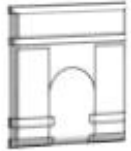


Trained staff on
outcomes and digital oriented
teaching and learning



DECEMBER, 3-8 2024
BENEVENTO, ITALY

„Reforming Undergraduate Education for GR^een and Sustainable Development in AR^menia and MO^lDova”

December 2-7, 2024

IMPACT OF ARTIFICIAL INTELLIGENCE ON EDUCATION

Prof.ssa Maria Tortorella – Dr. Nazzareno D’Agostino

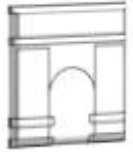


UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento



Trained staff on
outcomes and digital oriented
teaching and learning

Systematic mapping project



DECEMBER, 3-8 2024
BENEVENTO, ITALY

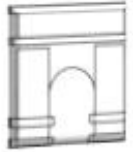
- Motivations for the Research
- Research Goal
- Reference Context
- Selection of Studies to Analyze
- Technologies
- Beneficiaries
- Conclusions



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento



Trained staff on
outcomes and digital oriented
teaching and learning



DECEMBER, 3-8 2024
BENEVENTO, ITALY

Artificial intelligence technologies represent a reality in many area of daily life,
they allow machines to carry out typically human tasks
One of the fields where will have the greatest impact in the coming years is:

EDUCATION

Motivations for the Research

What does the global scientific community think?

How much debate is there on this topic among professionals?

How do perspectives differ across countries?



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento



Trained staff on
outcomes and digital oriented
teaching and learning

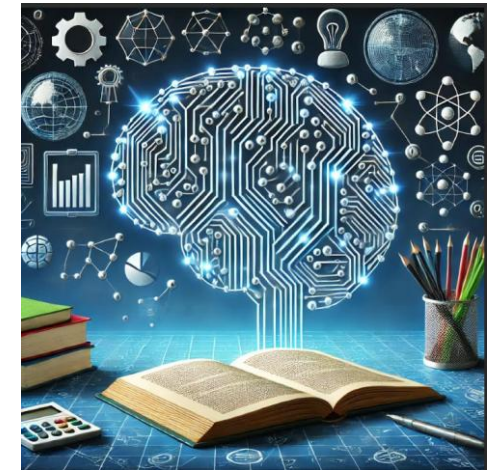
Research Goal:

DECEMBER, 3-8 2024
BENEVENTO, ITALY

What are the impacts of Artificial Intelligence in school education?

Analyze how different cultures address the issue

- Which countries are investing more in research
- Understand how the phenomenon has been evolving in recent years



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento



Trained staff on
outcomes and digital oriented
teaching and learning



DECEMBER, 3-8 2024
BENEVENTO, ITALY

Chiu et al. - Systematic literature review on opportunities, challenges, and future research recommendations of artificial intelligence in education - Computers and Education: Artificial Intelligence - 2021

Fan Ouyang et al. - Computers and Education: Artificial Intelligence – Artificial intelligence in education - 2021

Lijia Chen et al. - Artificial Intelligence in Education: A Review – IEEE - 2020

Yukyeong Song et al. - A framework for inclusive AI learning design for diverse learners - Computers and Education: Artificial Intelligence - 2023

Florence Martin et al. - Systematic review of research on artificial intelligence in K-12 education (2017–2022) - Computers and Education: Artificial Intelligence - 2023

Olaf Zawacki-Richter et al. – Systematic review of research on artificial intelligence applications in higher education – where are the educators? – International Journal of Educational Technology in Higher Education - 2019



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento

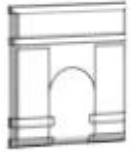
Reference Context

- **Linked Reviews**
- **The Use of Artificial Intelligence Techniques in Education**



Trained staff on
outcomes and digital oriented
teaching and learning

Selection of Studies to Analyze



DECEMBER, 3-8 2024
BENEVENTO, ITALY



ScienceDirect

339 Articles Selected

[TITLE: ARTIFICIAL AND INTELLIGENCE AND
EDUCATION] OR [ABSTRACT: ARTIFICIAL
AND INTELLIGENCE AND EDUCATION]



4136* Articles

*IEEE Xplore only journal publications



Publication from the period between 2019 -2024 Published in English



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento



Trained staff on
outcomes and digital oriented
teaching and learning

Source Distribution:

