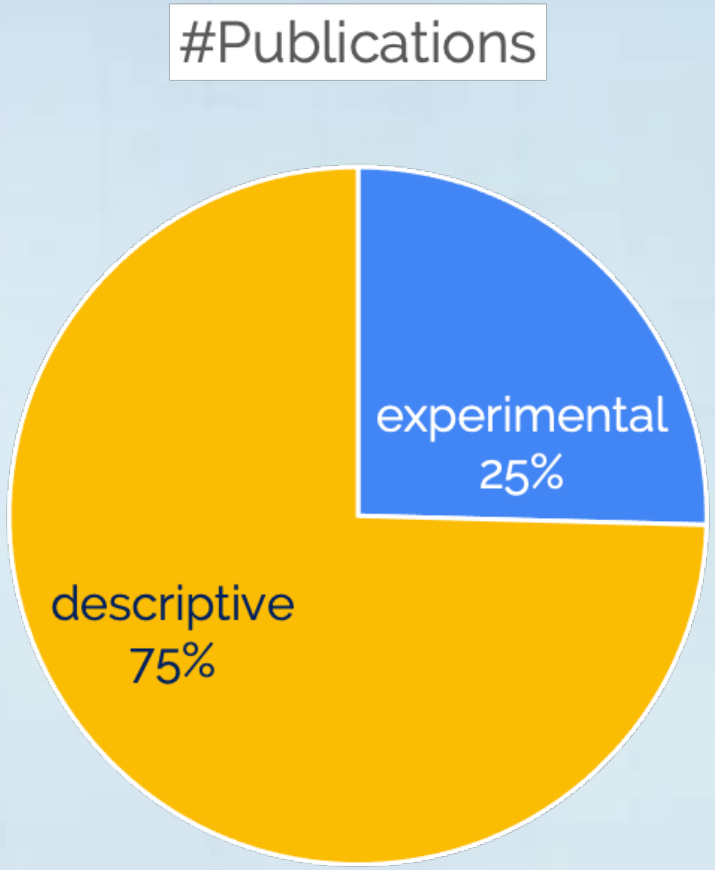
Methodological and Study Designs (RQ2)

Experiment "if researchers introduced an intervention, a test under controlled conditions, and studied the effects"

