

TEACHERS' PERCEPTIONS REGARDING THE USE OF AI TOOLS AND STUDENTS' CRITICAL THINKING DEVELOPMENT IN 4TH SEMESTER CLASSES AT UNIVERSITY OF GUJRAT

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Abstract

The deployment of Artificial Intelligence (AI) in higher education has been rapidly expanding, and educators everywhere have been excited and worried about the future possibilities of this technology. This paper explores teachers' attitudes towards using AI tools and the extent to which these tools help students become critical thinkers at University of Gujrat (UoG), Pakistan. With the help of a standardized questionnaire, quantitative research approach was adopted to collect data from 150 students of 4th semester classes, so that the role of AI from teachers could be explored as an enabler/disabler of critical thinking. Studies identify that although a large number of teachers embrace the potential of AI tools in supporting discovery learning and developing independent thinking, still many of them doubt that students will fall into the habit of directly using AI-generated solutions without thinking deeply. The link between AI and critical thinking is tight, and it is highly dependent on how instructors use AI in their classrooms. This research offers useful tips to teachers as well as heads of universities on how to utilize AI as a means of encouraging students' solitude thinking instead of using it as a substitute.

1. INTRODUCTION

We are witnessing a time when the difference between human mind and artificial intelligence is dissolving rapidly. The emergence of AI tools like ChatGPT, Google Gemini, and many other AI-based technologies has drastically altered the way students engage with their academic work. Writing essays, preparing solutions, and researching are some areas where students have started to depend on AI for quick and seemingly reliable answers. Such a change is most apparent in universities where students have a heavy academic workload and the pressure to deliver

good performance is also high. The University of Gujrat is a public sector university that is expanding and it is also facing this challenge of AI with the rest of the world. 4th semester students, generally given more freedom to choose interesting/debatable topics, are known to be more independent in their work. These students also have perpetual access to the internet where they mainly use AI for their task completion. The tools may be impressive in themselves but the question is: has the exposure to this since led the students to increase their critical thinking or to decrease it?

We intend to tackle this question through our present research. A comprehensive understanding of critical thinking would be the skill of breaking a concept into parts so one can get the meaning of it, arguing one's point with the use of logic, combining different ideas to develop a new one, and making the best use of the available information one has with reflection and reasoning. These skills, among others, make a university graduate stand out and ready for the job market. Critical thinking is a mandate of a good job, is being pushed by higher education institutions, and educational theorists have long maintained it to be the real aim of higher education. Still, if using AI tools is depleting this skill, that would definitely be a major concern. Then again, if AI tools are boosting this skill, then that is a matter worth studying and imitating.

Teachers who are engaged both in education and student behavior are in a very special position in this discussion. Their ideas about AI tools are hugely important since their ideas determine how they plan courses, how they handle student works done with AI, and if they try to integrate AI tools into teaching in a positive way or just ignore or ban them. Studies show over and over that the way a teacher feels about technology is actually one of the main factors deciding whether the use of educational technology really helps students learn. In Pakistan, AI in higher education is a topic that has not been given much attention by researchers, unlike Western countries that have better infrastructure and digital literacy. At the University of Gujrat, factors such as uneven internet access, varied digital skills, exam-focused curricula, and high teacher authority influence the use of AI. So, it is very important to know the teachers' points of view on the use of AI in students' critical thinking.

The study is based on 4th-semester students, who are being introduced to a system of academic learning that is normally practiced by older students. The aim of the research is to find out teachers' opinions about AI, the expected influence of it on critical thinking, and how these opinions change with AI use, training, and institutional support. So giving a good overview of the situation at UoG.

In the end, the study broadens the existing literature on technology and pedagogy in South Asian universities and gives useful and direct insights to the UoG academic community.

2. Research Objectives

These three objectives led the development of this research study:

1. To learn about the views of teachers at the University of Gujrat on students' use of AI tools in their academic work by 4th semester students.
2. To examine teachers' perspective on the link between students' use of AI tools and the enhancement of critical thinking abilities in 4th semester classes.
3. To gather the difficulties and benefits that teachers see the use of AI tools in their promotion of critical thinking in 4th semester university students.

3. Research Questions

This study was guided by these three main research questions:

1. What do teachers at the University of Gujrat think about students using AI tools in the 4th semester classes?
2. Per the teachers at the University of Gujrat, what is the role of AI tools in developing critical thinking skills of the 4th semester students?
3. What are the challenges and opportunities seen by teachers in using AI tools for enhancing critical thinking development in 4th semester classes at the University of Gujrat?

