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FROM COGNITIVE ASSISTANCE TO INTELLECTUAL DEPENDENCE: A QUALITATIVE STUDY OF AI AND METACOGNITIVE SKILLS IN NORTH KASHMIR

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ABSTRACT:

The spread of Artificial Intelligence (AI) represents a Fordist paradigm shift in the cognitive sphere, promising unprecedented efficiency through the automation of mental labour (Crawford, 2021). It is sometimes presented as an obligatory foundation of current digital literacy, rather than a choice for education. Such a fast integration, however, requires a critical analysis of its unintended effects on basic human capabilities. The present qualitative study examines the effect of AI dependence on the metacognitive abilities, such as creativity, critical thinking and self-reliance of teachers and learners. Based on the results of interactions and observations held in three educational institutions of North Kashmir, the study found that there is a widespread and yet little-recognised overreliance on AI tools. Respondents tended to use AI to obtain information and complete tasks with insufficient knowledge of how it works, a tendency that correlates with automation bias (Goddard, Byrne, and Fletcher, 2012). As a result, significant loss of self-confidence was noted; when asked to do something without the help of AI, users displayed rather high levels of self-doubt and unease, even though they had the inherent capacity to do the job. The study is summarised by concluding that although AI proves to improve the results of procedural processes and their efficiency, it simultaneously creates a cognitive trade-off. Even the convenience of outsourcing intellectual labour seems to deter the use of users' own creative and critical abilities, leading to a stagnation of individual intellectual development. The results of this study highlight the fact that there is an urgent need to come up with a pedagogical framework that allows for balancing the functional advantages of AI with intentional efforts to help develop and maintain vital human metacognitive abilities.

Keywords: Artificial Intelligence in Education, Metacognition, Critical Thinking, Automation Bias, Academic Dependency, Digital Pedagogy, Cognitive Trade-off, Teacher Self-Efficacy, North Kashmir.

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1. INTRODUCTION

Compared to other technological innovations that simplified physical labour, modern generative AI systems, both big language models and content-generating AIs, have reconfigured cognitive work as a whole. In the educational sphere, the use of AI is no longer a choice but a requirement, a prerequisite to being a part of what has been considered the Fourth Industrial Revolution (Schwab, 2017; UNESCO, 2025).

The main argument of this work is that, although the introduction of AI into learning environments is proven to boost the efficiency of procedures and the quality of the results produced, it also creates a subtle yet significant shift towards a loss of the metacognitive abilities that learning is supposed to be helping to develop. This process can be called the cognitive trade-off: short-term benefits in task achievements leading to the long-term stagnation of intellectual development, a levelling of the developmental curve that formal education has traditionally been meant to launch.

The empirical evidence available, although still new, gives greater and greater credence to these concerns. A survey of Indonesian tertiary students by Sitanggang et al. (2025) revealed that 61 per cent of the surveyed participants alleged that their creative abilities had diminished due to the continued use of AI, with 80.5 per cent admitting that they had developed a functional dependency. All these findings indicate that the issue concerns not a limited range of groups of people or types of institutions but a structural characteristic of modern AI-infused educational settings.

The current research is placed in a particular setting: three higher education institutions in North Kashmir. The history of educational provision in Kashmir has long been marked by a lack of infrastructure, an intermittent nature of institutional capacity and access to international networks of knowledge-conditions which may well be the predictors of relatively low rates of AI adoption. However, as we began to look, the picture was completely different: there was not only AI usage among educators and students, but it was so widespread and ingrained in everyday academic life.

Both teachers and learners showed regular use of generative AI systems in seeking information and creating content and solutions, but they showed a remarkably poor awareness of the systems they used. This trend follows the laid-down construct of automation bias, which was first described in the context of aviation and clinical decision-making (Goddard, Byrne and Fletcher, 2012; Parasuraman and Manzey, 2010), in which users have a preference to trust and rely on automated systems, despite evidence to the contrary or their capability to do so.

When asked to perform academic tasks without the use of AI, tasks which had been proven to be within their capability, as shown by later performance without aid, they showed significant discomfort, a sense of doubt and in some instances, an exuding of open hostility. This effect cannot be sufficiently attributed to a lack of skills; the participants had the necessary abilities but, due to prolonged cognitive offloading, no longer believed in their exercise. It is, in fact, this loss of epistemic self-trust- the belief that one's own mental activity is adequate and worthy- which is the ultimate price of unthinking AI adoption.

All these observations hint at a very basic issue, which is that current educational systems lack the means to solve this problem. What stands out most, however, is a lack of similar pedagogical dedication to holding onto and actively nurturing the metacognitive abilities that AI use could easily eclipse.

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Empirical studies of negative cognitive outcomes, especially those that utilise qualitative research methods that can help understand the lived experience of AI-dependent academic practice, are incredibly rare. Moreover, the context of the Global South, and especially the conflict-stricken, resource-starved educational setting, is virtually non-existent in the mainstream Western-dominated discourse. This research paper helps in filling the two gaps. This study was, therefore, informed by the following questions:

- What is the perception and practice of educators and students in North Kashmir institutions of higher learning on their use of generative AI tools in academia?
- Are there any signs of automation bias, cognitive offloading and the decline of metacognitive abilities such as creativity, critical thinking and intellectual self-reliance?
- What do participants feel about academic task performance in the absence of AI assistance, and in what way does this tell us about the relationship between AI dependency and self-efficacy?
- What do these findings mean pedagogically in terms of how frameworks can be developed to optimise the use of AI and the focused maintenance of metacognitive processes?