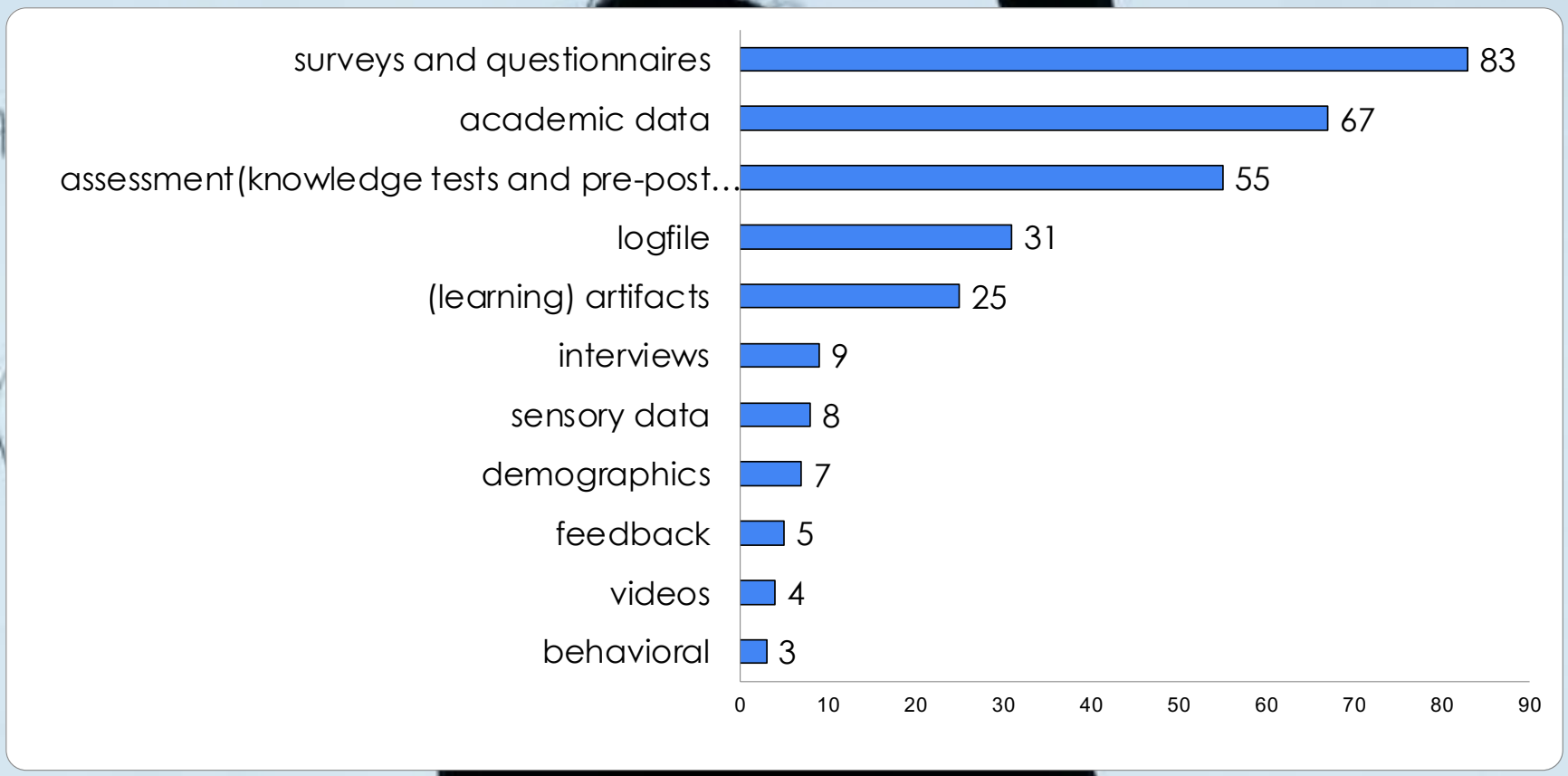
https://dictionary.apa.org/experiment

Methodological and Study Designs (RQ2)