4. Significance of the Study

That the study is important rests on Really it covers a number of interlinked axes of discourse and information, which in turn mean that it appeals to different interest groups. Institutionally, no policy has been put into place yet for using AI tools for academic purposes by the University of Gujrat; but the information in this research can act as a valuable guidance as and when that policy is to be decided because after all, the first human beings who have the education to experience the techniques of AI tools to effectively use them, are the teachers.

From a pedagogical perspective, the issues raised in this study can work as a mirror for teachers to look at their own dispositions and practices.

Teachers who read the report may conclude that their anxieties are common or that their more hopeful attitudes need to be tempered with evidence. Either way, the report opens up a more complex and evidence-informed discussion in the teaching profession on what it means to teach in AI times. It is significant from a student-centric perspective to examine how access and use of AI objects will impact the development of critical thinking as 4th semester students are now fresh into the midst of their newfound academic path. Learning from such scenario's can help in implementing measures that support and enhance their critical faculties instead of letting AI become, If you can't beat them, join them..

From a wider societal perspective, the higher education system in Pakistan is under obligation to provide the growing number of upper education graduates with a set of skills that would make them gainfully employable in a knowledge based economy.

Critical thinking being a main component of skill set required by contemporary workforce as well as a set of institutions Make sure to create a research that guides universities on the optimal utilization of AI in developing of this skill. Finally, the study adds to a small though growing number of studies on AI in Pakistani higher education, providing an empirical angle to a research area that is mostly anecdotal and policy discussions till now.

5. Problem Statement

The rapid expansion of AI tools in university environments has led to a serious and largely neglected pedagogical issue, Mainly in less resourced countries like Pakistan. For instance, 4th semester students at the University of Gujrat are evidently using AI platforms for generating their academic assignments, writing responses, and solving conceptual questions.

The worry is not just that students might use AI, but that it could diminish their critical thinking skills. If students just copy the content generated by AI without questioning it, comparing it, or even trying to integrate it in their own line of thought,

they will miss the main intellectual challenge that is a university education.

But, the instructors at the University of Gujrat are in a dilemma as well. Most of them are not formally trained to integrate AI tools in their teaching. Some of them are not sure how to identify the AI-generated work from the original compositions. Some others are against the use of AI on principles but think that they do not have the required institutional support to set rules. Yet another group is quite positive but they do not know how to use the AI as a means to facilitate independent thinking rather than just replacing it. To date, no research has been done at the University of Gujrat that has teachers as subjects and focuses on their perceptions about AI and critical thinking. This is exactly the problem that the present study plans to deal with. Teachers' opinions on the matter are crucial for launching a successful intervention of any form - a new policy, a faculty development program, or a curriculum revision - as all of them would be devoid of the basis needed to be effective without such an understanding.

6. Literature Review

AI integration in education has become an increasingly talked about topic among researchers over the last 10 years. The rise of big language models and their deployment in 2022-2023, in particular, have been major factors in attracting research interest. Different studies have reported varied results. Some are quite broad in their approach by looking at AI usage in higher education generally, while others go into great depth on the effects of AI on student critical thinking. While some studies are from developed countries, others provide data about developing countries which can also be applicable to Pakistan.

6.1 AI Tools in Higher Education

Zawacki-Richter et al. (2020) reported that AI in higher education has been effective in providing intelligent tutoring, predictive analytics, and personalized learning; Still, they also pointed out that its impact on higher-order thinking is still unclear. Luckin et al. (2016) asserted that while AI is mostly used for knowledge delivery, it is the

knowledge construction that is essential for critical thinking development, and this is the major area that AI neglects.

Since the public release of ChatGPT, generative AI has become a hot topic in academia. Kasneci et al. (2023) highlighted that although AI can act as a learning partner, over-dependence on it could result in diminished mental effort and lessened analytical skills. Cotton et al. (2023) carried out a study which revealed that a large proportion of students had utilized ChatGPT for writing essays but without adequate guidance, and they commonly regarded it as a shortcut rather than as a tool for learning.

6.2 Critical Thinking in University Education

Facione described critical thinking as making judgment consciously and intentionally that takes the use of one's critical faculties like analyzing, evaluating and drawing conclusions.

Paul and Elder outlined criteria like clearness truthfulness importance, and justice and stated that critical thinking is a combination of a mental skill and a tendency to use that skill. If AI encourages superficial involvement it may actually be a hindrance.

