

Trust in the Age of Generative AI: How Far Can We Believe LLMs?

KEYNOTE PRESENTATION

Presenter

Prof. Dr.-Ing. Rahamatullah Khondoker

Professor for IT Security and Digitalization

THM University of Applied Sciences

Friedberg, Germany

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Fachbereich MND > Start > Rahamatullah Khondoker

Prof. Dr.-Ing. Rahamatullah Khondoker

✉ rahamatullah.khondoker@mnd.thm.de

☎ +49 (0) 6031 604 3441

🖨 +49 (0) 6031 604 185

🔗 <https://www.thm.de/mnd/rahamatullah-khondoker>

🏠 Wilhelm-Leuschner-Straße 10, Zimmer: B2.0.03

⚙ IT-Sicherheitsbeauftragter (MND), Auslandsbeauftragter (Wirtschaftsinformatik), Mitglied im Digitalisierungsbeirat des Landkreises Gießen, IEEE SM, Studiengangsleiter Bachelor of Science "Organisations- und IT-Sicherheit"

🏢 Wirtschaftsinformatik

💬 Nach Absprache per E-Mail



Arbeitsgebiete

- Cyber Security
- Informationssicherheit
- Digitalisierung
- Automotive Security

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Profil

Research Group - CYSEC DIGITAL

Cooperative PhD

Aktuelle Lehrveranstaltungen

Veröffentlichungen

Bachelor/Master Thesis

Industrie (kooperiert/unterstützt)

Kurzzeitige Besuche von Universitäten

Memorandum of Understanding (MOU)

Werdegang

Automotive Cyber Security Academy

Guidelines for a research article

INDO-GERMAN WEEK 2024, THM, Germany

THM Delegation Trip to India, 20 - 25 Jan, 2025



Outline

- ❑ Recent Events
- ❑ History of AI and LLMs
- ❑ Two of Our Research Works
- ❑ Responsible Use of AI
- ❑ Take Away

“AI is likely to be either the best or worst thing to happen to humanity.”

– Elon Musk, CEO of SpaceX and Tesla

Real Incidents That Question Blind Trust in AI

Legal filing with fake citations

“A U.S. judge (P. Kevin Castel) on June 22, 2023, imposed sanctions on two New York lawyers (Steven Schwartz, Peter LoDuca and their law firm Levidow, Levidow & Oberman) who submitted a legal brief that included fictitious case citations generated by an artificial-intelligence chatbot, ChatGPT.”

Source: [Reuters](#)

Impacts:

- **Financial:** Fine issued to the law firm
- **Operational:** Court delays, workflow disruption
- **Security:** Misuse shows vulnerability in legal decision systems

Real Incidents That Question Blind Trust in AI

Fake Pentagon Explosion Image

“On May 22, 2023, an image circulating on social media appearing to show an explosion near the U.S. Department of Defense (Pentagon) turned out to be AI-generated and false.”

Source: [Reuters](#)

Impacts:

- **Financial:** Stock market instability
- **Operational:** Emergency public clarifications required
- **Safety:** Public panic and misinformation spread
- **Security:** National-security misinformation threat

Real Incidents That Question Blind Trust in AI

Risks in AI chatbots for mental-health/emotional support

“Researchers from Brown University found that AI chatbots routinely violate core mental-health ethics standards, giving misleading responses, creating false empathy, and failing to meet professional care benchmarks.”

Source: [Brown University news](#)

Impacts:

- **Financial:** Potential increased healthcare costs
- **Operational:** Platforms forced to suspend/adjust AI systems
- **Privacy:** Sensitive mental-health data exposed
- **Safety:** Harmful or unsafe guidance to vulnerable users
- **Security:** Sensitive health data at risk if systems are breached

Real Incidents That Question Blind Trust in AI

Student cheating surge using AI tools

“During the 2023-24 academic year, UK universities reportedly recorded almost 7000 confirmed cases of students misusing AI tools such as ChatGPT for essays, rising from 1.6 per 1000 students in 2022-23 to 5.1 per 1000 in 2023-24.”

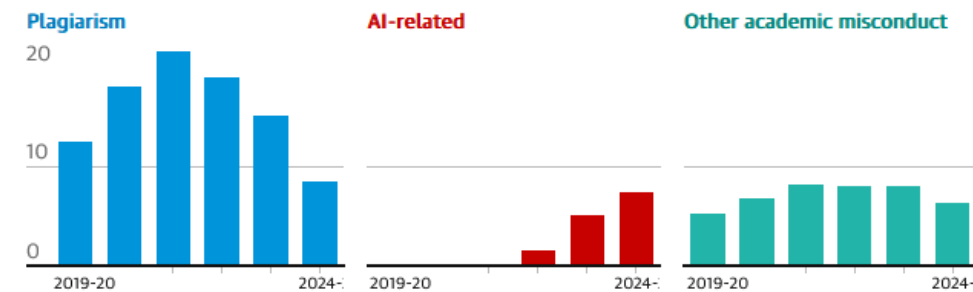
Source: [The Guardian investigation](#)

Impacts:

- **Financial:** Increased spending on AI detection tools
- **Operational:** Higher administrative workload, revised exam policies
- **Privacy:** Student data processed by detection systems
- **Security:** Academic assessment integrity weakened

As plagiarism falls, AI-related misconduct is rising

Proven misconduct cases per 1,000 students



Guardian graphic. Source: Guardian FOI requests. Notes: Between 80 and 125 universities responded depending on year and misconduct category. Rates are per 1,000 student population of universities which responded. 2024-25 is projected based on data to May.