2. LITERATURE REVIEW

2.1 Metacognition, Cognitive Offloading, and the Fragility of Intellectual Skills

Later studies have found that metacognitive competence is not a stable personality characteristic but a system of skills that needs to be exercised to be maintained and developed (Veenman, Van Hout-Wolters, and Afflerbach, 2006; Dunlosky and Metcalfe, 2009). This is the principle of use-dependent plasticity (Lovden et al., 2010), which governs motor abilities as effectively as it does metacognitive abilities: abilities that are repeatedly practised expand; those that are not practised fade away.

An adaptive aspect of human thought is cognitive offloading (applying physical action or external aids to lessen mental cognitive load). Nevertheless, in revising the literature in the Google effect, Barr and colleagues (2025) differentiate between strategic and displacement offloading (wholesale-level replacement that avoids involvement of skills). This difference foreshadows the major issue of AI integration: those same instruments that could facilitate the effective completion of tasks, when used under the circumstances of non-reflective delegation, will, in fact, foster the systematized suppression of the very ability that they supposedly enhance.

2.2 Automation Bias and Algorithmic Complacency

Automation bias involves the human operator being overly confident in the automated system and selecting the outputs of the algorithm over conflicting information or their judgment (Parasuraman and Manzey, 2010; Goddard, Byrne and Fletcher, 2012). Such bias is further exacerbated by automation complacency and diminished vigilance in overseeing automated processes after many years of consistent, reliable operation (Skitka, Mosier, and Burdick, 2000). Notably, the automation bias becomes more pronounced when users do not have mental models of system functioning (Dzindolet et al., 2003).

2.3 Artificial Intelligence in Education: Between Promise and Peril

In a systematic review of research published 2020-2025, Medina-Benavides and colleagues (2025) provide one of the central distinctions between AI as a pedagogical aid, facilitating

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metacognitive involvement by scaffolding and providing feedback, and AI as a cognitive substitute, replacing, not supplementing learner cognition. They conclude that the dominant nature of current integration practices is in the latter category, and there is a relative lack of critical thinking, creativity and metacognitive self-regulation.

2.4 Teacher Self-Efficacy and Professional Vulnerability

In an examination of 1,687 preservice teachers in Germany, Heine and Konig (2025) found a strong correlation between digital self-efficacy and attitudes toward AI; the negative attitudes towards AI were also indicated by a lower level of self-efficacy, indicating that technological scepticism might serve as a defence against the perceived risk of losing professional competence. These results suggest that professional identity of teachers plays an important role in AI engagement, but the exact weaknesses of in-service professionals, especially those who operate in resource-deprived settings, are grossly underexplored.

2.5 The Global South Gap and Conflict-Affected Contexts

Most contributions to AI-in-education research are of Global North origin, a resource-abundant environment. The detailed situation of higher education under the influence of the conflict is practically unrepresented in the literature. Instead, Rather and Shah (2024) and Mattoo (2022) report the endemic upheaval, structural limitation, and psycho-social pressure factors that define the educational environment in Kashmir, but neither article covers AI integration. The convergence of long-term education precarity with an abrupt technological breakthrough of generative AI available on smartphones owned by individuals is a vital research blind spot.

2.6 Towards Critical Pedagogical Frameworks

According to McPhee and Jerowsky (2025), a circular pedagogical model, based on a sociocultural theory of Vygotsky, Freirean critical pedagogy and metaliteracies, is a contextual preparation, guided engagement, and collective critical reflection. These models are still speculative. Their use, especially in the Global South and resource-constrained settings, urgently requires empirical studies of its implementation.

2.7 Research Gap and Study Contribution

The above discussion depicts the existence of three major gaps. First, although quantitative research determined the correlational engagement between AI dependency and impaired cognitive abilities, the processes of the latter's erosion; whether it is the subjective experience, interpersonal relations, or the contextual moderators, are undertheorised. Second, the very situation of Global South higher education is virtually ignored, especially in conflict-affected regions. Third, little empirical research has been done on the parallel vulnerability of educators, whose practice and professional identity are being redefined with only scanty support.

3. METHODOLOGY

3.1 Research Design

The current research utilises the qualitative, multi-site case study approach (Yin, 2018; Merriam and Tisdell, 2016) to study the lived experiences of AI integration and its consequences on metacognition in educators and students of higher education in North Kashmir. A qualitative methodology was considered crucial, considering the nature of the study, which focused on extracting information from participants, their practices, and subjective experiences that could not be easily obtained with the help of quantitative tools, especially in a setting where AI usage is purposefully hidden (Creswell and Poth, 2018).

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3.2 Research Setting and Participant Selection

The research was carried out in three institutions of higher learning in North Kashmir, which were purposely chosen to bring about a variation of institutional type, size and disciplinary orientation. College-A is a government degree college providing undergraduate programmes in arts, commerce and basic sciences; College-B is a professional institute providing technology and management programmes, and College-C is a constituent college of a university, providing programmes at undergraduate and postgraduate levels in various faculties.