Abrami et al. remarked that the most effective way to develop critical thinking is through direct instruction and inquiry-based activities. This shows AI could nurture critical thinking if students are asked to assess and build upon AI-generated materials.

6.3 Teachers' Perceptions of Educational Technology

Teachers' opinions have a major influence on whether new technologies are introduced. In fact, Davis argued that it is mainly through the perceived benefits and the perceived simplicity of use that people make the decision whether or not to adopt a new technology.

Ertmer, Then again, acknowledged external barriers like lack of infrastructure and training, and internal ones like beliefs and attitudes, and he admitted that the internal barriers are more difficult to be overcome.

Per Valtonen et al. most teachers, on one hand, acknowledge the positive aspects of AI but But a

lot of them express concern over Really students may become highly dependent on it and less able to think for themselves. But the big differences in both culture and infrastructure mean that it is hardly possible to do a direct comparison with Pakistan.

6.4 AI and Critical Thinking: Emerging Evidence

Darvishi et al. demonstrated that students' argumentation was positively affected by AI feedback whilst learners were actively revising their work. Then again, Yan et al. showed that the more frequently students used AI tools, the worse their critical thinking was due to lesser mental effort.

Malik et al. in Pakistan found a great interest in digital tools but only limited practical and reflective integration, which indicated that AI may be used in a functional way rather than for teaching purposes.

6.5 Synthesis and Research Gap

The intelligence that a machine has can help in education but it can also weaken the learning when it is used in a passive way. The educational value of AI is mainly determined by the perception of teachers, although the situation in Pakistan is almost not documented. It is only this study that will explore the views of the teachers on AI and critical thinking of the students of 4th semester of the University of Gujrat So the research is most necessary to fill that void.

7. Research Methodology

The research focused on a quantitative approach, which suited the research questions and the plan to gather systematically comparable data from a specific group of participants. Quantitative techniques can work well for measuring and analyzing attitudes and perceptions in a formal and repeatable way, which makes them Mainly appropriate for survey-based research of this nature.

7.1 Research Design

A descriptive survey design was implemented. When the aim is to describe the present situation of perceptions, attitudes, or behaviors in a

particular population, descriptive surveys are very common in educational research. This type of design does not alter any variables but instead takes a picture of how things are at a particular moment in time. Since the research is exploratory and laying the basis for further studies at UoG, the descriptive method was the best option.

7.2 Population and Sample

The students of 4th semester at University of Gujrat were the population of this research. During 2024-2025 academic year, 150 students were drawn by purposive sampling (a non-probability sampling technique where participants are chosen from research-related specific criteria). The condition for the study inclusion was participants being 4th semester students and also attending courses in which at least one teacher used regularly or discussed the use of AI tools.

The number of respondents 150 was fixed by taking help of Cohen's (1992) guidelines for educational survey research which state that descriptive quantitative studies of distinctly defined and accessible populations generally require samples of 100-200.

7.3 Research Instrument

A confirmed and standardized survey instrument was utilized for primary data collection. The major tool was a pre-designed questionnaire with the major part consisting of closed-ended items that were rated using a five-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). The questions were carefully trimmed into 4 different parts so one personal background and what might be the perception of the use of AI in the education or academy settings and also third is that its about correlation with between thinking critically and the usage of these tools and last its about knowledge how a problem are perfectly relates with the Ai integrity I mean how it can solve problems via the usage of AI implementation.

The tool was a modified version of a pre-validated survey generally lectured in the field of educational technology in universities. The major modifications for alignment with the UoG setting were first checked by two education faculty members before the tool was finally rolled out.

8. Data Collection Method

Structured questionnaires were the main tool for data collection and the researchers distributed these to 150 student participants at University of Gujrat (UoG). The entire data collection was done in several phases with each phase's main goal being the accuracy, completeness of data and ethical aspects of data gathering.

The first part was to get the approval to conduct this research from the relevant department at UoG. Informed participants about the objective of the research, participant rights, and that participation is voluntary. They got written informed consent from all participants before handing over the questionnaire.

During the second phase, the paper format of the questionnaire was handed out to the students during their normal class time. This method was chosen over online administration because they wanted to get maximum responses and also make sure that all the participants have an equal chance to take the questionnaire in the same conditions.