Key Milestones in AI History

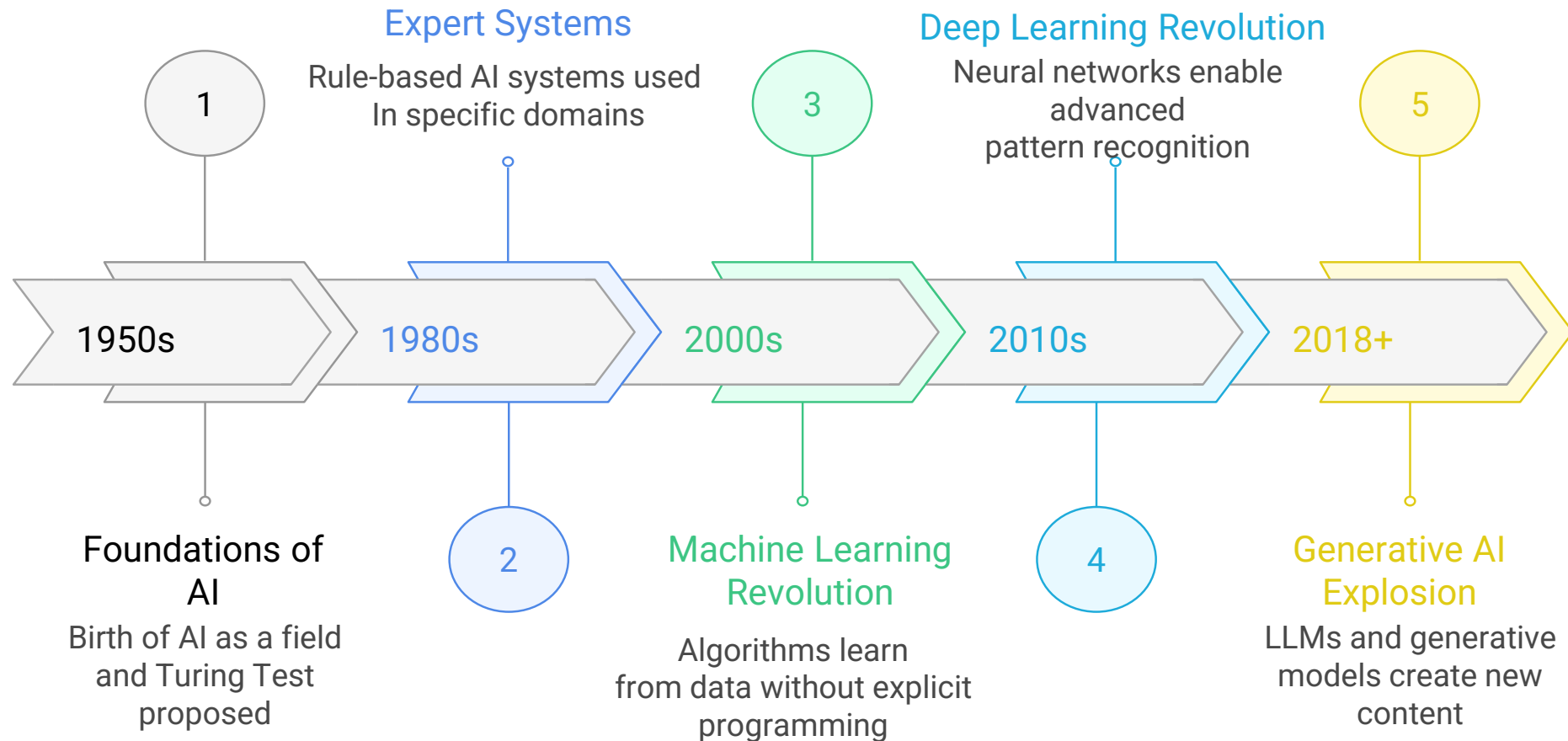


Figure 1: History of Artificial Intelligence

Evolution of Modern Generative AI Models

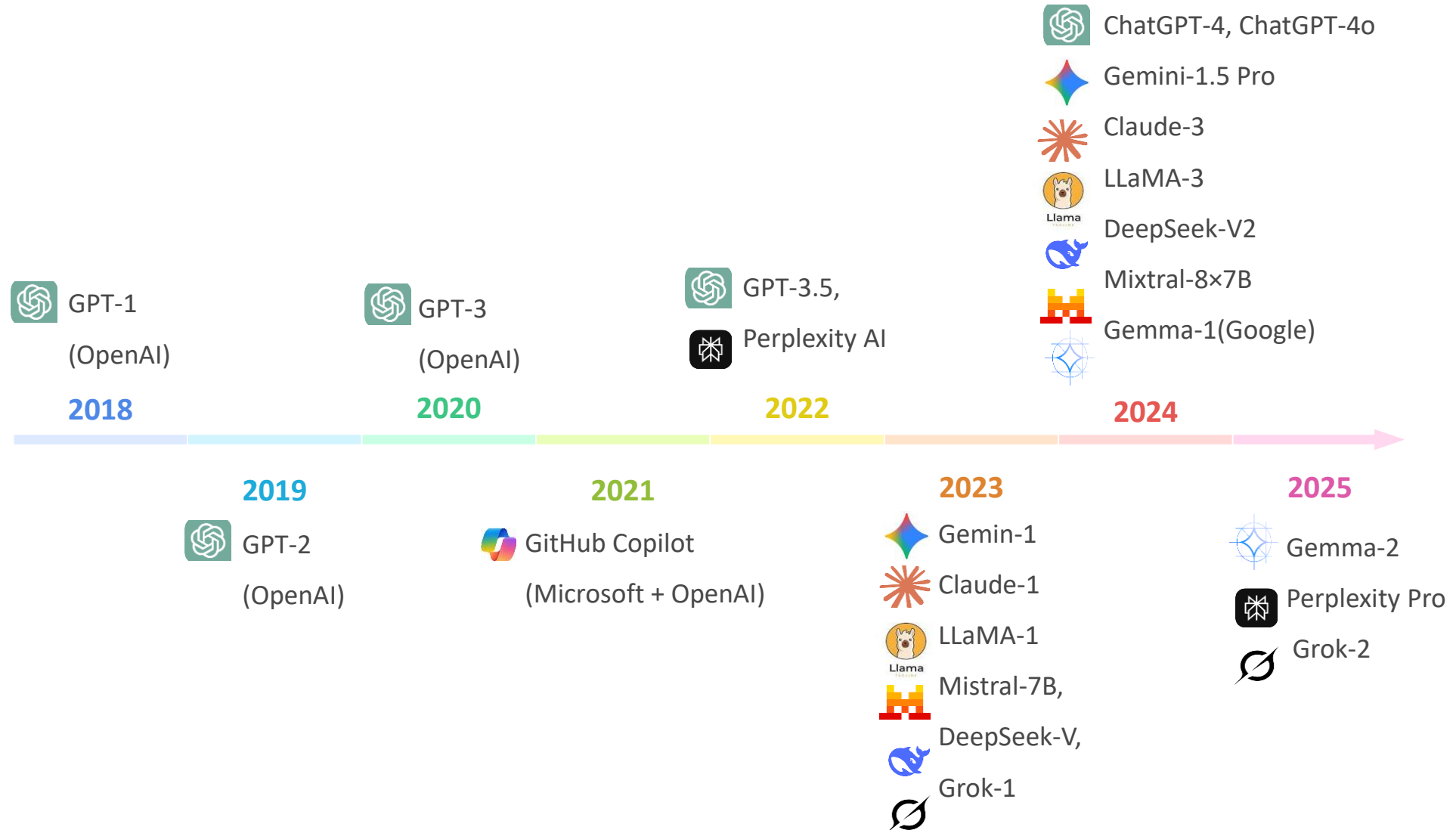


Figure 2: History of Generative AI Models

Use of Artificial Intelligence

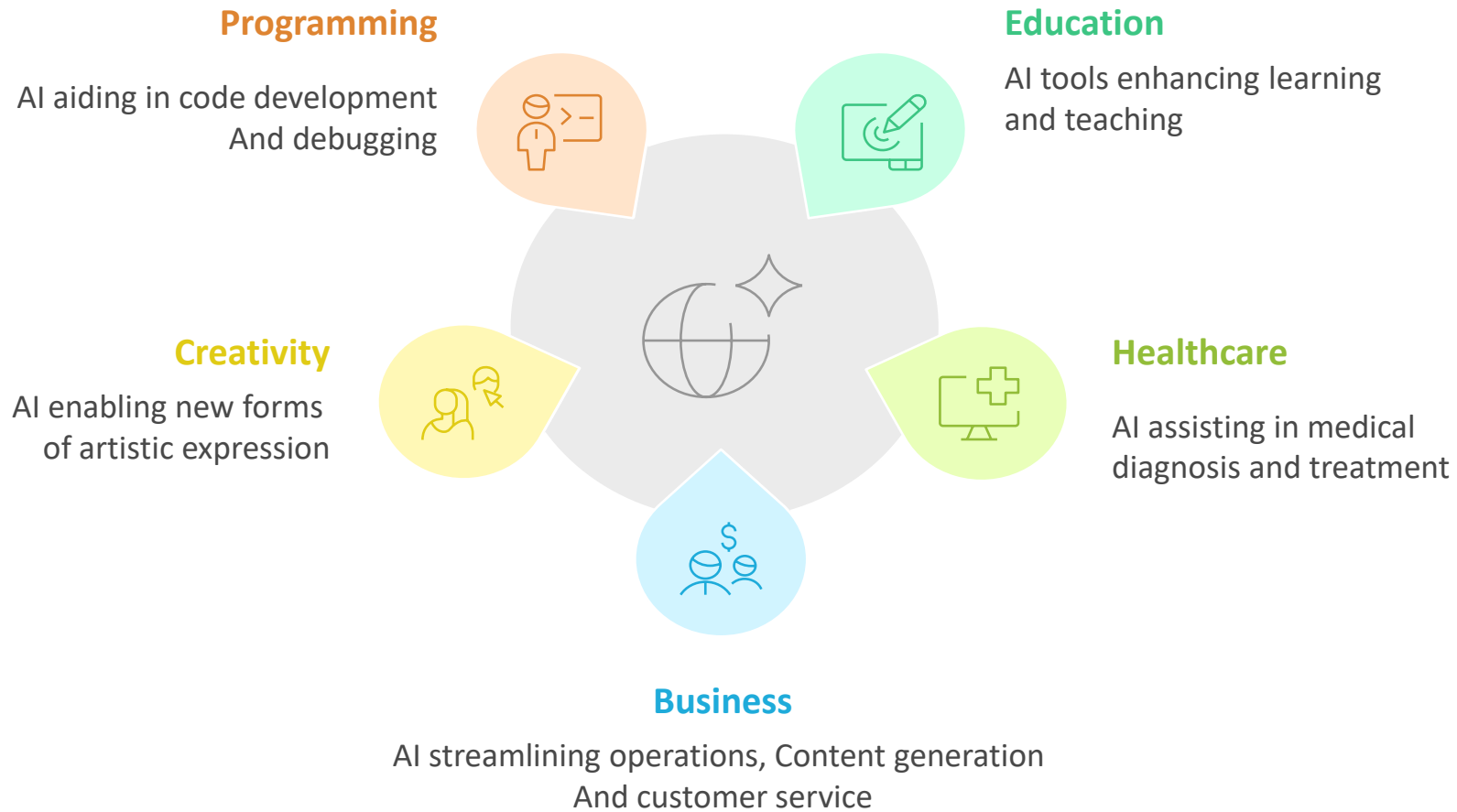


Figure 3: AI Usages

Use of Artificial Intelligence

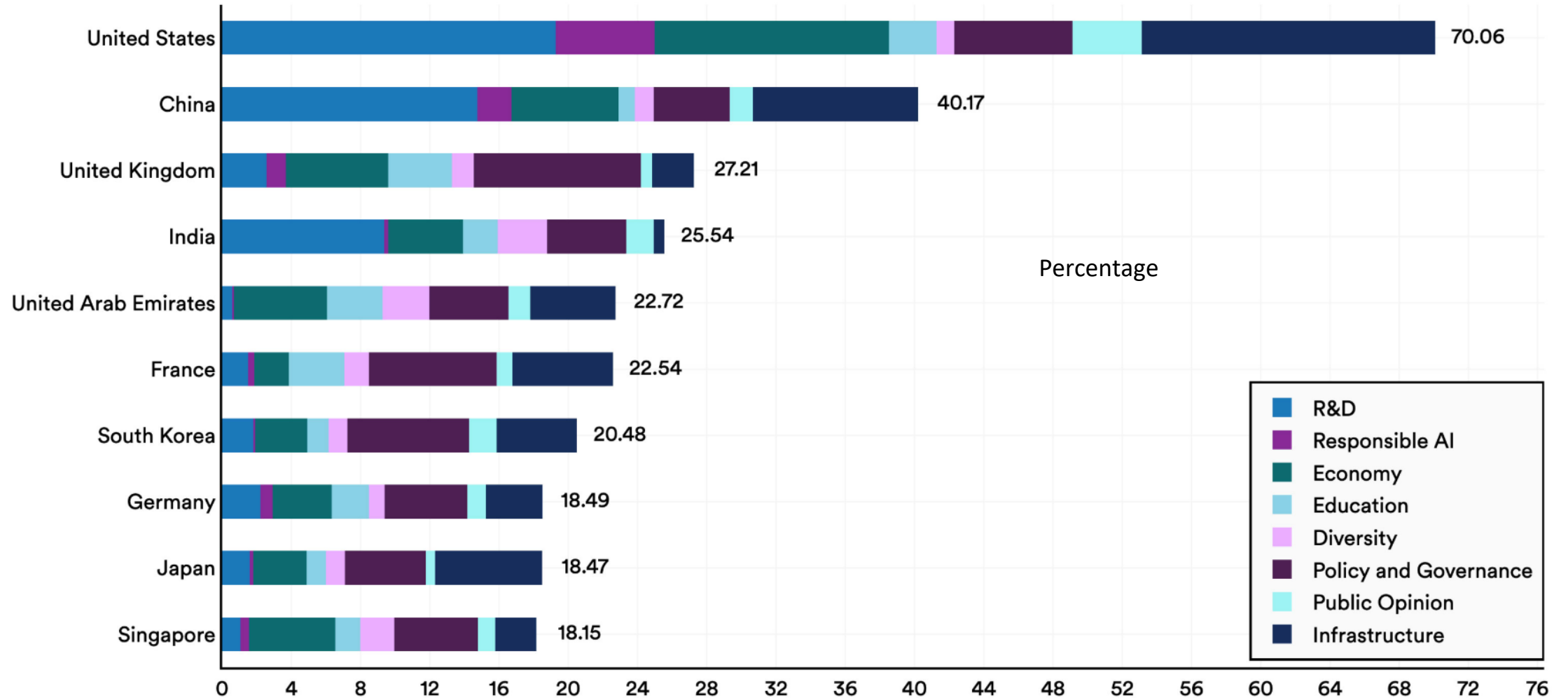


Figure 4: Global AI Ranking According to Stanford HAI's Global AI Vibrancy Tool (Copied)

The Future Possibilities of AI

- Hyper-personalized learning
- AI-supported creativity, innovation, and contents