339 articles were reviewed



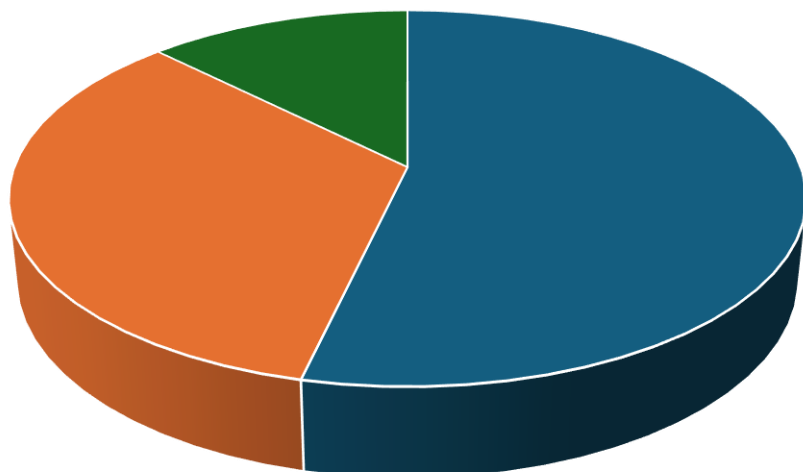
DECEMBER, 3-8 2024
BENEVENTO, ITALY



ScienceDirect



IEEE Xplore®



■ Science direct ■ ACM ■ IEEE Xplore

IEEE Conference	0	0,00%
IEEE Journal	39	11,50%
ACM Conference	105	30,97%
ACM Journal	11	3,24%
Science direct Conference	0	0,00%
Science direct Journal	184	54,28%



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento

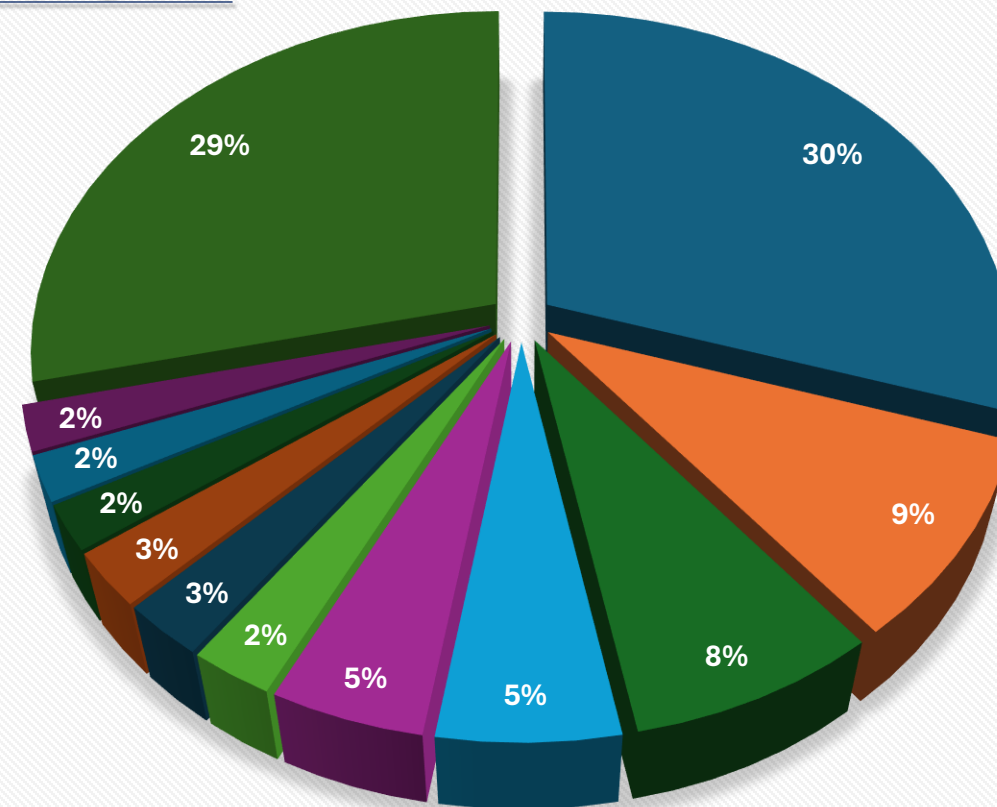
REGR
ERASMUS
#10112



Trained staff on
outcomes and digital oriented
teaching and learning

Source Distribution:

Journal



- Computers and Education: Artificial Intelligence
- IEEE Access
- Heliyon
- Computers in Human Behavior

DECEMBER, 3-8 2024
BENEVENTO, ITALY



Journal	Count	Proportion	Cumulative Proportion
Computers and Education: Artificial Intelligence	70	29,9%	29,9%
IEEE Access	22	9,4%	39,3%
Heliyon	18	7,7%	47,0%
Computers in Human Behavior	13	5,6%	52,6%
Procedia Computer Science	11	4,7%	57,3%
IEEE Transactions on Learning Technologies	6	2,6%	59,8%
Computer & Education	6	2,6%	62,4%
Computer & Education Open	6	2,6%	65,0%
Expert Siystem with Applications	5	2,1%	67,1%
Social Science e Humanities Open	5	2,1%	69,2%
The International Journal of Management Education	5	2,1%	71,4%
Others	67	28,6%	100,0%
Sum	234	100%	

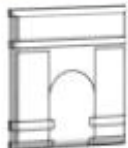


UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento



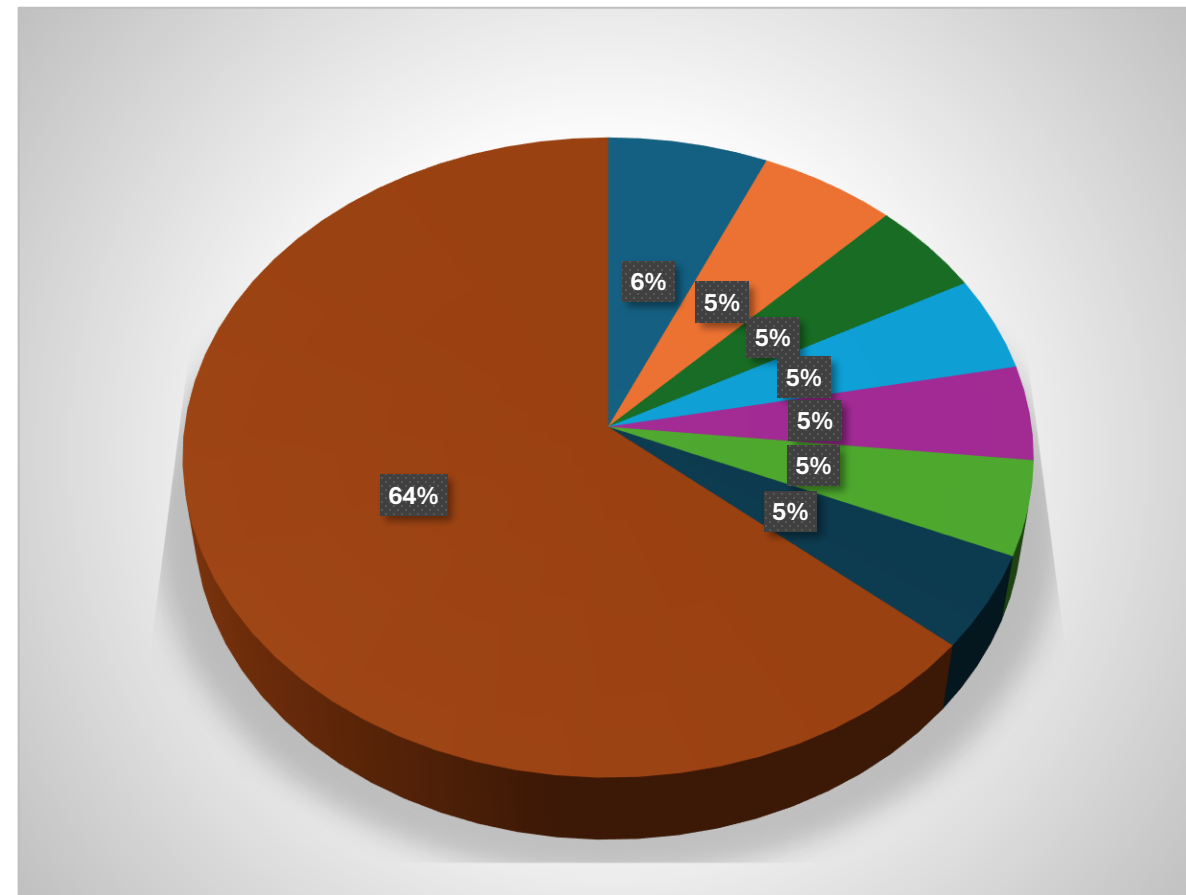
Trained staff on
outcomes and digital oriented
teaching and learning