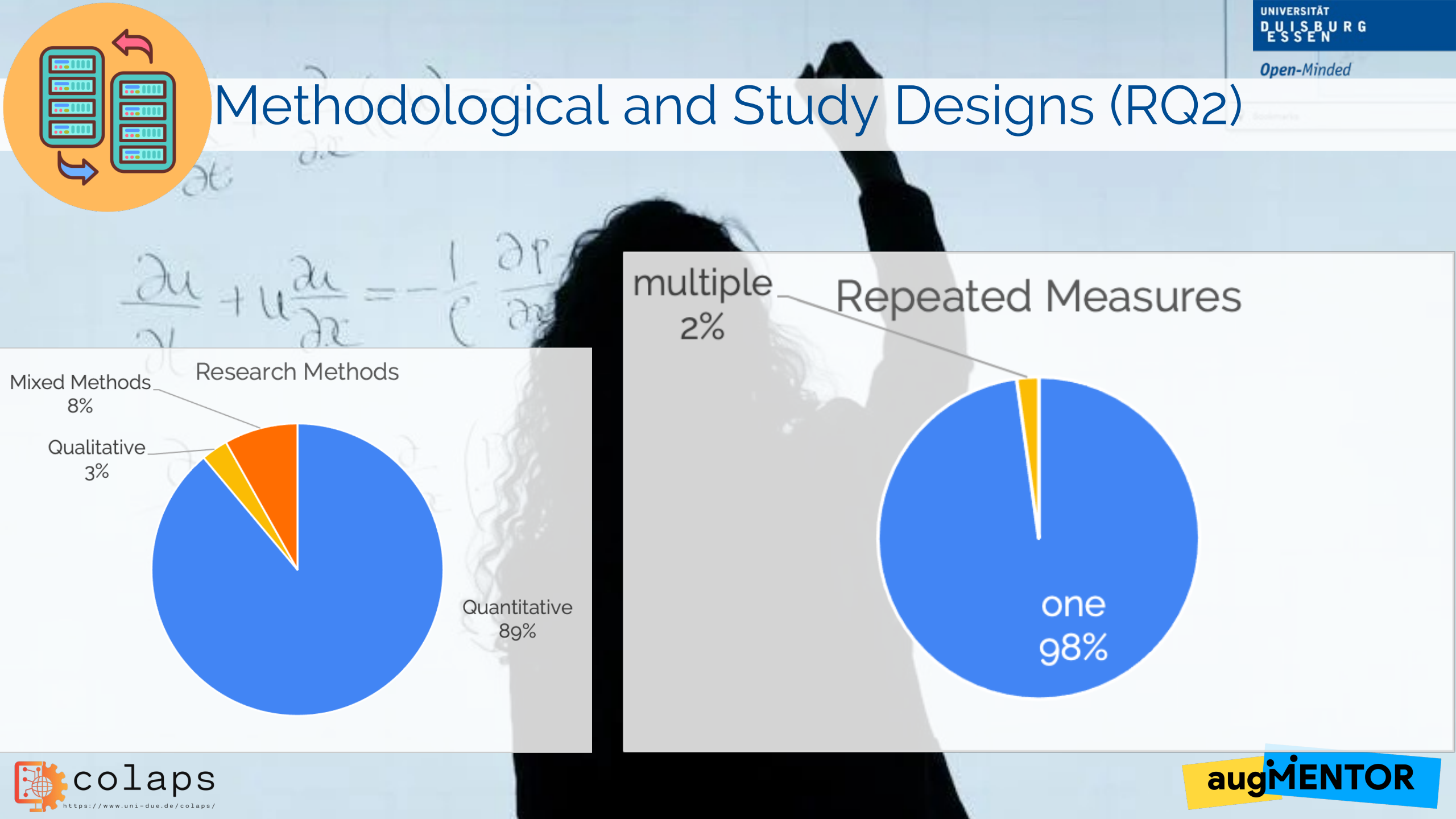




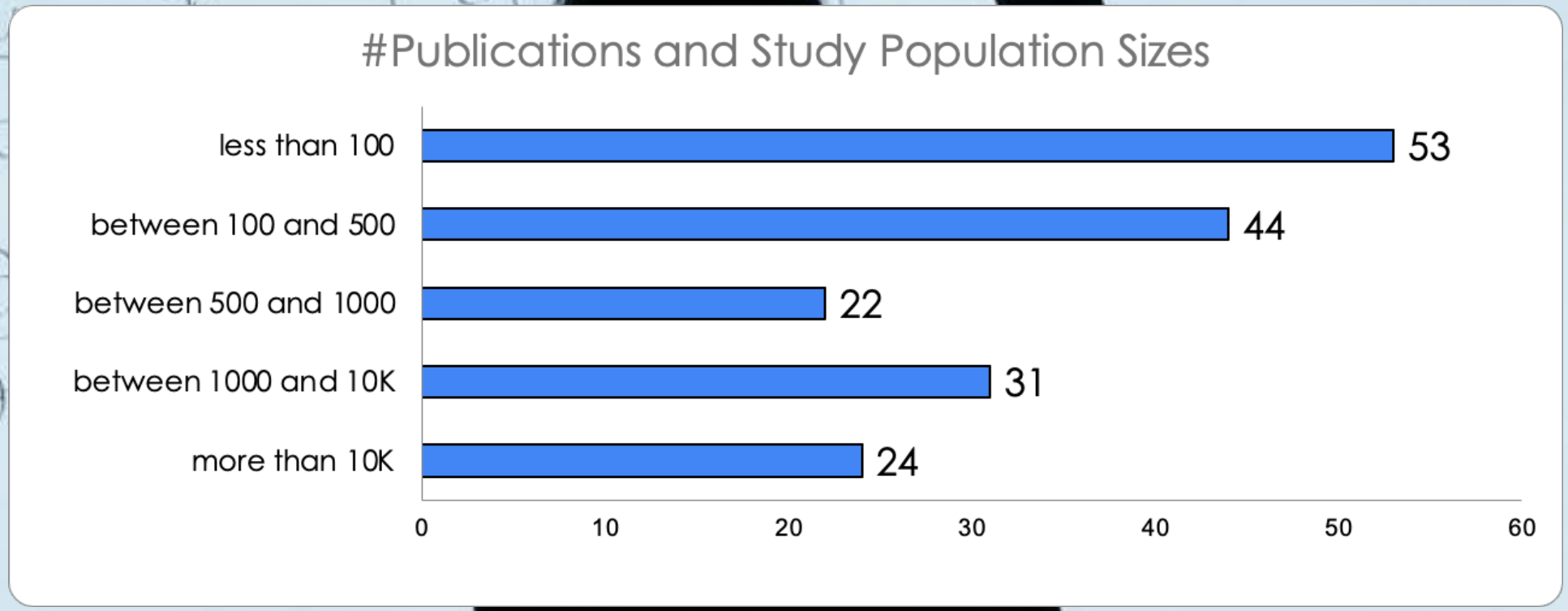
Methodological and Study Designs (RQ2)