- Human-AI Collaboration in Decision Making
- Human-AI collaborative work environments
- AI in Governance and Policy

But also risks:

- Trust
- Bias
- Over-reliance



Our Researches

1.

"Will AI Models Pass an IELTS Writing Module? A Comparative Study of ChatGPT-3.5 and ChatGPT-4o in English Writing" (EDMEDIA 2025, Paper: [Link](#))

2.

"Can AI Models Write Like Humans? A Comparative Performance Evaluation of Students, ChatGPT-3.5, ChatGPT-4o, Deepseek, and Gemini AI in English Writing"(eLearn 2025, Paper: [Link](#))

Research Objectives

- Evaluate whether AI Models can write contents like humans.
- Compare the performance of ChatGPT-3.5, ChatGPT-4o, DeepSeek, Gemini, and Students
- Analyze the quality of AI-generated responses.
- Compare the evaluated scores of ChatGPT-3.5, ChatGPT-4o, DeepSeek, Gemini, and Students.

Research Methodology

1. Question Selection

- Initial Pool of Questionnaires
- Formation of Expert Panel
- Initial and Final Question Selection

2. Response Generation by AI Model

- AI Models Configuration
- Input Process
- Response Documentation

3. Student Participants

- Answer written by students
- Response Documentation

4. Evaluation of Responses

- Formation of Evaluation Panel
- Evaluation Criteria
- Assessment Process
- Inter-Rater Reliability