Source Distribution:



DECEMBER, 3-8 2024
BENEVENTO, ITALY

Conference	Count	Proportion
International Conference on Information Systems and Computer Aided Education	7	6,67%
International Conference on Education and Multimedia Technology	6	5,71%
International Conference on Education and E-Learning	5	4,76%
International Conference on E-Business, Information Management and Computer Science	5	4,76%
International Conference on Distance Education and Learning	5	4,76%
International Conference on Information Education and Artificial Intelligence	5	4,76%
Social Science e Humanities Open	5	4,76%
Others	67	63,81%
Sum	105	100%



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento



Source Distribution:

Distribution of different types of research, which have been categorized into four columns: Review and Survey, Research, Practice

Publication tipe	Sum		Review and Survey		Research		Practice	
	339		114	33,6%	184	54,3%	41	12,1%
	Count	%	Count	%	Count	%	Count	%
Journal publication	234	69,0%	96	84,2%	117	63,6%	21	51,2%
Conference publication	105	31,0%	18	15,8%	67	36,4%	20	48,8%

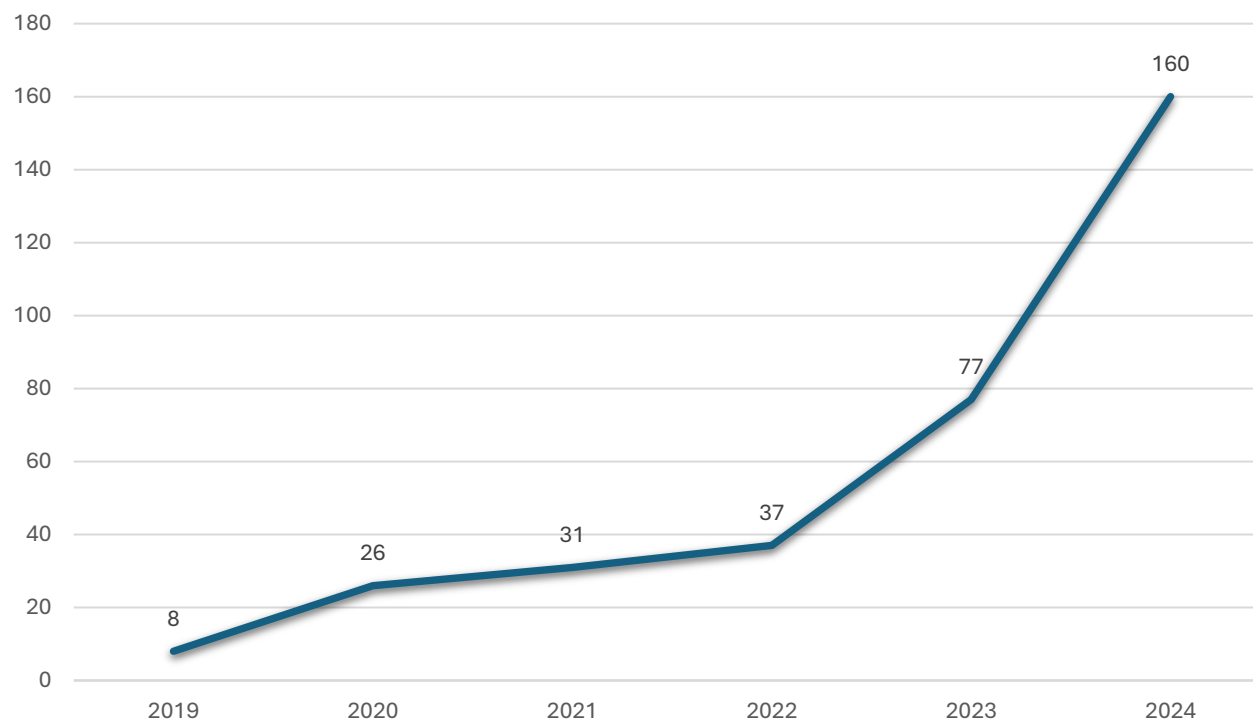
Trained staff on
outcomes and digital oriented
teaching and learning

