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Artificial Intelligence as a Factor Revolutionizing Higher Education

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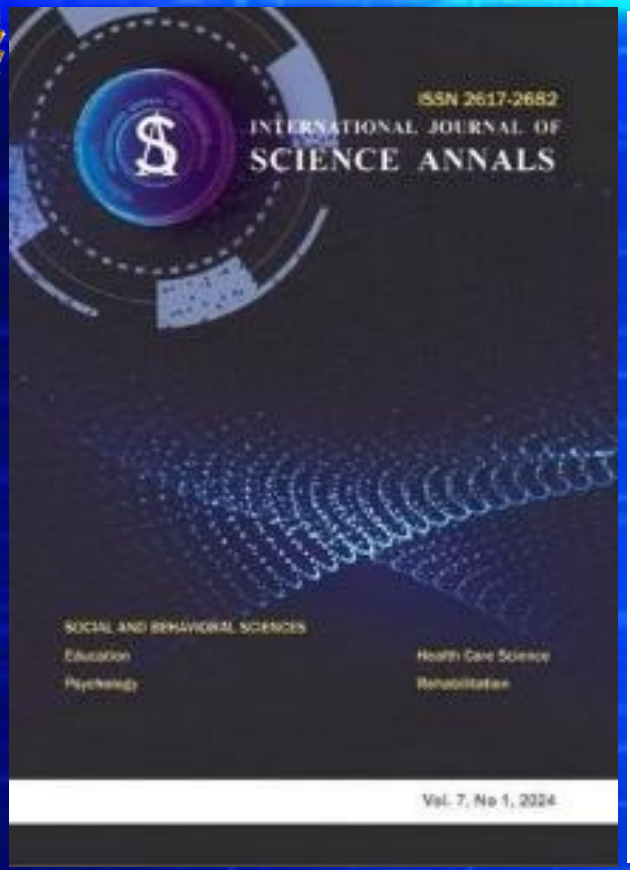


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Artificial Intelligence as a Factor Revolutionizing Higher Education

Authors' Contribution:
A – Study design;
B – Data collection;
C – Statistical analysis;
D – Data interpretation;
E – Manuscript preparation;
F – Literature search;
G – Funds collection

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Abstract

Background and Aim of Study: *The use of artificial intelligence and various chatbots based on it is becoming part of everyday higher education practice. The aim of the study: to explore practices and identify trends in the use of artificial intelligence-based chatbots by higher education stakeholders.*

Material and Methods: *The survey was conducted between January and April 2024. The total number of respondents from 57 countries was 788, of whom 363 were students and 425 were university faculty. The probability sampling method was applied. Respondents were interviewed online. The questionnaire is available on the official website of the Scientific Research Institute KRPOCH using Google Forms, as well as on social networks Facebook, LinkedIn, etc. for potential participants. In addition, a selective individual online interview was conducted with respondents. Cronbach's alpha confirmed adequate internal consistency (α=0.837).*

Results: *The role of artificial intelligence-based chatbots in higher education practice was considered. The use of chatbots among higher education stakeholders (students and faculty) was studied. A model of stakeholder behaviour was developed. This model describes two ways of solving problems: with and without the use of artificial intelligence. Trends in the use of chatbots in higher education were identified: students were 26.9% more likely than faculty to use artificial intelligence-based chatbots to prepare for classes or complete assignments at their college/university; almost all students (68.0% of 68.3% who use chatbots) edited the results returned by generative chatbots at their request; students were 30.1% more likely than faculty to edit these results.*

Conclusions: *The new technologies of generative artificial intelligence have been the factors that have revolutionised the industry of higher education. A new "Human–AI" system has emerged that is fundamentally changing the rules for training young professionals. The study emphasizes that higher education stakeholders using chatbots should do so correctly, consider the possibilities and limitations of using this toolkit, and recognize their responsibility for the outcomes and consequences of their use.*

Keywords: *education, artificial intelligence, chatbots, Human-AI system, interaction, responsibility, stakeholder*

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Research Methods

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Research Findings

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Comparative Characteristics of Respondents Grouped by Country