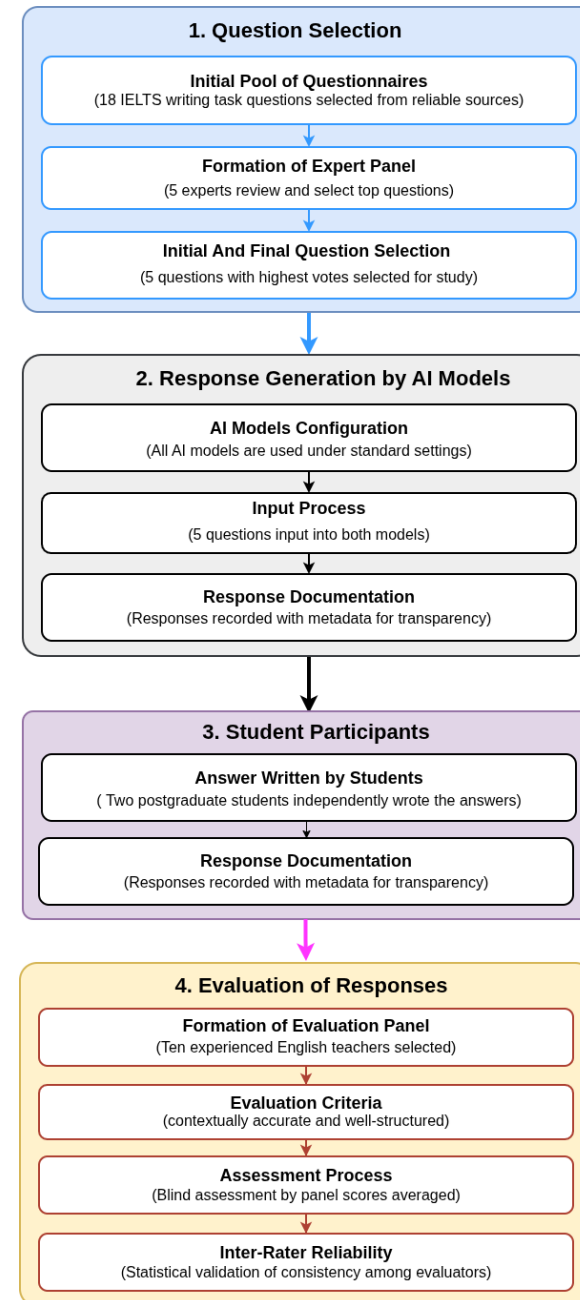


Figure 5: Research Methodology

1. Question Selection

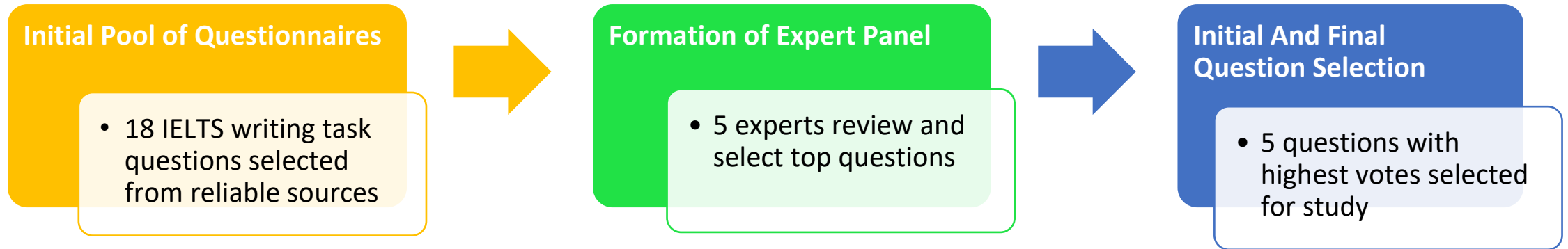


Figure 6: Question Selection Process

- ❑ An initial pool of 18 IELTS Writing questions was selected from reliable sources.
- ❑ A panel of 5 academic experts chosen to selection the questions.
- ❑ The 5 questions most frequently selected by the experts were finalized for this study.

1. Question Selection (Cont.)

Table 1: Question Selection Process

Q. No	Questions	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Total Vote
1	Traffic congestion is a growing problem in many of the world's major cities. Explain some possible reasons for this problem, and suggest some solutions.	✓	✓		✓		3
2	Some people believe that children learn better when they are placed in classes with children of similar academic abilities. Others believe that children learn better when they are in classes with children representing a diverse range of academic abilities. Discuss both these views and give your opinion.			✓		✓	2
3	Some people argue that it is more important to have an enjoyable job than to earn a lot of money. Others disagree and think that a good salary leads to a better life. Discuss both these views and give your own opinion.	✓				✓	2
4	In many parts of the world, there is continuous coverage of sports on television. Some people believe this discourages the young from taking part in any sport themselves. Discuss this view and give your own opinion.				✓		1
5	Schools should only offer subjects that are beneficial to students' future career success. Other subjects, such as music and sports, are not important. To what extent do you agree or disagree?						0
6	In the past, shopping was a routine domestic task. Many people nowadays regard it as a hobby. To what extent do you think this is a positive trend?						0
7	Some people think that public health is a responsibility of the government, while others believe that individuals should be responsible for their own health. Discuss both these views and give your own opinion.	✓	✓	✓		✓	4
8	More and more young people use the Internet to socialize. Do you think this is a positive or a negative development?						0
9	In some educational systems, children are required to study one or more foreign languages. In others, foreign language study is not a requirement. What are the potential benefits of foreign language study? Do you think foreign language study is an important part of education?	✓			✓	✓	3
10	A growing number of people rely on restaurants and convenience food (frozen food and packaged meals) rather than home-cooked food to supply most of their meals. What are the advantages and disadvantages of eating this way?		✓		✓		2
11	For more and more people, wearing fashionable clothes is becoming important. Is this attitude to wearing clothes positive or negative development?		✓				1
12	Some families think the best way to take care of their ageing parents is to care for them at home. Others believe that it is better for their parents to live in a special home for the elderly. Discuss both these views and give your opinion.			✓			1
13	Research shows that many business meetings and training are increasingly taking place online. Do the advantages of this outweigh the disadvantages? .					✓	1
14	In some places, money earned from tourism has become an important part of the national economy. What are the advantages and disadvantages of relying on tourism as a major source of national revenue?			✓			1
15	"Cooking at home is waste of time and energy because there are so many convenient outside food options that make life less stressful. To what extent do you agree or disagree? "						0
16	Some people say that physical education classes are an important part of a child's education. Others believe that it is more important to focus on academics during school time. Discuss both these views, and give your opinion.			✓			1
17	Using a cell phone while driving is dangerous because it causes the driver to become distracted. Therefore, cell phone use by drivers should be made illegal. To what extent do you agree or disagree?				✓		1
18	Some people think travelling abroad is a valuable experience for young people. Others think that it is a waste of time and money. Discuss both views and give your own opinion.	✓	✓				2

Questions 7, 9, 1, 2, and 3 were selected for further analysis as they received the highest number of votes from the expert panel.

1. Question Selection (Cont.)

Q No.	Questions
1	Some people think that public health is a responsibility of the government, while others believe that individuals should be responsible for their own health. Discuss both these views and give your own opinion.
2	In some educational systems, children are required to study one or more foreign languages. In others, foreign language study is not a requirement. What are the potential benefits of foreign language study? Do you think foreign language study is an important part of education?
3	Traffic congestion is a growing problem in many of the world's major cities. Explain some possible reasons for this problem, and suggest some solutions.
4	Some people believe that children learn better when they are placed in classes with children of similar academic abilities. Others believe that children learn better when they are in classes with children representing a diverse range of academic abilities. Discuss both these views and give your opinion.
5	Some people argue that it is more important to have an enjoyable job than to earn a lot of money. Others disagree and think that a good salary leads to a better life. Discuss both these views and give your own opinion.

Table 2: List of Selected Questions

2. Response Generation by AI Models And Students

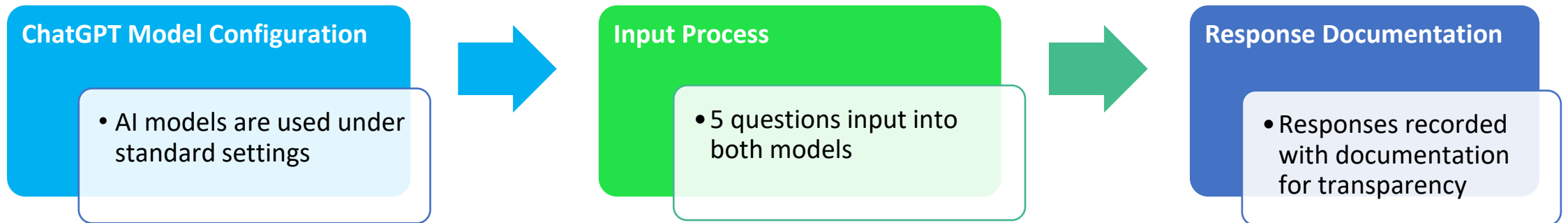


Figure 7: Response Generation/Creation Process

- Using AI models with default configurations.
- Each question was entered into both models without additional instructions or modifications.
- Responses were recorded and labeled for evaluation.
- Also, student participants wrote the answers to all the questions

3. Response Generation by AI Models and Students

Response Analysis for ChatGPT-3.5, ChatGPT-4o, Gemini, DeepSeek and students.