Distribution of articles over the years

- An exponential increase in the number of publications over time
 - 47% of the total published papers in 2024 alone

Year/Count

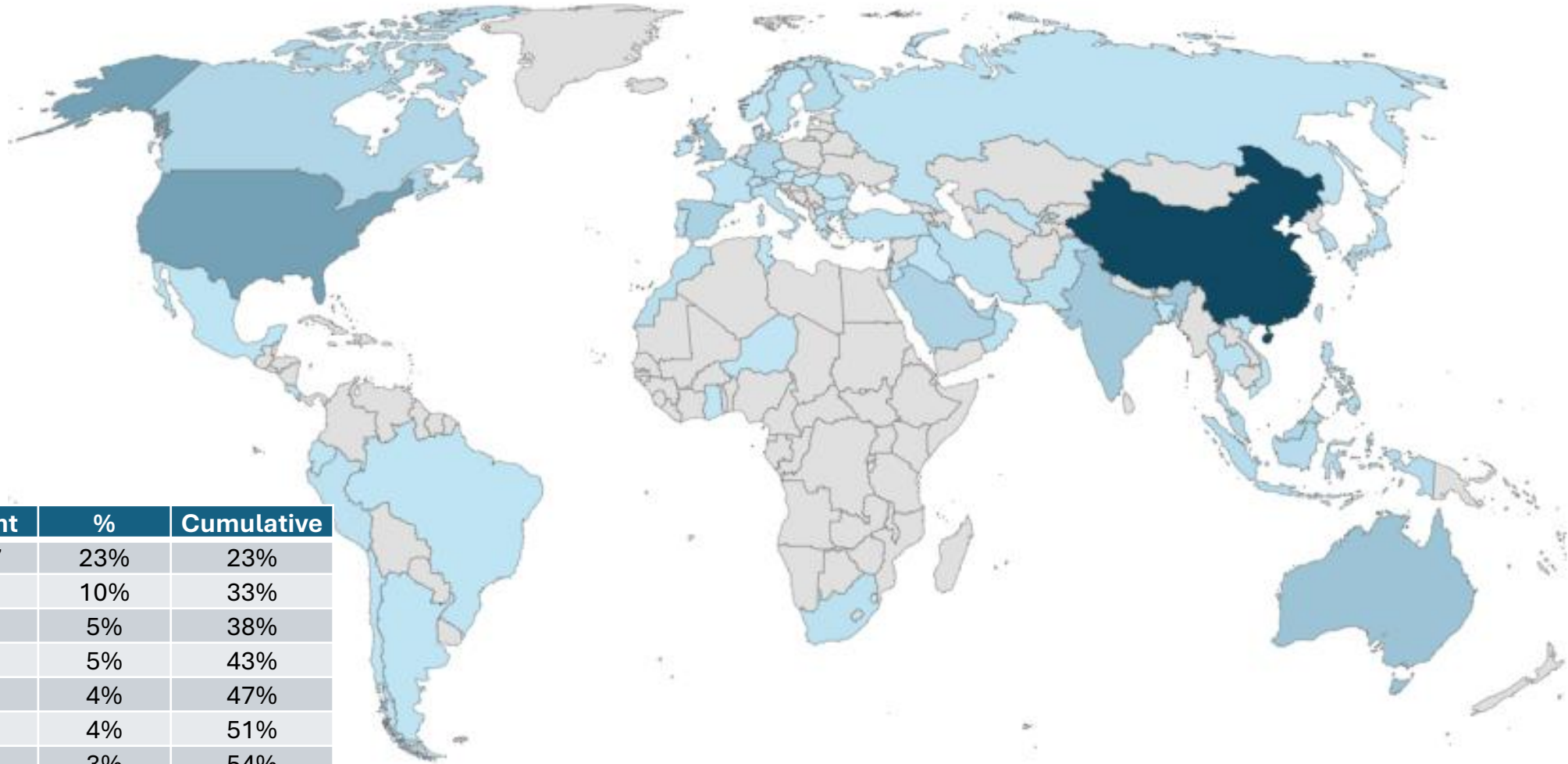
Year	Count	Proportion fk	Cumulatove proportion
2019	8	2,4%	2,4%
2020	26	7,7%	10,0%
2021	31	9,1%	19,2%
2022	37	10,9%	30,1%
2023	77	22,7%	52,8%
2024	160	47,2%	100,0%