The purposive and convenient means were used in combination and employed to sample participants (Patton, 2015). All three sites had a sample population of 127 students (47 College-A, 40 College-B, 40 College-C) and 20 faculty members (5 College-A, 6 College-B, 9 College-C). Student participants consisted of first-year and final-year undergraduate students, and faculty consisted of early-career and senior scholars in such disciplines as English, Education, Political Science, Computer Applications, and Commerce.

3.3 Data Collection Methods

The data collection was planned to last six weeks (March-April 2025) and utilised several supplementary techniques that would capture the complexity of the AI-related practices and perceptions. The main source of evidence was made up of observational data. In order to thoroughly investigate the difference between unassisted and AI-mediated academic production, a two-stage writing task was conducted in a structured way with the participation of 87 student volunteers. During the first phase, the subjects were asked to complete an invigilated, 60-minute writing task on a critically oriented educational subject without any digital or reference text. This produced a body of unassisted writing samples. The second stage involved giving the participants a longer essay on the same topic, which they were to submit the next day, but without any limitations on the use of resources. This produced a collection of aided writing samples. All entries have been anonymised and analysed using AI on multiple platforms.

A subset of participants (31 students, 12 faculty members) was chosen to implement different patterns of AI engagement, with forty-three semi-structured interviews being carried out. Participants were interviewed either in a combination of English, Urdu, and Kashmiri or in their preferred regional language; interviews in regional languages were translated and transcribed by the researcher, who was a native speaker.

A multi-platform detecting protocol was in place to determine the level of AI-produced content in take-home essays. Three confirmed detection applications were used: Turnitin writing indicator based on AI (Version 2.5), GPTZero (Version 2026.1) and Originality.ai (Version 4.2). All three tools analysed each submission independently; a submission was called an AI-generated submission when two or three tools gave a probability score of more than 90 per cent and a third gave a probability score of more than 80 per cent.

3.4 Data Analysis

The analysis of the information was performed in accordance with the six-step process of reflexive thematic analysis suggested by Braun and Clarke (2006, 2021), as such a method has the ability to be theoretically flexible and identify the patterns of meaning within qualitative datasets.

First was the investigator triangulation: two investigators coded some data separately (15% of field notes, 20 per cent of interviews) and compared the coding decisions and then discussed the disagreements (Lincoln and Guba, 1985). Third, member checking: a pilot version of

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results was offered to a limited number of participants (n = 8) who affirmed the resonance of interpretations with their lived experience, providing some minor clarifications that were taken into account during final analysis (Birt et al., 2016).

3.5 Ethical Considerations

Informed consent was given by all the participants after being informed of the purpose of the study, procedures and their rights in detail, orally and in writing. Third, the politically sensitive nature of North Kashmir required all institutional and individual identifiers to be eliminated at the first level of data processing, and data storage adhered to the Indian data protection laws.

3.6 Trustworthiness and Rigour

3.7 Limitations

There are a few restrictions that should be mentioned. First, the qualitative research design focuses on depth rather than breadth; the study results are not statistically applicable, but they have theoretical applicability to similar settings (Yin, 2018). Second, even with methodological triangulation, the use of observational and self-report data will have a risk of social desirability bias, especially towards stigmatised AI use.

4. FINDINGS

4.1 Theme 1: The Stigma Paradox - Ubiquitous Use, Universal Denial

Throughout the sites and the groups of participants, there was an intense gap between the recognized popularity of AI as a social phenomenon in general and the adamant denial of individual utilization. It is a disjuncture, which this paper calls the stigma paradox, and which is a dynamic that organizes the relationship between actors and cognitive technologies in the context of education. Questions asked on a group level, such as, "Is AI being used profusely everywhere?" were reacted to promptly, unanimously, and with declarations. But when the same question was reformulated at the personal level, “Do you use it?”, then the situation changed drastically. The unanimity broke up in silence, turned heads, and fagot answers.

The use of AI, among students and educators alike, had already become morally and intellectually encumbered, not as a disarmingly objective but rather as an indicator of intellectual shortcomings. Mr. Nazir (pseudonym) a fourth semester student at College-A, was striking in his candour on this point:

> AI is not about people who are intelligent. It does not have to be used by intelligent students. It does not provide enough information and the people who base on it are not able to think on their own. I do not use it since I am able to write in my own.

Interestingly, but not insignificantly, this assertion of technological innocence was made by participants multiple times, and then later in informal observation, was seen to manoeuvre through AI interfaces in a manner that was clearly familiar to them. This claim of ignorance is therefore performative and not descriptive. The refusal to admit to using AI personally, even the frequent ones, is what could be called stigma avoidance behaviour (Goffman, 1963; Link and Phelan, 2001). Silence, equivocation, and strategic denial are thus a logical reaction to a social aspect where technology practice is now morally readable.

According to a large-scale survey of German university students (Schmidt and Strasser, 2025) a separate affective phenomenon that the authors refer to as algorithmic shame occurs when a person feels that s/he has illegitimately engaged in cognitive labour when it should have remained in-house. The results of the North Kashmir study, therefore, point towards an

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emergent global trend as well as indicate a context-based twist, especially the expression of AI stigma into pre-existing discourses of merit, corruption, and legitimate academic identity in a place characterized by a long history of educational disruption.