Question No.	Words Count					
	GPT-3.5	GPT-4o	DeepSeek	Gemini	Student-1	Student-2
Question 1	351	419	386	409	332	489
Question 2	326	444	394	364	287	368
Question 3	356	439	248	412	240	344
Question 4	404	392	288	363	301	313
Question 5	396	406	260	437	335	310

Table 3: Summary of the Answers

4. Evaluation of Responses

Formation of Evaluation Panel

	College Name	Teacher Name	Designation
1	Jashore Government City College, Jashore	Zakir Hossain	Head of English Department
2	Govt. M M College, Jashore	Md. Ikhtiar Uddin	Associate Professor, English Department
3	Cantonment College, Jashore	Zohirul Islam	Head of English Department
4	Daud Public School and College, Jashore Cantonment	Md. Rayhan	Senior Lecturer in English
5	BCMC College of Engineering and Technology, Jashore	Md. Abdullah Al Manun	Senior Lecturer in English
6	Jashore Polytechnic Institute	Esmot Ara	Senior Lecturer in English
7	Jashore College, Jashore	Md. Kamrul Hossain	Lecturer in English
8	Narail Govt. Victoria College, Narail	Md. Moklesur Rahman	Associate Professor, English Department
9	Abdul Hye City College, Narail	Biddut Roy	Lecturer in English
10	Jashore Government College, Jashore	Md. Ikbal Kabir	Senior Lecturer in English

Table 4: Expert Evaluators

4. Evaluation of Responses (Cont.)

Assessment Process

- To avoid potential bias, the teachers were not informed that AI models generated the writing samples.
- Teachers were informed that responses were written by students to ensure that the assessment is completely unbiased.
- A panel of 10 experienced English teachers evaluated the responses.
- Responses were scored out of 10 based on contextual accuracy and well-structure.

Evaluation Criteria

- Answer on Topic / Contextual Accuracy:**
 - Yes:** Answer accurately matches.
 - No:** Answer does not matches.
- Syntax Quality:** Measures grammatical accuracy, sentence structure, punctuation, and coherence.
 - High:** Fluent and well-organized writing.
 - Medium:** Adequate structure with minor errors
 - Low:** Writing lacks clarity or organization.

Overall Score: Each response was scored out of 10

English Writing Answer Sheet

Candidate Name: Candidate ID:

Group: Date:

Examiner Evaluation

Answer On Topic: Yes No

Syntax Quality: High Medium Low
(Sentence Structure, Grammar, Punctuation, and Word Order)

Score / Mark: Out of 10

Question:

Some people think that public health is a responsibility of the government, while others believe that individuals should be responsible for their own health. Discuss both these views and give your own opinion.

Answer:

The debate over whether public health should be the responsibility of the government or individuals is a long-standing one. Both perspectives have valid arguments, and a balanced approach might be the most effective solution.

On one hand, those who argue that public health is the government's responsibility emphasize the importance of collective action and the role of the state in ensuring the well-being of its citizens. Governments have the resources and authority to implement large-scale health initiatives, such as vaccination programs, public health

24

Figure 8: Answer Sheet (Corrected by a Teacher)

Evaluation Results

Syntax quality Evaluation Results of ChatGPT-3.5, ChatGPT-4o, DeepSeek, Gemini, and Students

Institution and Educator	Question 1						Question 2					
	ChatGPT 3.5	ChatGPT 4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)	ChatGPT 3.5	ChatGPT 4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)
Jashore Government City College, Jashore	High	Medium	Medium	Medium	High	High	High	High	High	Medium	Medium	High
Govt. M M College, Jashore	High	High	High	High	High	High	High	High	High	High	Medium	High
Cantonment College Jashore	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Daud Public School and College, Jashore Cantonment	Medium	Medium	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	High	High
BCMC College of Engineering and Technology	Medium	Medium	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	Medium	Medium
Jashore Polytechnic Institute	Medium	High	Medium	Medium	Medium	High	Medium	Medium	Medium	Medium	Medium	High
Jashore College, Jashore	Medium	High	Medium	Medium	Medium	Medium	High	Medium	Medium	Medium	Medium	Medium
Narail Govt. Victoria College, Narail	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Abdul Hye City College, Narail	Medium	Medium	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	Medium	High
Jashore Government College	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium

Table 5: Syntax Quality Result (Part 1)

Evaluation Results

Syntax quality Evaluation Results of ChatGPT-3.5, ChatGPT-4o, DeepSeek, Gemini, and Students

Question 3						Question 4						Question 5					
ChatGPT 3.5	ChatGPT 4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)	ChatGPT 3.5	ChatGPT 4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)	ChatGPT 3.5	ChatGPT 4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)
Medium	High	High	Medium	Medium	Medium	Medium	High	Medium	Medium	High	High	High	Medium	Medium	Medium	High	Medium
High	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High
Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
High	High	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	High	High	Medium	Medium	High	High
Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	Medium	Medium	Medium	Medium
Medium	Medium	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	High	Medium
Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	High	Medium	High	Medium	Medium	Medium	Medium	High
Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Medium	Medium	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	High
Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium

Table 6: Syntax Quality Results (Part 2)

Evaluation Results

Scores Evaluation Results of ChatGPT-3.5, ChatGPT-4o, DeepSeek, Gemini, and Students

Institution and Educator	Question 1						Question 2					
	ChatGPT 3.5	ChatGPT 4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)	ChatGPT 3.5	ChatGPT 4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)
Jashore Government City College, Jashore	8	7	7	7	8	8	8	8	8	7	7	8
Govt. M M College, Jashore	8	8	9	9	9	8	8	9	9	9	8	9
Cantonment College Jashore	6	5	5	5	6	6	6	7	5	6	7	7
Daud Public School and College, Jashore Cantonment	8	7	8	7	8	8	8	9	7	8	9	9
BCMC College of Engineering and Technology	8.5	7	7	7	8	8	8.5	7	7	6	8	8
Jashore Polytechnic Institute	7	8	7	7	7.5	8	7.5	8	7.5	7	7	8
Jashore College, Jashore	6	7	7	6	7	7	7	7.5	6	7	7	7.5
Narail Govt. Victoria College, Narail	6.5	6	6	6	6.5	6	6	7	6	6	7	6
Abdul Hye City College, Narail	7	7	6	6	7	7	6	8	7	6	7	8
Jashore Government College	5	5.5	5	5	6	6	6	6	6	5.5	5	6