Country	Respondents, people		Respondents, %		Respondents, people		Respondents, %		Respondents, total	
	Students	Faculty	Students	Faculty	Male	Female	Male	Female	People	%
US	21	24	2.7	3.0	31	14	3.9	1.8	45	5.7
India	23	21	2.9	2.7	21	23	2.7	2.9	44	5.6
Ukraine	36	3	4.6	0.4	4	35	0.6	4.4	39	4.9
Indonesia	21	18	2.7	2.3	25	14	3.2	1.8	39	4.9
Singapore	16	19	2.0	2.4	16	19	2.0	2.4	35	4.4
China	18	16	2.3	2.0	15	19	1.9	2.4	34	4.3
UK	18	15	2.3	1.9	16	17	2.0	2.2	33	4.2
Canada	17	14	2.2	1.8	12	19	1.5	2.4	31	3.9
Japan	16	14	2.0	1.8	14	16	1.8	2.0	30	3.8
Australia	15	13	1.9	1.6	11	17	1.4	2.2	28	3.6
Portugal	11	16	1.4	2.0	10	17	1.3	2.2	27	3.4
Germany	8	18	1.0	2.3	12	14	1.6	1.7	26	3.3
France	11	15	1.4	1.9	12	14	1.6	1.7	26	3.3
Spain	10	14	1.3	1.8	11	13	1.5	1.6	24	3.0
Italy	10	11	1.3	1.4	9	12	1.1	1.5	21	2.7
Brazil	9	12	1.1	1.5	10	11	1.3	1.4	21	2.7
Philippines	12	8	1.5	1.0	8	12	1.0	1.5	20	2.5
Austria	10	8	1.3	1.0	10	8	1.3	1.0	18	2.3
Denmark	8	5	1.0	0.6	4	9	0.5	1.1	13	1.6
Ireland	2	10	0.3	1.3	6	6	0.7	0.8	12	1.5
Israel	9	3	1.1	0.4	5	7	0.6	0.9	12	1.5
Sweden	5	6	0.6	0.8	6	5	0.7	0.7	11	1.4
South Africa	2	8	0.3	1.0	5	5	0.7	0.6	10	1.3
South Korea	3	7	0.4	0.9	4	6	0.5	0.8	10	1.3
New Zealand	6	5	0.8	0.6	6	5	0.7	0.7	11	1.4
UAE	2	7	0.3	0.9	5	4	0.6	0.5	9	1.1
Finland	1	8	0.1	1.0	5	4	0.6	0.5	9	1.1
Czech Republic	3	5	0.4	0.6	3	5	0.4	0.6	8	1.0
Argentina	1	6	0.1	0.8	4	3	0.5	0.4	7	0.9
Poland	3	4	0.4	0.5	4	3	0.5	0.4	7	0.9
Estonia	1	6	0.1	0.8	3	4	0.4	0.5	7	0.9
Switzerland	2	5	0.3	0.6	4	3	0.5	0.4	7	0.9
Lithuania	1	5	0.1	0.6	2	4	0.3	0.5	6	0.8
Belgium	0	6	0.0	0.8	3	3	0.4	0.4	6	0.8
Mexico	0	6	0.0	0.8	2	4	0.3	0.5	6	0.8
Saudi Arabia	2	4	0.3	0.5	4	2	0.5	0.3	6	0.8
Nigeria	1	5	0.1	0.6	5	1	0.6	0.1	6	0.8
Malaysia	2	4	0.3	0.5	3	3	0.4	0.4	6	0.8
Romania	0	6	0.0	0.8	2	4	0.3	0.5	6	0.8
Greece	1	4	0.1	0.5	1	4	0.1	0.5	5	0.6
Iceland	4	1	0.5	0.1	3	2	0.3	0.3	5	0.6
Tunisia	2	3	0.3	0.4	3	2	0.3	0.3	5	0.6
Latvia	2	3	0.3	0.4	3	2	0.3	0.3	5	0.6
Norway	1	4	0.1	0.5	3	2	0.3	0.3	5	0.6
Slovakia	1	4	0.1	0.5	3	2	0.3	0.3	5	0.6
Turkey	0	5	0.0	0.6	3	2	0.3	0.3	5	0.6
Netherlands	3	2	0.4	0.3	3	2	0.3	0.3	5	0.6
Thailand	2	3	0.3	0.4	3	2	0.3	0.3	5	0.6
Taiwan	1	4	0.1	0.5	3	2	0.3	0.3	5	0.6
Oman	3	1	0.4	0.1	3	1	0.4	0.1	4	0.5
Algeria	0	4	0.0	0.5	3	1	0.4	0.1	4	0.5
Bahrain	2	1	0.3	0.1	3	0	0.4	0.0	3	0.4
Colombia	1	2	0.1	0.3	2	1	0.2	0.2	3	0.4
Benin	2	0	0.3	0.0	2	0	0.3	0.0	2	0.3
Iraq	0	2	0.0	0.3	2	0	0.3	0.0	2	0.3
Kenya	1	1	0.1	0.1	1	1	0.1	0.1	2	0.3
Peru	1	1	0.1	0.1	1	1	0.1	0.1	2	0.3
Total	363	425	46.1	53.9	373	415	47.3	52.7	788	100.0