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento



Distribution of studies around the world



	Count	%	Cumulative
China	107	23%	23%
USA	47	10%	33%
Honk Kong	25	5%	38%
Australia	23	5%	43%
India	20	4%	47%
UK	19	4%	51%
Spain	14	3%	54%
Saudi Arabia	13	3%	57%
United Arab Emirates	11	2%	59%
Germany	11	2%	62%
Canada	11	2%	64%
Malaysia	10	2%	66%
Taiwan	9	2%	68%
Finland	8	2%	70%

Regarding geographic distribution, China and the USA account for approximately one-third of all research activity. China and Honk Kong account for 30%. China, USA, Hong Kong, Australia, the UK, and India, they represent more than half of the total.

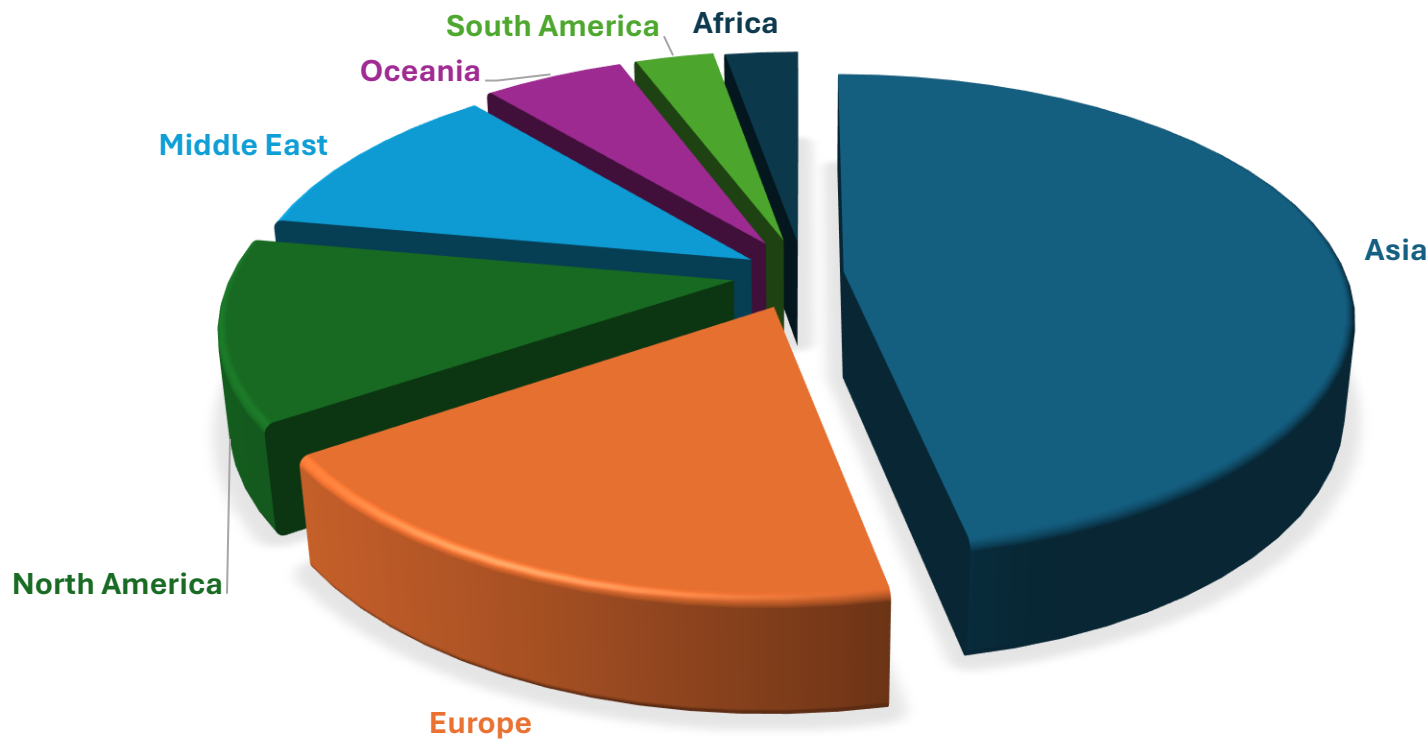
Trained staff on
outcomes and digital oriented
teaching and learning