Methodological and Study Designs (RQ2)



Methodological and Study Designs (RQ2)



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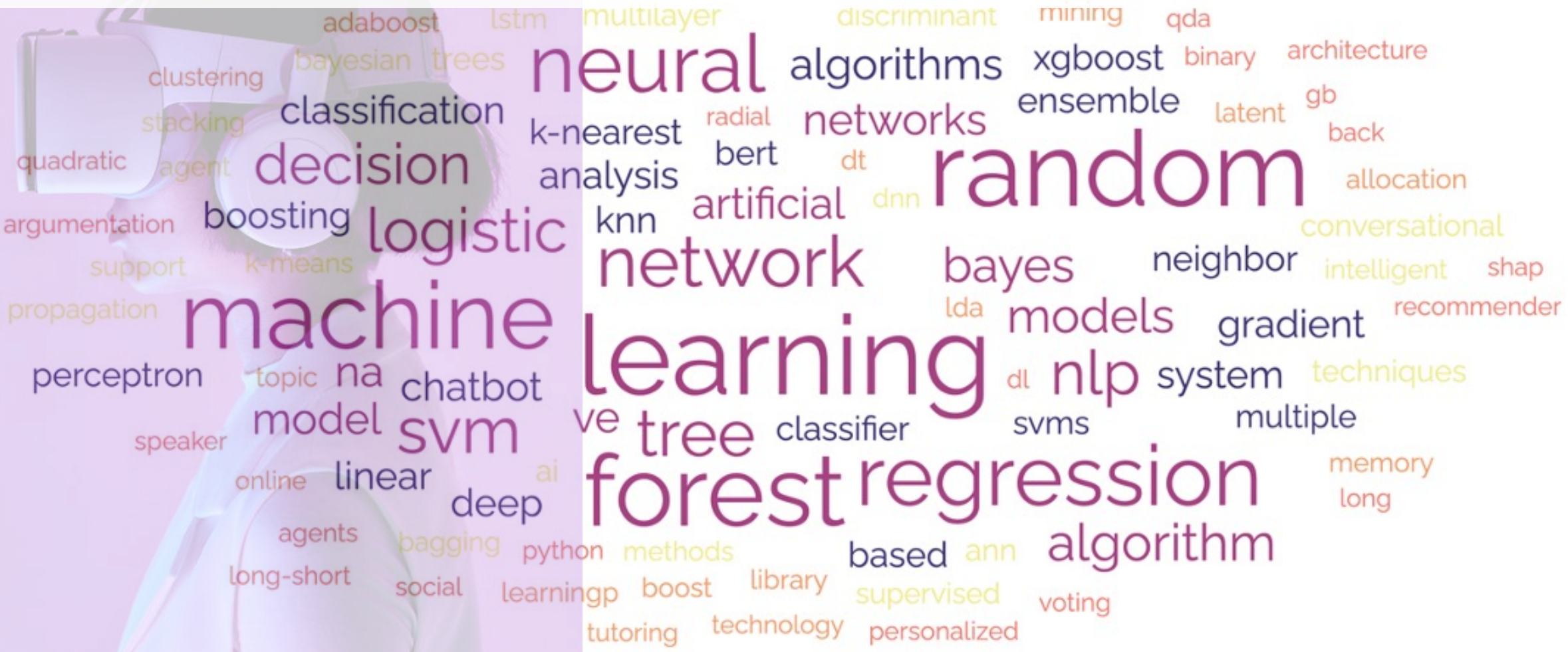
AI Algorithms and Tools (RQ3)