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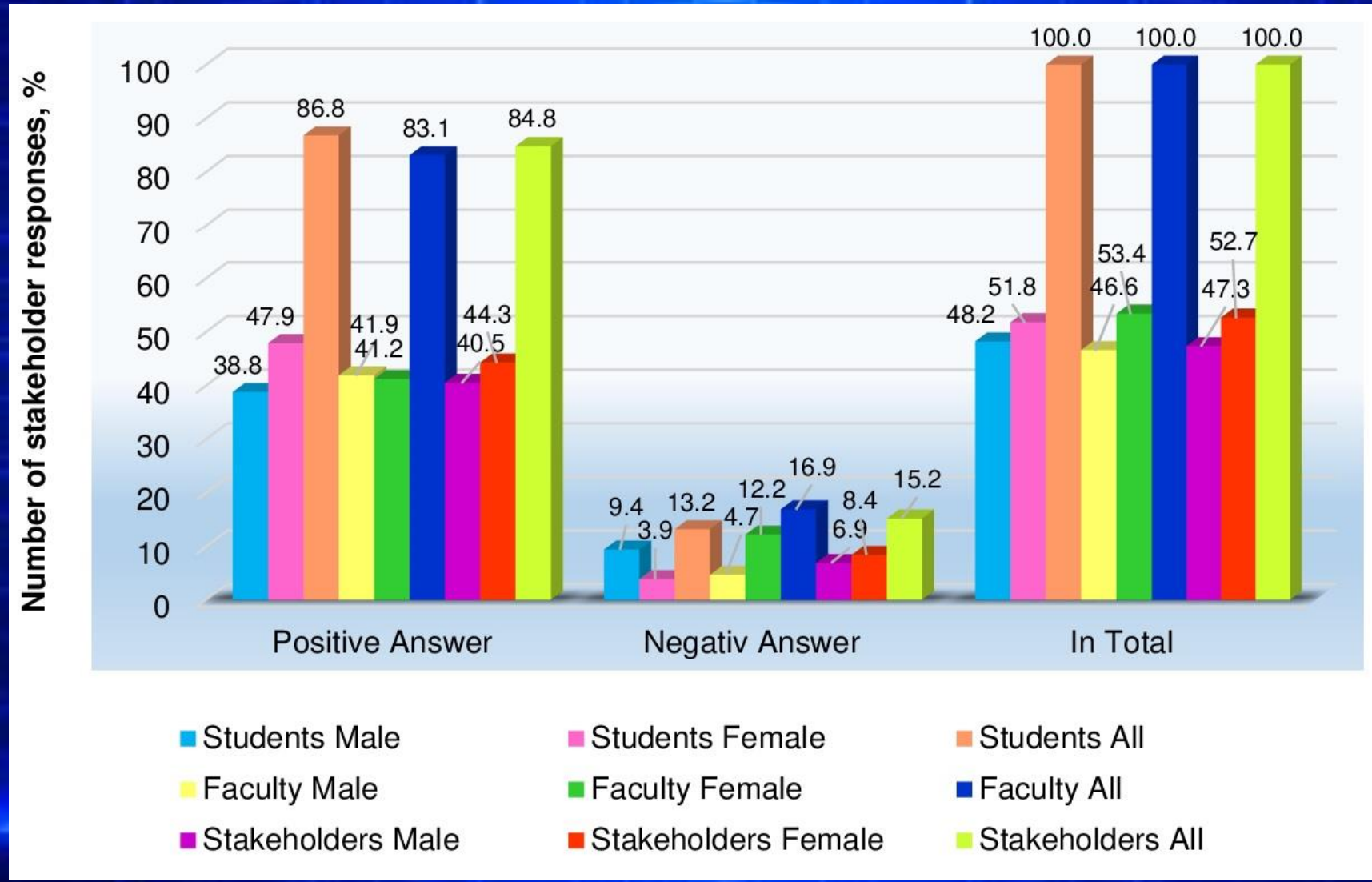
Use of Hybrid (Face-to-Face/Distance) Learning by Higher Education Stakeholders (Students and Faculty) at Their College/University