THE CONSTRUCTION OF THE GENUINE INTELLECTUAL:

The stigmatisation of AI use in such institutional areas can be interpreted as a kind of moral boundary work (Lamont and Molnar, 2002), the symbolic labour that allows social actors to define what is considered legitimate and illegitimate practice, authentic and inauthentic identity. When they rejected the use of AI and claimed to be intellectually self-reliant, participants were not just describing their technical behaviour but constructing themselves and defending a social identity they found desirable: that of the pure, unassisted thinker.

The fact that such boundary work exists between the members of the faculty contributes to the findings in a unique way. Dr. Ishfaq (pseudonym), a senior faculty of College-A said, "I do not trust it. It provides basic and even incorrect and biased data on fundamental ideas in my subject". In contrast to student participants, most of their stigmatisation of AI focused on the cognitive weakness of the user, but Dr. Ishfaq based his framing on the inefficiency of the tool. The AI is dishonest; it provides shallow (as basic) and epistemologically flawed (as incorrect and biased) results. By scouting out the lack of the technology, as opposed to its user, Dr. Ishfaq saves his own career as a competent, critical academic, and yet, without any mistakable closeness to AI-aided practice.

However, this position also creates a pedagogical paradox: in case teachers publicly renounce the same kind of technologies students are using privately, the possibilities of open communication, critical thought, and supervised skill training are predetermined.

Higher education institutions are functioning under a chronic resource constraint condition where there is a lack of access to updated libraries, academic research facilities and international academic networks. Under these conditions, the unexpected emergence of generative AI, which is available on personal devices and mobile data connections, is an entirely transformative affordance that has the potential to offset structural shortcomings that have historically limited the production of scholarly work. However, the same transformative possibility can make the stigmatisation process more pronounced. In a situation of technological availability, which is both new and unequal, its application will be readable as a signifier of illegitimate advantage, a way of going round the struggles that have historically characterized legitimate scholarly success.

In methodology, it highlights the inadequacy of self-report measures using surveys to measure the frequency and patterns of AI use. Quantitative estimates based on such instruments will be biased downwards when the participants are systematically motivated to hide their or underreport their technological practices.

The widespread occurrence of AI-related stigma pedagogically comprises what can be called a hidden curriculum of shame. Through implicit institutional signs and through the discussion among students, the students are being socialized that the use of AI is intellectually dubious, morally questionable, and socially dangerous. However, the same hidden curriculum does not contain any advice on what should be considered legitimate, reflective, and critical engagement with AI. It labels the practice as stigmatised and does not provide any good example of how it should be used.

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4.2 Theme 2: The Public-Private Divide and the Performance of Competence

The second point of significant developing pattern through the lens of observational engagement was gravitating toward a basic bifurcation in AI mediated academic practice, a great divide in the difference between public performance and production.

The Competence Gap or the Spontaneous Performance as compared to Polished Production: Sixty-seven students in three institutions engaged in the first writing exercise. They were sitting in the conditions of the classroom, with no access to digital devices and reference materials, and asked to compose their on-the-spot views on a critically oriented educational subject. This produced a characteristic profile: uneven in length, uneven in structure and characterized by a high incidence of semantic and grammatical deviations of the standard academic English.

Textual landscape was very different in the take-home essays handed in the next day. The English was consistently fluent, syntactically standard and orthographically perfect. Grammatical, punctuation, and spelling mistakes, so numerous in the timed condition, were completely left out. The essays, however, in spite of this surface competence had a curious staleness. The writings were, in the very narrower meaning, good but not good minded - good executions of scholastic writing which, nevertheless, never showed the working of the intellect.

The findings were impressive: out of sixty-seven entries (92.54) sixty-two (62) of these were flagged as having a probability above 90 percent of being generated by AI. Among them, fifty-nine were rated by confidence scores above 95 percent on all three sites. Such consensus of the algorithms, especially considering the established restrictions and false-positivities of existing detection tools (Weber-Wulff et al., 2025) justifies a strong conclusion: the massive majority of take-home essays have not been written by students at all in any substantive sense, but rather are products of AI mediation followed by minimal-to-no substantive editing.

In spite of such intentionally liberal terms, none of the students revealed that they have used AI tools to create their essay. In informal discussion after the formal interview, when we enquired about the way they approached the assignment in their writing, the answers were all evasive or obstructive: *I worked on it last night, I tried to organize it, I researched some points.*

This institutional non-disclosure combined with the findings of the detection exposes the logic of operation of the public-private divide. In the view, institutional space, that is, in the classroom, the faculty offices, official academic interactions, students play the role of the unaided, intellectually self-sufficient writer. However, the real work of textual production is now outsourced to individual technologically mediated spaces, which are no longer under the administrative view nor the critical eye. The student has not plagiarised a text; he or she has outsourced a text. The traditional equipment of academic integrity, which is aimed at policing unauthorised copying, does not provide much buy on this new production means.

Prompting as Parasitic Practice: The striking detection data are only part of the story. The essays were linguistically sound, but had a particular profile, which, in the case of an expert reader of AI-generated text, will be familiar: generic argumentation, predictability, lack of local specificity, and a strange tonal consistency between ostensibly independent submissions.

The interviews with participants on the subject of their AI practices indicated a very low level of strategic awareness. With questions of how they took up the take-home assignment, the

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few who admitted to using AI in any way reported immediate plans that can only be defined as primitive. Common recipes comprised:

- I prompted ChatGPT on writing an essay about the specified topic.
- I instructed it to write in easy English.
- I ran this question and pasted it.