Distribution of studies by geographical area



DECEMBER, 3-8 2024
BENEVENTO, ITALY

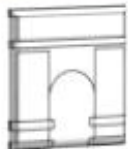
Asia	220	46,80%	46,80%
Europe	88	18,70%	65,50%
North America	58	12,30%	77,90%
Middle East	52	11,10%	88,90%
Oceania	25	5,30%	94,30%
South America	14	3,00%	97,20%
Africa	13	2,80%	100,00%



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento

REGRA2
ERASMUS + Project
#101128817

Trained staff on
outcomes and digital oriented
teaching and learning



DECEMBER, 3-8 2024
BENEVENTO, ITALY

Beijing Normal University Beijing, China	6
Tianjin University, China	5
Macao Polytechnic University, Macao, China	4
Wuhan Business University, China	4
Chongqing Normal University China	3
Huaihua University, Hunan, China	3
Wenzhou University, Wenzhou, China	3
Northwest Normal University, Lanzhou, China	3
Nanning Normal University, China	3
Zhejiang Normal University, Jinhua, China	3
University of Hong Kong, Hong Kong	9
The Chinese University of Hong Kong, Hong Kong	5
The Education University of Hong Kong, Hong Kong	5
The Education University of Hong Kong, Hong Kong	4
Lingnan University, Hong Kong	3
Kennesaw State University, USA	3
North Carolina State University, Raleigh, NC, USA	3
Monash University, Victoria, Australia	5
Swinburne University of Tecnology, Australia	3
King Saud University, Riyadh, Saudi Arabia	3
University of Hail, Hail City, Saudi Arabia	3
University of Science and Tecnology - Taipei, Taiwan	3
British Columbia, Vancouver, Canada	3
University of Eastern Finland (UEF), Finland	7
University of Cambridge, Cambridge, United Kingdom	6
Higher Colleges of Technology, Abu Dhabi, UAE	3

Authors and Affiliations

- The analysis revealed a total of over 1000 different authors
 - and 478 different affiliations

Thomas K.F. Chiu	5
Tenzin Doleck	5
Gwo-Jen Hwang	5
Bahar Memarian	4
Dragan Gašević	4
Ismaila Temitayo Sanusi	4
Roberto Martinez-Maldonado	4
Jiahong Su	3

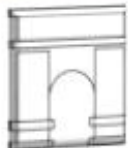


UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento



Trained staff on
outcomes and digital oriented
teaching and learning

Tecnologies considered in the study



DECEMBER, 3-8 2024
BENEVENTO, ITALY

Applications	count	%
	ChatGPT	78
GenAI	16	4,40%
Machine Learning	9	2,47%
Deep Learning	6	1,65%
E-Learning	5	1,37%
AI Robot	5	1,37%
Big Data	4	1,10%
Learning Analytics	3	0,82%
Undeclared	161	44,23%
Others	77	21,15%
Sum	364	100,00%

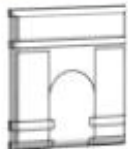
One of the most evident results is the fact that a large portion of the articles that specifically mention the application considered in the study are about ChatGPT



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento



Trained staff on
outcomes and digital oriented
teaching and learning



DECEMBER, 3-8 2024
BENEVENTO, ITALY

The beneficiaries of the works

The beneficiaries of the works it typically refers to students and/or teachers

AI offers unique opportunities also for schools as institutions, for example, in administrative management.

It is also common for many to request that policymakers and researchers further explore the ethical aspects of using such technologies.