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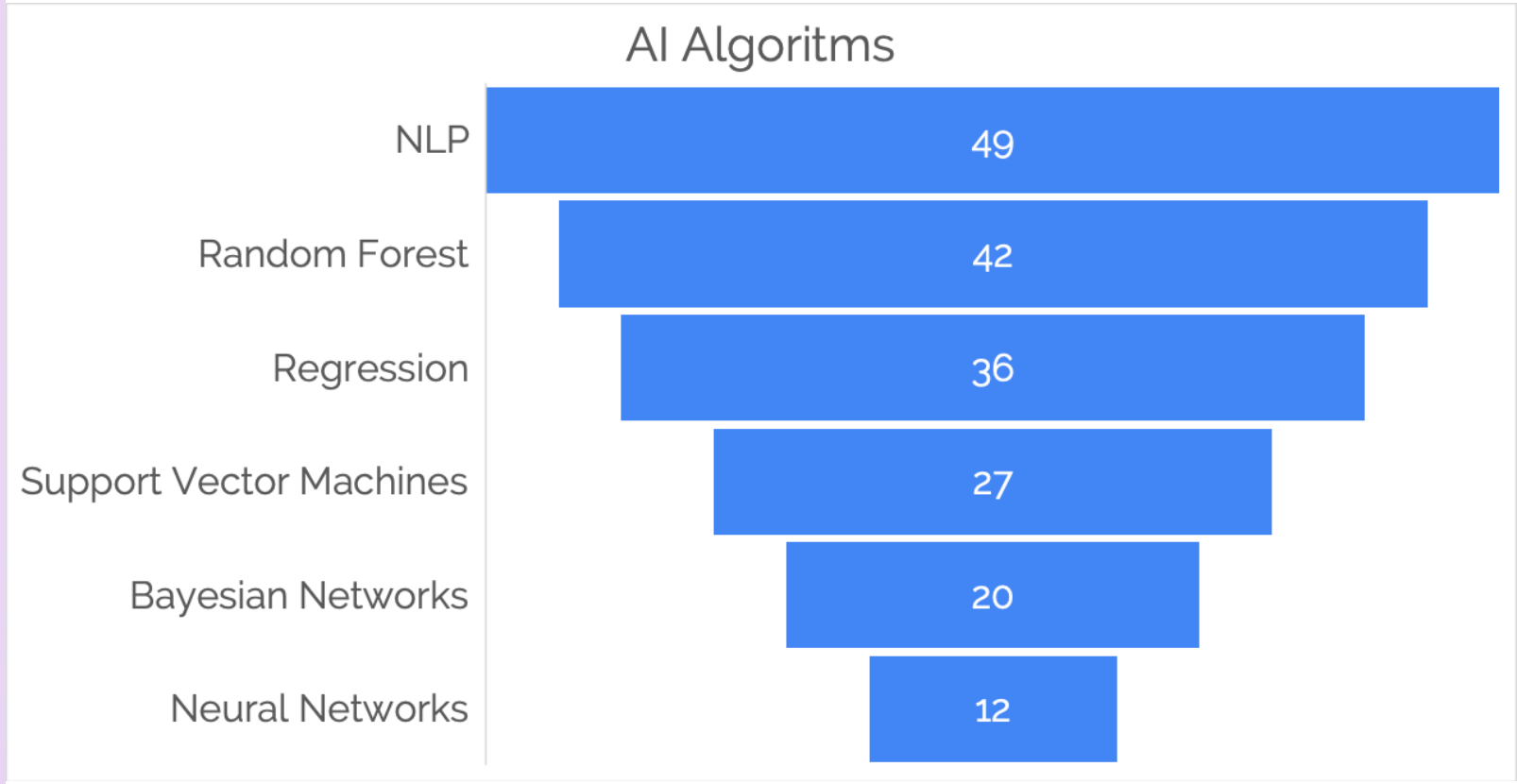
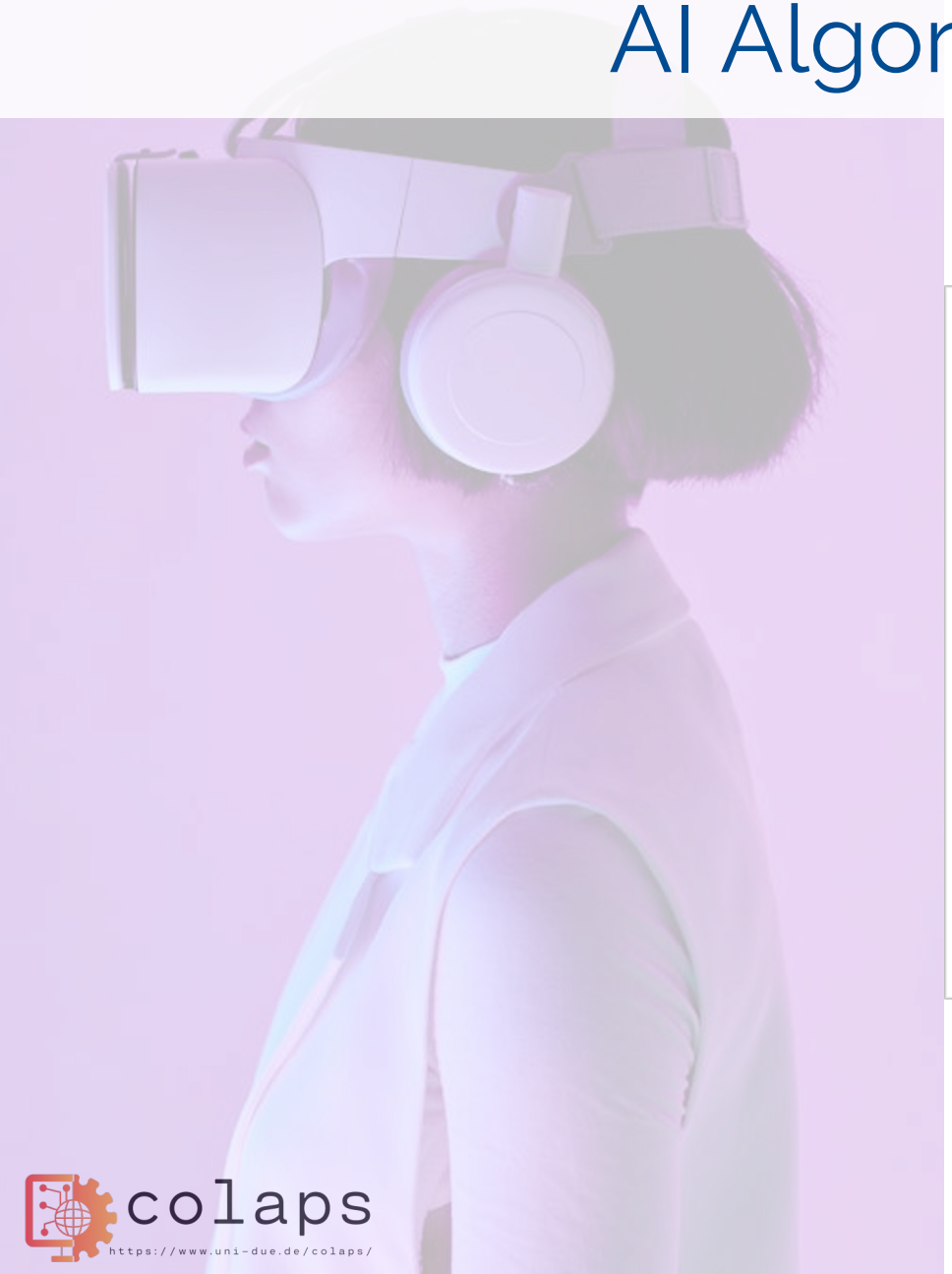