Table 7: Score Evaluation Result (Part 1)

Evaluation Results

Scores Evaluation Results of ChatGPT-3.5, ChatGPT-4o, DeepSeek, Gemini, and Students

Question 3						Question 4						Question 5					
ChatGPT 3.5	ChatGPT 4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)	ChatGPT 3.5	ChatGPT 4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)	ChatGPT 3.5	ChatGPT 4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)
7	8	8	7	7	7	7	8	7	7	8	8	8	7	7	7	8	7
8	9	8	9	8	9	8	9	9	9	9	8	9	8	8	9	8	8
7	7	6	7	7	7.5	7	7.5	7	7	7	7.5	6	6	6	6	6	6.5
9	9	8	8	8	8	7	8	8	7	7	8	9	9	8	8	9	9
9	8.5	8	8	8	8	7	8	6.5	7	7	7	6.5	7	7	7	7	8
8	8	7	7	7.5	8	7.5	8.5	7	7	7.5	7	7	8	7	7	7.5	7.5
6.5	7	6.5	7	7	7	6	6.5	6	6	7	7	8	7	7	6	7	8
6.5	7	6	6	7	7	6	7.5	7	6	7	7	7	7	6.5	6.5	7	7
7	7	6	6	7	7	7	8	6	6	7	7	6	7	6	6	7	7
5	6	5	6	5.5	5.5	5	6	5	5	5.5	6	5	5.5	5	5	6	5.5

Table 8: Score Evaluation Result (Part 2)

Comparative Analysis

Question	ChatGPT-3.5	ChatGPT-4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)
Question 1	70	67.5	67	65	73	72
Question 2	71	76.5	68.5	67.5	72	76.5
Question 3	73	76.5	68.5	71	72	74
Question 4	67.5	77	68.5	67	72	72.5
Question 5	71.5	71.5	67.5	67.5	72.5	73.5
Overall Avg.	70.6	73.8	68	67.6	72.3	73.7

Table 9: Comparison of Total Scores

Comparative Analysis

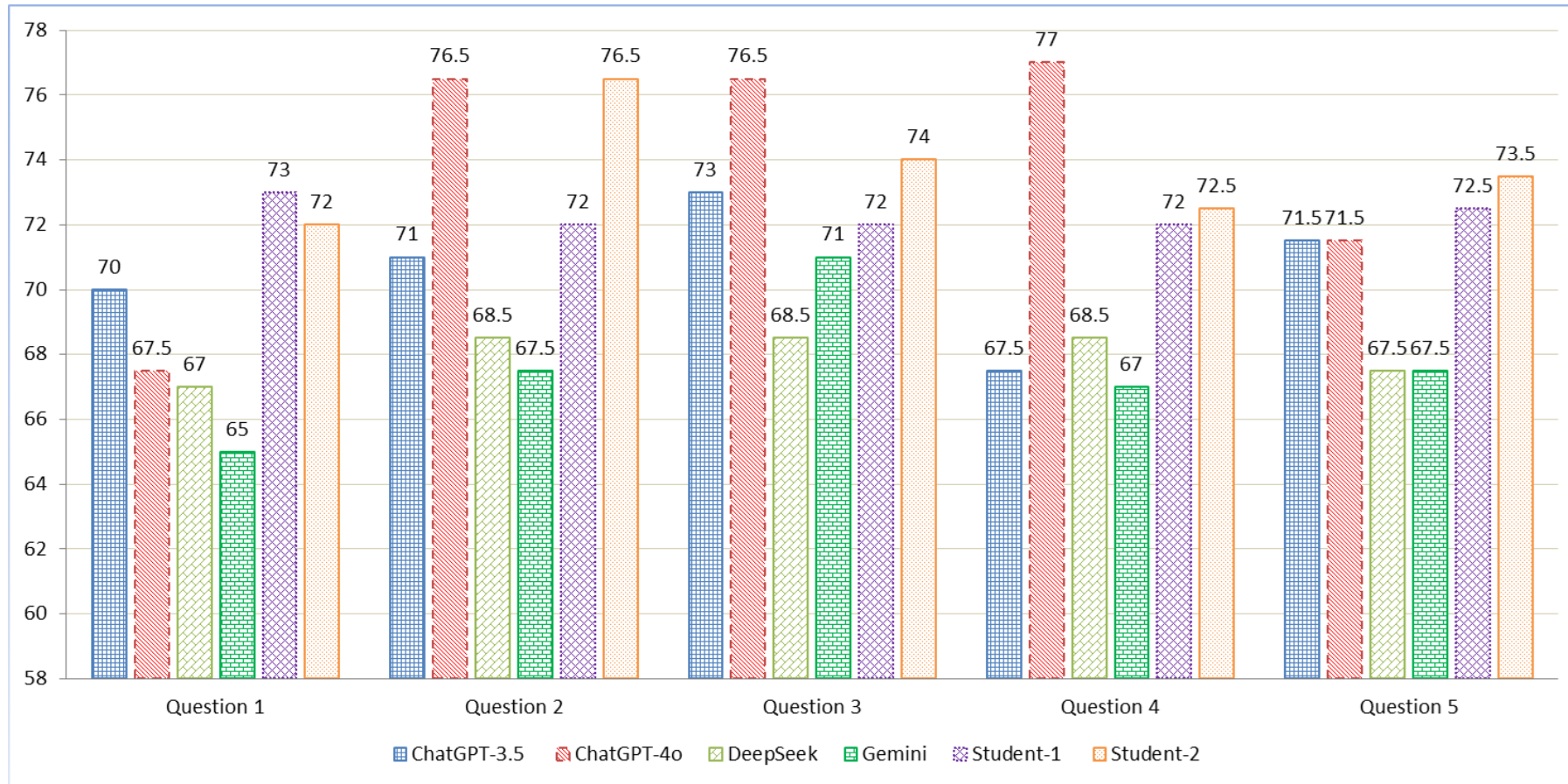


Figure 9: Comparison of Scores

Comparative Analysis (Cont.)