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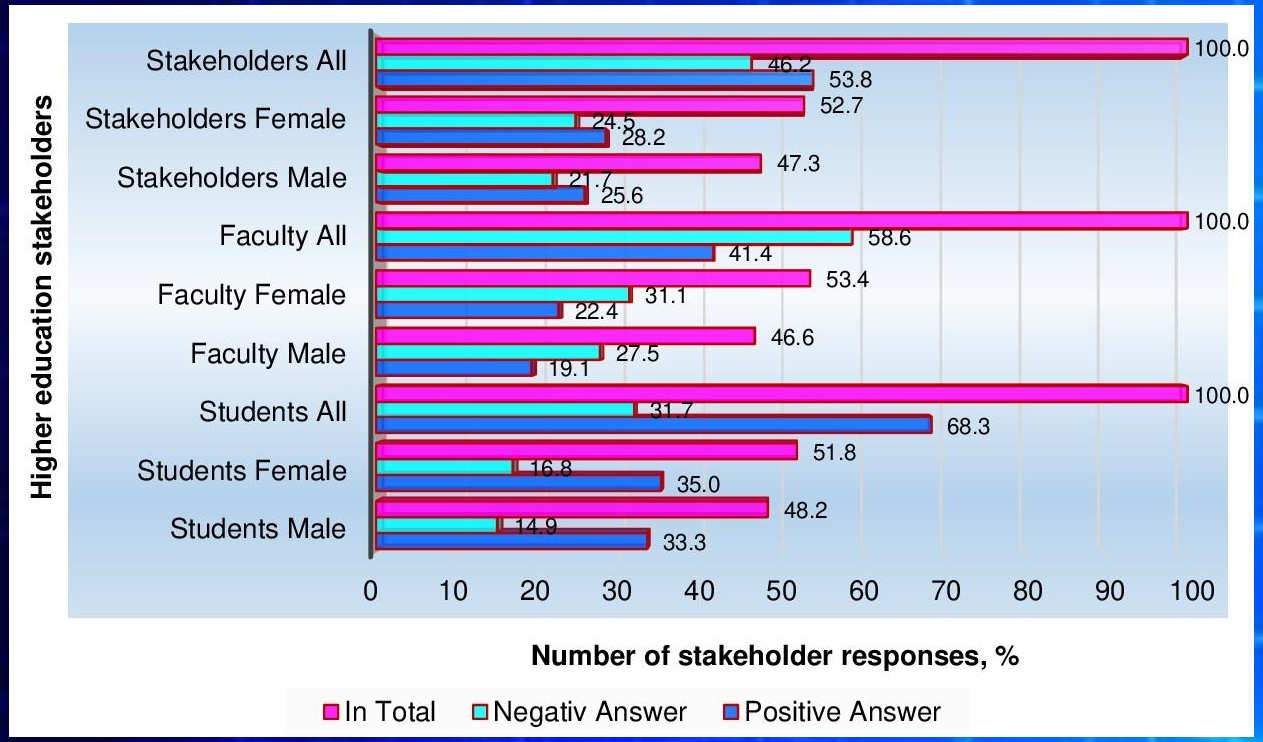
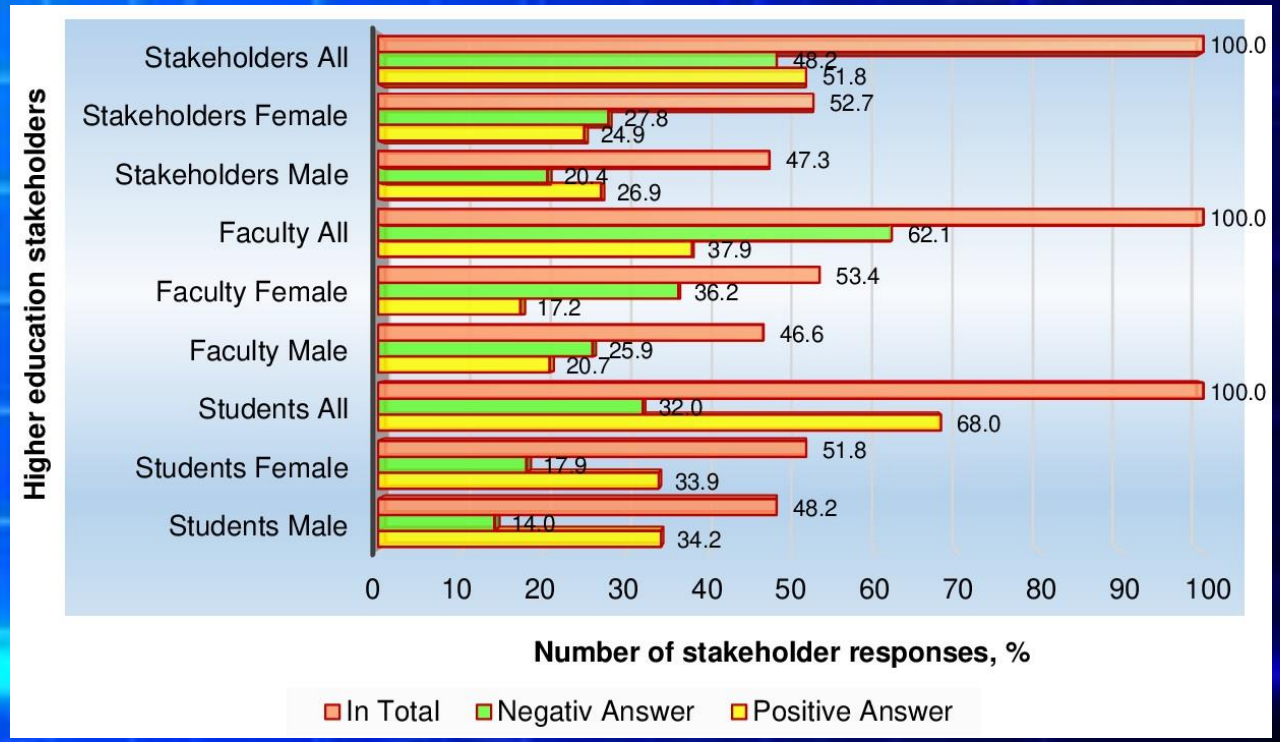
Use of Artificial Intelligence-Based Chatbots by Higher Education Stakeholders (Students and Faculty) to Prepare for Classes or Complete Assignments at Their College/University