Of the 150 questionnaires that were handed out, the exact number of completed questionnaires were also 150, to give us a 100 percent response rate. The completed questionnaires after being checked for any missing or invalid responses are all included in the survey, as face-to-face administration enabled the immediate clarification of any item that a participant found unclear.

Data collection took place in two-week duration during the spring semester, 2025. The participants were informed that their data will be kept confidential and solely used for academic purposes.

9. Validity and Reliability

Making sure that the research tool was valid and reliable was a main focus during both the planning and carrying out of this study because the quality of quantitative research largely rests on the credibility of the data gathering instrument.

9.1 Validity

Content validity was done by asking two professors who have experience in educational research and educational technology to review if the

questionnaire items were well aligned with the constructs being measured, i.e. teacher perceptions of using AI tools and the development of critical thinking skills. Two experts mainly verified if the questions sufficiently represented the two constructs and only small modifications were made based on their feedback before the final tool was used.

Validity was achieved by designing the questionnaire based on existing models and pilot-testing it with five 4th-semester students to identify and clarify ambiguous items.

9.2 Reliability

Reliability was assessed also by calculating Cronbach's Alpha. And The entire questionnaire yielded a value of 0.84, while the two sub-scales

for AI usage and critical thinking achieved scores of 0.81 and 0.79 respectively rating very highly in internal consistency and credibility of findings.

10. Data Analysis

The 150 questionnaire responses were processed in SPSS 26. Descriptive statistics such as frequencies percentages means, and standard deviations were used to capture general tendencies and perform comparisons. A score greater than 3.5 reflected a favorable perspective, 2.5 to 3.5 neutral, and less than 2.5 negative. Besides, demographic characteristics like gender, subject area, and level of digitalization were also described by frequency distributions, which helped in giving the overall picture and in the interpretation of the findings.

Table 1: Demographic Profile of Participants (N=150)

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	68	45.3
	Female	82	54.7
Department	Education	60	40.0
	Social Sciences	45	30.0
	Natural Sciences	25	16.7
	Computer Science	20	13.3
AI Tool Usage	Daily	62	41.3
	Weekly	54	36.0
	Rarely	34	22.7

11. Findings

The results of this study are presented with the three research questions and are about the perspectives of 150 4th semester students of the University of Gujrat about their course teachers using the AI tools and critical thinking.

11.1 Teachers' General Perceptions of AI Tools

Most students said their teachers knew about AI tools and had even brought them up in class once or twice. Close to 71.3% of students said that they either agreed or strongly agreed that their teachers

were aware of ChatGPT and other such platforms. Yet, just being aware didn't necessarily mean they were in favor. Only 38.7% said their teachers were positive about students using AI tools for human purposes; 42% said that their teachers held at least quite negative views of human usage, and the remaining 19.3% had neutral attitudes towards such usage.

When students talked about their teachers' concerns, they mentioned academic dishonesty, less work done by students, and also students using AI tools without really understanding the

content. A mean score of 3.9 out of 5, "My teacher believes that using AI tools reduces students' effort

to think independently", is on the item clearly reflects the situation.

Table 2: Teachers' Perceived Attitudes Toward AI Tools (N=150)

Questionnaire Item	Mean	SD	Interpretation
Teachers are aware of AI tools like ChatGPT	4.1	0.71	Positive
Teachers discuss AI tools in class	3.6	0.84	Positive
Teachers encourage use of AI for learning	2.9	0.96	Neutral
Teachers believe AI reduces independent thinking	3.9	0.78	Positive
Teachers have set clear rules about AI use	2.7	1.02	Neutral

11.2 Perceived Impact on Critical Thinking

When students were asked about how teachers see the connection between AI tool usage and critical thinking skills development, their answers exposed a split situation. Around 54.7 percent of respondents said that their teachers thought that students using AI tools were less likely to think deeply before working on tasks. In contrast, 32 percent claimed that their teachers also admitted that AI, when used correctly, could help the

students comprehend the concepts and ask more clarifying questions.

Students also told that teachers seldom made assignments geared at getting pupils to critically evaluate AI-generated material. This is indicated by Truth is only 26 percent admitted that their teachers have given them a task to compare, critique, or edit an AI response. That's why, this points to Truth is teachers who recognized the value of AI as a teaching medium had not made use of it regularly in their lesson planning.