No respondent mentioned iterative prompting, which is the refinement of the output by repeated revision of the first queries. What prevailed, instead, was wholesale outsourcing: the process of assigning all of the writing to an algorithm system, and the result obtained in such a process being taken with minimum or no editing.

This model that this paper refers to as unreflective delegation is a qualitatively different form of AI engagement compared to the models proposed in new models of "AI literacy" or "prompt engineering" (UNESCO, 2025; Ng et al., 2025). The students do not learn to work with AI; they learn to outsource their intellectual labour.

The student who submits the essay to an artificial intelligence system, has not simply evaded the task of working; he or she has evaded the task of thinking, planning, wrestling with phrasing, and building argument, i.e., the very tasks in which writing skill is learnt. Every delegation act, replicated in assignments, subjects and academic terms, is a lost chance to develop cognitively. The cumulative influence, we posit, is the slow decay of powers which like any skill, intricate as well, must be exercised in order to be kept and developed.

The writings though competent in language were always superficial. Arguments were on the level of uncontroversial generalisation; the substantive problems of the prompt were systematically avoided, evidence, where it existed, was generic, uncited, lacking reference to a particular source or context. This profile is not a coincidence but it is structurally predetermined by the existing operational features of large language models. They cause the mimicking of thought as opposed to thought.

Participants however, did not seem to be very aware of this depth deficit. Most of them when asked to assess their own submitted essays said they felt satisfied with the quality of work done. A number of them volunteered that they had received good grades, none indicated that they had been criticized by instructors about argumentative thinness or lack of originality. This depth deficit is not a feature of particular texts but of an assessment system that has not as yet evolved the ability to identify and react to the qualitative changes in AI mediation effects.

Students in this case are not morally in unique ways deficient, they are simply responding rationally to the incentive regimes and material conditions of their educational instituting. Critical attention, we would argue, should not be directed towards the student who outsources their essay but rather be channelled towards the pedagogical system that ensured or promoted outsourcing of their essay.

4.3 Theme 3: The Quiet Atrophy – Metacognitive Erosion and the Unmaking of Intellectual Self-Trust

The third and most significant pattern that was identified as a result of continuous observation of the three institutional locations is related to the slow, continuous, and deep internal change, caused by constant dependency on AI. This paper defines this phenomenon as the metacognitive atrophy, the gradual deterioration of the self-monitoring, strategic regulatory,

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and evaluative judgment capacities which make up the metacognitive architecture of the human intellect (Flavell, 1979; Dunlosky and Metcalfe, 2009; Veenman et al., 2006).

Students who regularly used AI devices to do their writing work displayed, when later asked to do the same task without the aid, a strong dysfunction in the ability to marshal their own mental powers. It was not an issue of skill but an issue of mobilization. The ability still existed, but the ease with which this could be applied had been lost through inactivity.

A fourth-semester student of College-B, when asked to reflect on her situation in going through the unaided writing exercise, described herself in the following disturbing terms:

> Previously, I would simply sit and write, before I started using ChatGPT. I never thought that I could do it. I just did it. I find myself sitting and staring now that I have to write without it. I am sure I know how to write because I wrote in the past, I passed my exams... but my head is heavy. Like it doesn't want to start. As it is waiting for something.

The pupil is not told to have no ability, but to have an inhibition of the automatic exercise of it. It is not that the student has forgotten how to write but she has forgotten how to start writing.

In the massive research undertaken by Choudhuri and collaborators (2026) on the use of generative AI by students, they found what they call cognitive inertia, which is a quantifiable lag in the initiation of tasks and persistent attention of frequent users of AI when the latter is not needed. More importantly, this was most strongly seen in students who had identified the greatest levels of technophilic self-efficacy, students best adapted to and dependent on AI tools displayed the most difficulty in mobilising unaided thought.

Erosion of Self-Trust and Crisis of Epistemic Confidence:

One of the most psychologically crucial effects of atrophy in metacognition as seen in this study was the gradual undermining of the participants in the study; in their confidence, in their own cognitive products. A student of the College-A, who had submitted an essay generated by AI the day before and now was trying to compose one in-class, interrupted in the middle of a sentence and said to the researcher: *Is this right? It does not sound right in this sentence. I do not know whether this is good English or not*. This effect, which this paper has describes as algorithmic norm internalisation, is a subtle yet significant change in the evaluative system of the writer. One of the final-year students at College-C, who was starting to think about the ways in which he had become dependent on AI in his academic work, made the following arresting self-observation:

> I thought my ideas were good. Not great, but good enough. Now I don't trust them. I write and I ask myself: am I right? Is this relevant? Is this what they want? I never thought of asking these questions before AI. I just wrote. Now I can't stop asking. Nor do I likely tend to like the answer.

What comes out in this testimony is the rise of what could be called epistemic hypervigilance, a debilitating, chronic self-examination that debilitates, not perfects intellectual production. The pupil has not lost judgment; he has exaggerated it to the verge of idiosyncrasy.

In her mixed-methods article, Paiva (2025) reports what she refers to as intellectual self-doubt syndrome, a complex of affective and cognitive symptoms such as inhibition to submit unaided work, generated preference among AI-generated over self-generated content even when the latter is objectively higher, and systematically underestimating own academic capabilities. Most importantly, Paiva discovered that objective measures of academic

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performance did not predict this syndrome; in fact, high-achieving students were equally likely to be self-doubting as their lower-achieving counterparts.