Beneficiaries

count	%
225	41,51%
169	31,18%
65	11,99%
62	11,44%
21	3,87%

Students

Teachers

Decision-makers

Researchers

Undefined



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento



Trained staff on outcomes and digital oriented teaching and learning

DECEMBER, 3-8 2024
BENEVENTO, ITALY

Trained staff on outcomes and digital oriented teaching and learning



Artificial intelligence technologies represent a reality in many areas of daily life, they allow machines to carry out typically human tasks
One of the fields where will have the greatest impact in the coming years is:

EDUCATION

Motivations for the Research

- What does the global scientific community think?
- How much debate is there on this topic among professionals?
- How do perspectives differ across countries?



Conclusions:

Trained staff on outcomes and digital oriented teaching and learning



Selection of Studies to Analyze



339 Articles Selected



4136* Articles
*IEEE Xplore only journal publications



Publication from the period between 2019 - 2024 Published in English

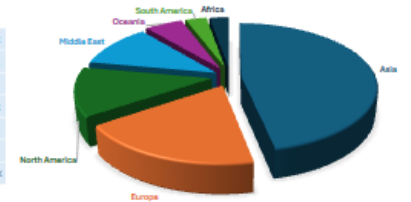


Trained staff on outcomes and digital oriented teaching and learning



Distribution of studies by geographical area

Area	Count	%	Total
Asia	220	46,80%	46,80%
Europe	88	18,20%	65,00%
North America	58	12,30%	77,00%
Middle East	52	11,10%	88,00%
Oceania	25	5,30%	94,00%
South America	14	3,00%	97,00%
Africa	15	3,80%	100,00%



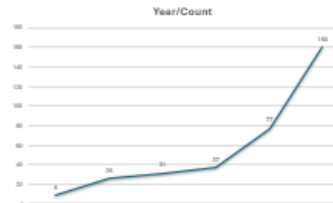
Trained staff on outcomes and digital oriented teaching and learning



Distribution of articles over the years

- An exponential increase in the number of publications over time
- 47% of the total published in 2024 alone

Year	Count	Proportion %	Cumulative proportion
2019	8	2,4%	2,4%
2020	26	7,7%	10,0%
2021	31	9,1%	19,2%
2022	37	10,9%	30,1%
2023	77	22,7%	52,8%
2024	160	47,2%	100,0%



Trained staff on outcomes and digital oriented teaching and learning



Authors and Affiliations

- The analysis revealed a total of over 1000 different authors
- and 478 different affiliations

Beijing Normal University Beijing, China	8
Harbin University, China	2
Macau Polytechnic University, Macau, China	2
Wuhan Business University, China	2
Chongqing Normal University, China	2
Heilongjiang University, Harbin, China	2
Wenzhou University, Wenzhou, China	2
North China Normal University, Langfang, China	2
Nanjing Normal University, China	2
Zhejiang Normal University, Jinhua, China	2
University of Hong Kong, Hong Kong	2
The Chinese University of Hong Kong, Hong Kong	2
The Education University of Hong Kong, Hong Kong	2
Sunshine University of Technology, Australia	2
Ungerskiy University, Hong Kong	2
Rensselaer State University, USA	2
North Carolina State University, Raleigh, NC, USA	2
Monash University, Victoria, Australia	2
Swinburne University of Technology, Australia	2
Sing Sing University, Riyadh, Saudi Arabia	2
University of Hail, Hail City, Saudi Arabia	2
University of Science and Technology, Taipei, Taiwan	2
British Columbia, Vancouver, Canada	2
University of Eastern Finland (UEF), Finland	2
University of Cambridge, Cambridge, United Kingdom	2
Higher Colleges of Technology, Abu Dhabi, UAE	2



Trained staff on outcomes and digital oriented teaching and learning



Application considered in the study

Applications	count	%
ChatGPT	78	21,43%
GenAI	16	4,40%
Machine Learning	9	2,47%
Deep Learning	6	1,65%
E-Learning	5	1,37%
AI Robot	5	1,37%
Big Data	4	1,10%
Learning Analytics	3	0,83%
Undeclared	161	44,33%
Others	77	21,15%
Sum	364	100,00%

One of the most evident results is the fact that a large portion of the articles that specifically mention the application considered in the study are about ChatGPT



UNIVERSITÀ DEGLI STUDI
DEL SANNIO Benevento

REGRA ERASMUS + Project #101128817