Processing of Results by Higher Education Stakeholders (Students and Faculty) Returned by Generative Chatbots for Their Request



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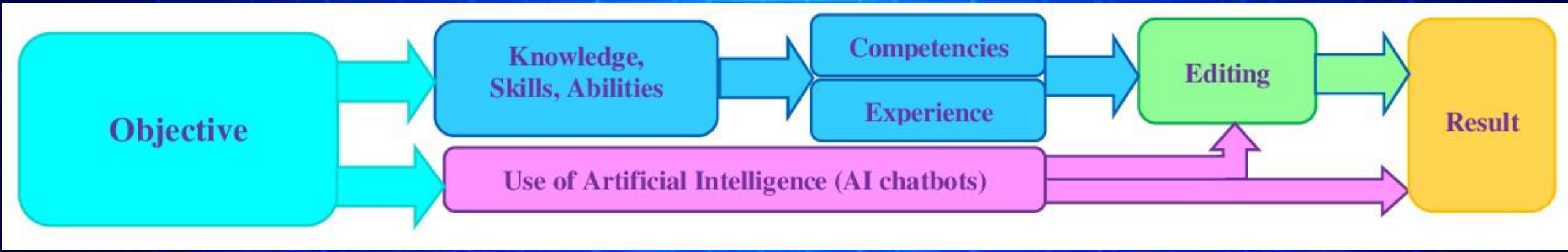
A Model of Stakeholder Behaviour Describing two Options for Problem Solving: With and Without the Use of Artificial Intelligence



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Research Conclusion

The new technologies of generative artificial intelligence have been the factors that have revolutionised the industry of higher education.

A new "Human-AI" system has emerged that is fundamentally changing the rules for training young professionals.

The study emphasizes that higher education stakeholders using chatbots should do so correctly, consider the possibilities and limitations of using this toolkit, and recognize their responsibility for the outcomes and consequences of their use.

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