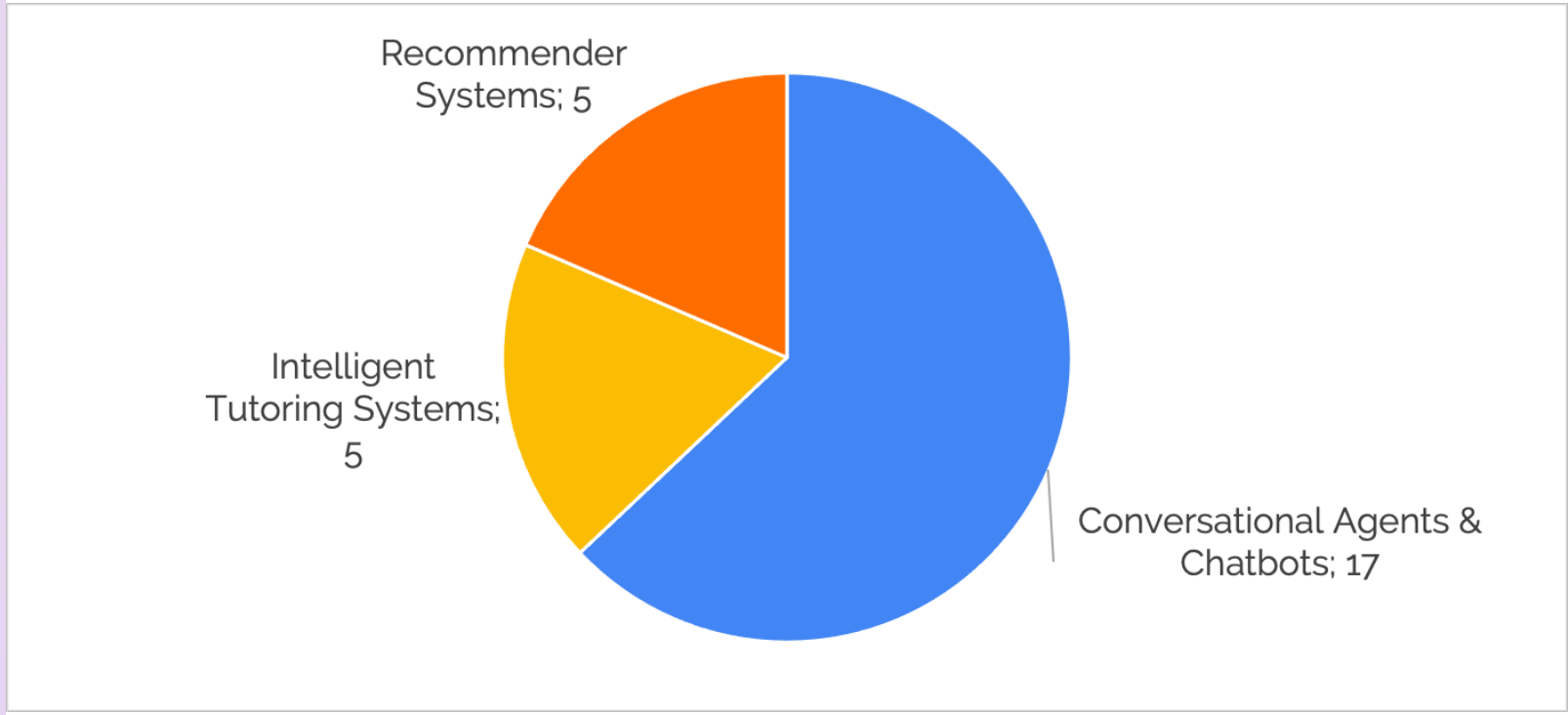
AI Algorithms and Tools (RQ3)