Question Number	ChatGPT 3.5	ChatGPT 4o	DeepSeek	Gemini	Student-1 (MM)	Student-2 (JUST)
Question 1	7	6.75	6.7	6.5	7.3	7.2
Question 2	7.1	7.65	6.85	6.75	7.2	7.65
Question 3	7.3	7.65	6.85	7.1	7.2	7.4
Question 4	6.75	7.7	6.85	6.7	7.2	7.25
Question 5	7.15	7.15	6.75	6.75	7.25	7.35
Overall Average	7.06	7.38	6.8	6.76	7.23	7.37

Table 10: Average Scores

Comparative Analysis

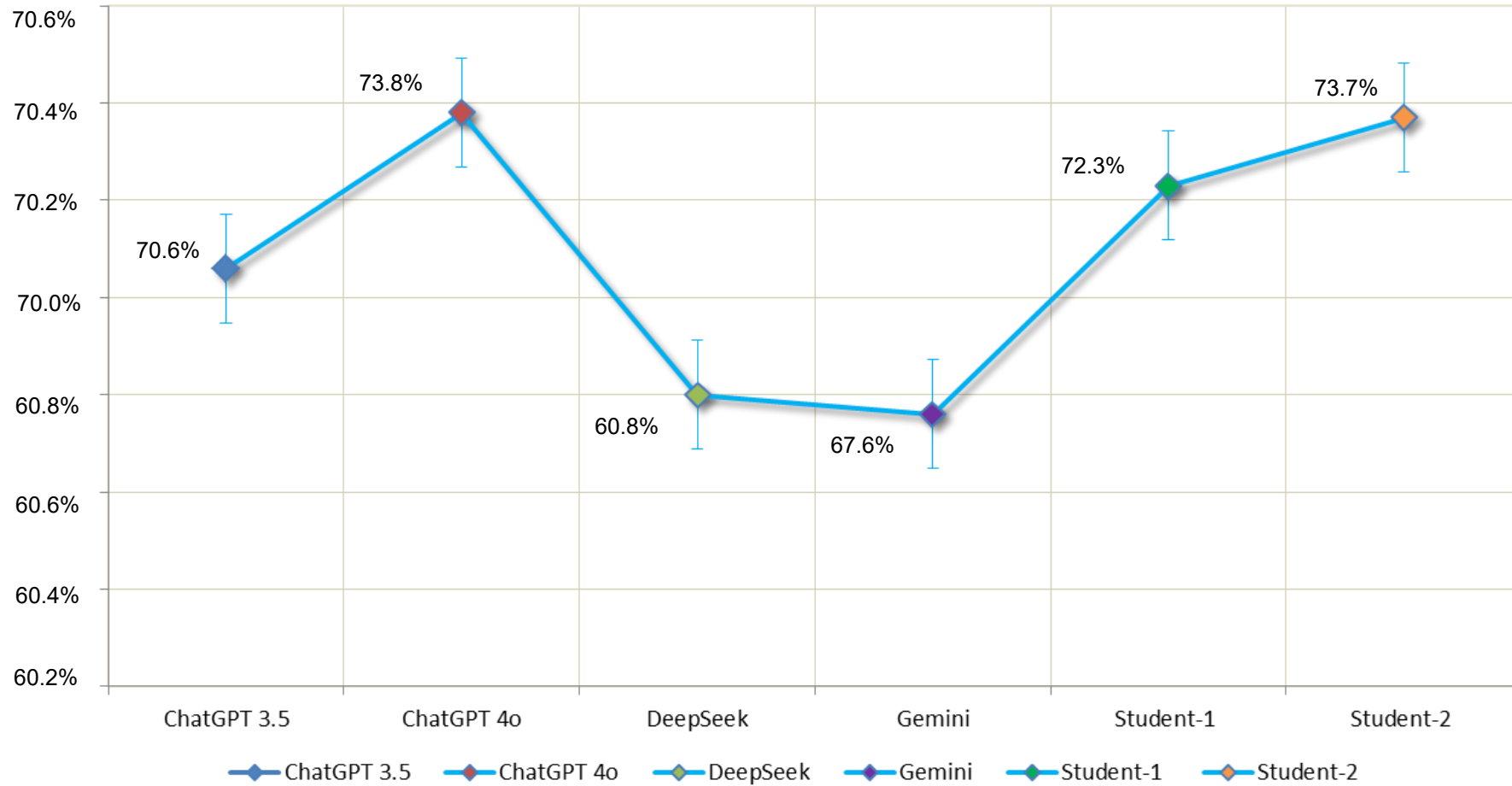


Figure 10: Average Scores Using the Studied Tools

Key Findings

- ❑ AI can write well
- ❑ But AI cannot yet write like a human with full depth
- ❑ AI shows strong syntax but lacks depth and reasoning
- ❑ Students outperform AI in critical thinking and originality
- ❑ 73.8% is good, but far from 100%

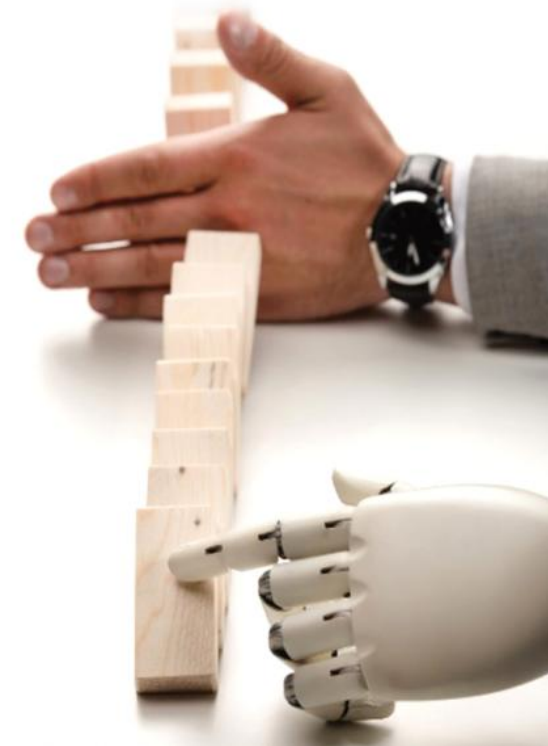
Why Humans Still Matter

- ❑ Emotional intelligence
- ❑ Creativity
- ❑ Critical judgments
- ❑ Ethical reasoning
- ❑ Real-life knowledge
- ❑ Ability to understand context deeply



Responsible Use of AI

- Verify AI-generated content
- Combine human & AI strengths
- Use AI for assistance, not replacement
- Keep human evaluation in the loop



My Message, “Use AI—but only after thorough verification and validation”

Thank You!

Any Question



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