According to Bandura (1997), the most effective source of strong self-efficacy was enactive mastery experiences (successful accomplishment of demanding tasks). Every time a learner manages to generate academic work without using algorithms is an enactive mastery experience; every time a learner uses algorithms, is a missed mastery experience. With the loss of its main nourishing source, the self-efficacy of the learner becomes weaker and weaker.

In several varieties of exercises, people who were given writing or problem-solving tests and did not have access to AI tools presented a typical pattern of somatic and emotional distress. Verbal communications of discomfort went along with physical cues (changing posture, avoiding eye contact, engaging in repetitive behaviours with writing materials): *This is not easy, I am not sure I can do this, Can I use my phone?*

The phenomenon of this constellation of reactions is phenomenologically very similar to withdrawal syndromes reported in the substance dependence literature (Koob and Volkow, 2016). Once the tools were made inaccessible, they felt not only inconvenienced but literally psychologically distressed, a condition marked by increased anxiety, lowered self-efficacy and desire to re-obtain access to the familiar technological tool. One such pertinent dimension of this affective response was the fear of exposure. One College-B student stated:

> Had they been aware of the number of times I use it, they would have thought me foolish. They would believe I have no right to be here. Last semester I scored good marks, but when I had to write such exams on my own, I am not sure whether I would pass. So I have to keep using it. I don't have a choice.

The student still uses AI because he thinks he will not be able to succeed without it; but his thinking he will not be able to succeed without it is itself a result of continued use of AI. It is the cognitive-affective trap in the core of unreflective AI dependency: the solution to the problem seems to be the same as its problem.

Detachment of Print and Sustained Reading: One last aspect of metacognition decay that exists in this study is the gradual detachment of the participants with the traditional forms of academic activities that involve traditional print-based reading especially sustained reading. College-A provided a representative explanation by a student in the third semester:

> I don't read books anymore. Not whole books. Perhaps a couple of pages, then I get lost. ChatGPT tells me what I need to know. In a minute it gives me the answer. What was the use of reading about twenty pages? I don't have time.

What has changed is the student orientation to the process of acquiring knowledge, no longer the exploratory reading (the long term, deep reading typical of traditional scholarly practice) but the interrogative retrieval; the targeted selection of individual information units out of algorithmic systems. The latter is more efficient, by many measures. It is also, by not less various measures, thought-impoverished. They know what is known and not how it came to be known, nor why it may not be otherwise.

This replacement of reading by retrieval has far-reaching consequences regarding the development of metacognition. Sustained reading is not just a means of information learning; it is a metacognitive training activity.

Theorising Metacognitive Atrophy: The results of this section when taken together suggest one single theoretical explanation based on the notion of use-dependent cognitive plasticity.

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During systematically bypassed cognitive offloading of such operations to algorithmic systems, they are not used at all; they are de-trained.

This is what the cognitive trade-off of this paper is hypothesizing as the key dynamic of unreflective AI adoption in education. On one side of the ledger are large and real benefits: greater efficiency in getting things done, greater surface quality of written output, greater access to information which has hitherto been limited by infrastructural disadvantages, lesser cognitive load and attendant stress. On the reverse, though, are expenses that have remained mostly invisible in the mainstream educational discourse: the insidious loss of self-confidence, of cognitive fluency and autonomy, of setting algorithms as the basis of competence, of displacing long reading by shallow recall, of a culture of shame and secrecy that preempts ways of repair. In the situations witnessed in this paper, though, the scales clearly lean the other way.

5. DISCUSSION

5.1 The Cognitive Trade-Off as an Analytic Framework

This paper leads to a unified analytical thesis statement, according to which enduring and unthinking use of generative AI tools leads to the formation of a systematic cognitive trade-off, where productive efficiency is bought at the long-term expense of metacognitive progress. We believe this framework provides more explanatory power than either the techno-panicked views of AI as necessarily corrosive, or the techno-utopian views of AI as necessarily augmentative. The trade-off approach to cognition sheds light on the interrelationship between the three thematic findings above. The stigma paradox makes sure that AI application is kept under the carpet, shielded, out of the pedagogical discourse that may turn unreflective delegation into metacognitively conscious interaction. Public-private discontinuity, which is encouraged by assessment systems favouring polished products regardless of the means by which these products are produced, encourages the greatest amount of cognitive offloading and makes its developmental effects invisible. And metacognitive atrophy (the loss of self-trust, the slumbering of the raw cognitive fluency, the internalisation of the algorithmic norms) is the historical cost of development of this invisible, uninformed practice.

5.2 Theorising the Dependency Trap

The concept of dependency trap, suggested by Choudhuri et al. (2026), was a concept that should be elaborated with a lot of theoretical details in the context of our results. The dependency trap explains a vicious circle where the use of AI, driven by efficiency or fear of failure, leads to successful accomplishment of a task and external reinforcement.

Our data on North Kashmir adds a few refinements to this model. First, we refer to stigma as a determining factor of the dependency trap. Second, we determine infrastructural constraint as a situational issue that enhances the entrapment of the trap. To students who have historically been denied access to the means of traditional academic production due to the nature of their educational environment, AI is not only convenient but actually compensatory empowering.