AI Algorithms and Tools (RQ3)





Take Away

Theoretical and Practical Implications

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The augMENTOR project (GA No. 101061509) is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. The European Union cannot be held responsible for them.

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Home Teaching Research Team Blog Impressum

Welcome to the research group "**Computational Methods in Modeling and Analysis of Learning Processes**"

University of Duisburg-Essen

In *colaps* we aim to explore the use of computational data analytics, namely machine-learning and data mining, with the aim to support learning from the perspective of personalization and adaptation and in relation to tutoring feedback and scaffolding.

Our research focuses on data analytics to facilitate learning in formal education and ultimately in modeling, monitoring and guiding complex human activities. Our interests extend to using modern technologies in order to facilitate and promote learning by bridging the gap between theory and modern, data driven, technology-oriented practice: combining top-down, established pedagogical theories with bottom-up, data-driven computational approaches.

Teaching

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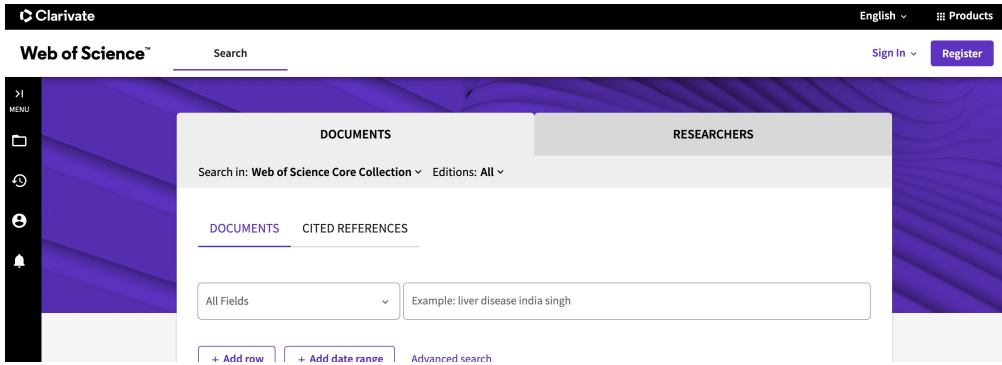
Search Query = (“artificial intelligence” OR “machine intelligence” OR “intelligent support” OR “intelligent virtual reality” OR “chatbot*” OR “machine learning” OR “automated tutor” OR “personal tutor*” OR “intelligent agent*” OR “expert system” OR “neural network” OR “natural language processing”) AND (“higher education” OR college* OR undergrad* OR graduate OR postgrad* OR “K-12” OR kindergarten* OR “corporate training*” OR “professional training*” OR “primary school*” OR “middle school*” OR “high school*” OR “elementary school*” OR “vocational education” OR “adult education”) AND (learn* OR student*)



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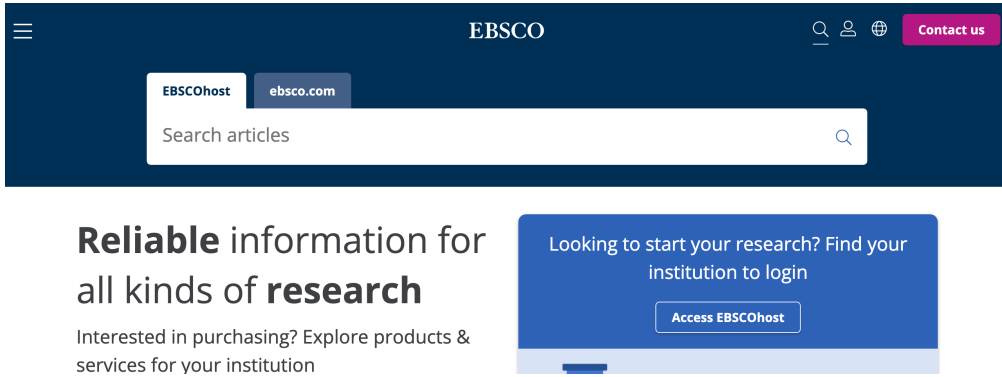

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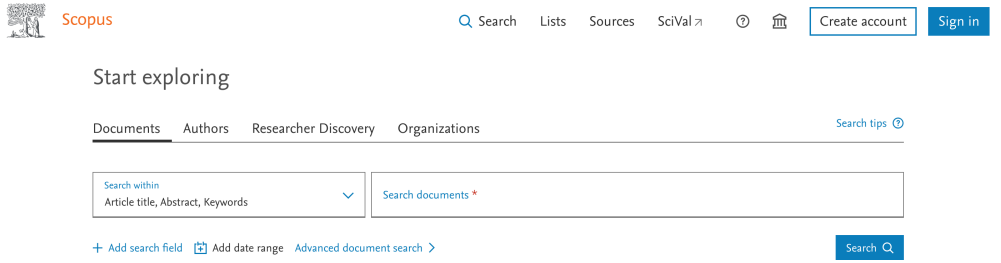

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