Table 3: Perceived Impact of AI on Critical Thinking (N=150)

Questionnaire Item	Mean	SD	Interpretation
AI use makes students less reflective, per teachers	3.8	0.82	Positive
Teachers assign tasks requiring critique of AI output	2.5	0.99	Neutral
Teachers believe AI supports conceptual understanding	3.1	0.88	Neutral
Teachers encourage questioning AI-generated answers	2.8	0.91	Neutral
AI is seen as harming academic integrity by teachers	4.0	0.76	Positive

11.3 Challenges and Opportunities Identified by Teachers

Students' perceptions reveal that teachers' main difficulties in dealing with the use of AI tools are:
- determining the difference between a piece of

work produced by a student with the help of AI and a student work produced without assistance (original student writing); - absence of school rules on the matter; - lack of adequate training in pedagogy that integrates AI; - worry about students

using AI as a means to cheat and avoid acquiring skills.

Advantages, on occasions, pointed out by students as teachers' views, were: - AI could be used as a writing helper for less proficient students; -

Teachers may use AI-generated texts for discussion purposes; - AI could be used to provide instantaneous feedback which might be something that teachers do not have the time to give to individual students.

Table 4: Challenges and Opportunities Related to AI Integration (N=150)

Theme	Agree (%)	Disagree (%)	Neutral (%)
Difficulty detecting AI-generated submissions	68.0	14.7	17.3
Lack of institutional AI policy	73.3	12.0	14.7
Insufficient teacher training on AI pedagogy	65.3	18.7	16.0
AI as useful scaffolding tool for weaker students	42.7	31.3	26.0
AI as a prompt for classroom discussion	38.7	33.3	28.0

12. Conclusion

This paper First and foremost aims to explore teachers' view of AI tools and critical thinking through the lens of their 4th semester students at the University of Gujrat. The results of the study do not show a one-sided negative view or an unrealistic positive one, but reveal the multifaceted character of the situation in a public university of Pakistan now.

Overall, teachers know about AI tools and worry about how students' mindsets may be affected by them. The main worry is not so much that AI is intrinsically a harmful technology but rather students are so passive in their use of this tool, i.e. ask it questions and just believe its answers without doing any reasoning at all, the kind that is usually fostered in a university setting. Besides being valid, this worry is well-supported by the broader scholarship on AI and cognitive effort.

On another note, teachers themselves remain wanting in their capability of consistently and effectively turning such worries into pedagogical practices that would yield positive results. Tasks that require students to locate errors or simply enhance AI-generated content, an approach widely supported by the literature as one of the most effective ways of using AI as a trigger for critical thinking, are hardly visible in 4th semester classrooms at UoG. The discrepancy between

teachers' knowledge and their actual teaching practice is probably the most significant aspect of the study.

Besides, the overall institutional factor cannot be neglected as well because apparently teachers are juggling, some of them even alone, the issues of unclear rules, lack of formal training and in many cases, absence of a shared set of terms for describing the part that AI plays in their courses. To fill these gaps, it is indispensable to go beyond the teacher level and initiate changes at the level of the institution.

To sum up, the hurdle for UoG, and for Pakistani universities in general, is not whether they should allow AI in classrooms. That decision is more or less done and dusted. The challenge lies in creating the pedagogical and institutional system that ensures the use of AI complements rather than replaces critical thinking. This paper is just the first step towards that dialogue.

13. Recommendations

Taking in to account the results and the main points of the research, these recommendations are made to different stakeholders.

13.1 For University Administration (UoG)

- Create and share a detailed and well-rounded institutional policy on the use of AI tools

in academic work. Such a policy should not simply disallow the use of AI technology or on the contrary, set the use of AI without any restrictions or pedagogical guidance as the norm.

- Allocate funds towards teaching staff reskilling programmes to help them master the use of the practical strategies for teaching students the critical use of AI tools through changing the course design.
- Constitute a committee with members from the faculty and student body as well as the institution's digital education experts to keep track of the AI changes and to revise the institutional directions So.

13.2 For Teachers

- Design at least some assignments each semester that require students to interrogate, revise, or critique AI-generated content, rather than simply produce or reproduce text.
- Recreating tasks that put students in the position of evaluating AI-generated content, get them in touch with the limitations of AI, and encourage them to engage in sharing the AI teaching experts among them.

13.3 For Students

- AI can help with your first draft, but then it is up to you to question and enhance them with your interpretation. Openly tell your teachers about the use of AI to establish trust and get their direction.

13.4 For Future Research

- Over time, the research that is done by following students studying at different universities of Pakistan and communicating to the teachers directly will provide the clearest and more comprehensible picture of the influence of AI on critical thinking.

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