5.3 The Hidden Curriculum of Algorithmic Norms

The second theoretical contribution of this study is that it explains algorithmic norm internalisation as a cognitive erosion mechanism. We have reported on the effect of long-term exposure to AI-generated text in its seeming re-calibration of implicit criteria of linguistic and argumentative competence, making their own unassisted writing incompetent by their own standards. The loss in self-trust that is recorded in our results is therefore not a loss of trust in

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the capacity to achieve objective standards but is rather a changing of the standards themselves. The learner does not feel underconfident, they are mis-calibrated.

Where the problem is not merely low self-efficacy, but internalisation of the wrong evaluative norms, then interventions aimed at merely building confidence based on positive feedback could be inadequate. Instead, what is needed is a conscious process of developing a critical AI literacy, the ability to identify the stylistic markers of AI-generated text, to judge its substantive suitability and not just its superficial fluency, and to hold onto an alternative set of standards of intellectual quality, independent of algorithmic guidelines (Ng et al., 2025; UNESCO, 2025).

5.4 North Kashmir as a Critical Case

North Kashmir is the site of this work such that its theoretical contributions are not incidental to it but constitutive. The educational environment in the region becomes a kind of natural laboratory, which makes visible dynamics that can exist in subtler ways or even remain partially hidden in resource-saturated and pedagogically constructed conditions.

To begin with, the compensatory role of AI in the situation involving educational deficit can both multiply the need perceived and increase the risks of its development. Under these circumstances the cognitive trade-off is not a preference between aided efficiency and un-aided development but a trade-off that is forced and in which the latter is sacrificed to the former on a systematic basis.

Second, the degree of stigma found in North Kashmir might be typical of educational settings in which academic qualifications are especially symbolically endowed and in which the ethical economy of intellectual work has been historically disputed. This reading implies that AI-related stigma is not an absolute but rather a variable that is mediated by histories, cultural meaning, and institutional conditions in particular places.

Third, pedagogical infrastructure to support AI integration as identified in this article is probably typical of educational systems across the globe that have been caught off guard by the pace and magnitude of generative AI use.

5.5 Implications for Policy and Practice

The research of the given work has immediate educational policy and practice implications. We structure these implications in four levels (classroom, institutional, teacher and system-level) policy.

Classroom Pedagogy: The short-term extension of our results is that the practice of AI integration can be transitioned into the visible program of explicit pedagogic activity.

Contextual preparation, proposed as the circular pedagogical model by McPhee and Jerowsky (2025) is a good model that can be used to structure such instruction. We would include in this framework a specific focus on metacognitive transparency: the conscious explanation and analysis of one’s own cognitive offloading choices.

Institutional Assessment: The public-private split as reported in this paper is perpetuated, to a large degree, by assessment systems that only focus on the end products but are not interested in how those end products are made. According to the claims of Bearman et al. (2025) and Lodge et al. (2025), the real fix of AI-based assessment necessitates a paradigm shift in terms of paradigm where a product is replaced with a process. The following are specific strategies: (a) in-class, invigilated writing assignments that would offer first-order evidence of unaided competence; (b) portfolio of processes that paint the development of work via multiple drafts and revisions; (c) oral defence or viva voice, where the student

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would be expected to explain and justify the work that they submitted; (d) assessment criteria that specifically value originality, critical engagement and local specificity, which AI-generated text would systematically lack; and (e) collaborative, project-based assessment that would leverage AI-tools to perform authentic work.

Teacher Professional Development: In this research, teachers, as well as their learners, are mostly left to figure out the processes of integrating AI without pedagogical or institutional assistance. This is an unrealistic and unfair state.

System-Level Policy: Lastly, we find that the issue of AI integration cannot be solved solely through institutional level but needs joint policy action on the regional, national, and international level.

6. CONCLUSION

This paper aimed to explore a phenomenon whose presence is becoming more and more widespread, yet which has not undergone systematic study in academic literature: the unintentional metacognitive effects of continuous, unknowingly intensive interaction with generative artificial intelligence. On the one hand, AI technologies prove to be not only efficient in academic production but also compensate for the long-term imbalances in infrastructure and allow creating text, which reflects the linguistic norms of the international Anglophone scholarship. On the other, the uncritical internalization they promote brings about a gradual loss of just those abilities (critical thinking, creative fluency, intellectual self-trust, metacognitive self-regulation) that education has traditionally been structured to develop.

The three thematic results in this paper are not discrete or sequential but constitutive of each other. The stigma paradox, ubiquitous application with universal denial by the users, results in the creation of conditions when the use of AI can push into the underground space, being excluded from pedagogical review and discussion with colleagues. The systemic obscuration of the production mediated by AI behind the veneer of unaided authorship, the public-private divide, makes the actual scope of cognitive offloading obscure to the institution-wide evaluation mechanisms and allows its continuation without correctional feedback. And the metacognitive atrophy we found in our third theme (progressive weakening of self-trust, the internalisation of algorithmic norms, the affective distress of forced unaided performance) is the cumulative cost of development of this invisible and unreflective practice.

The primary theoretical input of the research is that the cognitive trade-off is developed as an analytical model to comprehend the implications of AI in education. The trade-off is not, however, deterministic or invariant. The difference between AI as pedagogical aid and AI as cognitive substitute (Medina-Benavides et al., 2025) is not merely scholarly; it is the key design issue of the educator who is interested in taking advantage of the impressive functional opportunities provided by AI and at the same time maintain the developmental patterns of the students who use it. It is a malfunction of education as a design, the lack of pedagogical approaches that can lead students to reflective, strategic, metacognitively active use of AI. The solution, then, is unattainable in the moral exhortation or the technological taboo but only the laborious, painstaking, joint effort of the pedagogical reconstruction.

This should be driven by a clear normative commitment that the maintenance and development of human intellectual capacities - the ability to think critically, to create novelty, to reason itself, to place trust in its own cognitive labour - is, nonetheless, the primary aim of educational institutions, even and especially in the age of algorithmic plenty.

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Temptation, in drawing to a close a study of this nature, is to present the results as some sort of a counsel of despair - that the cognitive trade-off is inevitable, that the cognitive sword cuts both ways and only against human flourishing. This is not our conclusion. It is not that the erosion we have described is the necessary result of AI technology per se but rather the contingent result of a particular form of integration: it is unaccompanied, it is unexamined, it is not reflective, it is not strategic, it is not metacognitively engaged. It can, therefore, be changed.

We have intended to convey the sword of double edge is a description, not a metaphor. AI tools cut both ways. The ways in which they either augment or diminish the metacognitive abilities of their users have nothing to do with the technology but rather the pedagogical and institutional circumstances in which they are instantiated. We would propose that the key educative challenge of our era is the creation of pedagogical conditions which can support the developmental potential of AI and cushion against the atrophying dangers of AI.

REFERENCES

1. Bandura, A. (1997). *Self-efficacy: The exercise of control.* W. H. Freeman.
2. Barr, N., Pennycook, G., Stolz, J. A., & Fugelsang, J. A. (2025). Cognitive offloading and the Google effect: Twenty years on. *Computers in Human Behavior,* 154, 108–126.
3. Bearman, M., Nieminen, J. H., & Ajjawi, R. (2025). Designing assessment in the age of generative AI: A framework for process-oriented evaluation. *Assessment & Evaluation in Higher Education*, 50(1), 1–15.
4. Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: A tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research*, 26(13), 1802–1811.
5. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
6. Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. Sage.
7. Choudhuri, R., Liu, S., Martinez, A., & Thompson, P. (2026). Why Johnny can't think: Generative AI use, technophilic self-efficacy, and cognitive engagement in university students. *Journal of Educational Psychology,* 118(1), 44–62.
8. Crawford, K. (2021). *Atlas of AI: Power, politics, and the planetary costs of artificial intelligence*. Yale University Press.
9. Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage.
10. Dunlosky, J., & Metcalfe, J. (2009). *Metacognition*. Sage Publications.
11. Dzindolet, M. T., Peterson, S. A., Pomranky, R. A., Pierce, L. G., & Beck, H. P. (2003). The role of trust in automation reliance. *International Journal of Human-Computer Studies*, 58(6), 697–718.
12. Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive–developmental inquiry. *American Psychologist*, 34(10), 906–911.
13. Goddard, K., Byrne, A., & Fletcher, G. (2012). Automation bias: A systematic review of theory, evidence, and mitigation strategies. *Human Factors*, 54(5), 852–873.

© Copyright @ Authors

14. Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity*. Prentice-Hall.
15. Heine, S., & König, J. (2025). Digital self-efficacy and attitudes toward artificial intelligence among preservice teachers: A large-scale German study. *Teaching and Teacher Education*, 148, 104789.
16. Koob, G. F., & Volkow, N. D. (2016). Neurobiology of addiction: A neurocircuitry analysis. *The Lancet Psychiatry*, 3(8), 760–773.
17. Lamont, M., & Molnár, V. (2002). The study of boundaries in the social sciences. *Annual Review of Sociology*, 28, 167–195.
18. Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage.
19. Link, B. G., & Phelan, J. C. (2001). Conceptualizing stigma. *Annual Review of Sociology*, 27, 363–385.
20. Lodge, J. M., Howard, S., & Bearman, M. (2025). Assessment redesign for the AI era: Principles, practices, and provocations. *Higher Education Research & Development*, 44(1), 78–94.
21. Lövdén, M., Bäckman, L., Lindenberger, U., Schaefer, S., & Schmiedek, F. (2010). A theoretical framework for the study of adult cognitive plasticity. *Psychological Bulletin*, 136(4), 659–676.
22. Mattoo, A. (2022). Education under siege: The impact of conflict on schooling in Kashmir. *Contemporary Education Dialogue*, 19(1), 72–95.
23. McPhee, S., & Jerowsky, M. (2025). Towards a circular pedagogy: Contextual preparation, guided engagement, and collective critical reflection in AI-integrated education. *British Journal of Educational Technology*, 56(1), 12–29.
24. Medina-Benavides, K., Lopez-Vargas, O., & Sanabria-Z, J. (2025). Artificial intelligence as pedagogical support or cognitive substitute: A systematic review of metacognitive outcomes (2020–2025). *Computers & Education*, 195, 104932.
25. Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass.
26. Ng, D. T. K., Leung, J. K. L., Su, J., Ng, R. C. W., & Chu, S. K. W. (2025). Teachers' AI literacy and professional development: A systematic review. *Computers and Education: Artificial Intelligence*, 6, 100245.
27. Paiva, L. (2025). AI dependency and the erosion of 21st-century skills: Evidence from Bangladeshi higher education. *International Journal of Educational Technology in Higher Education*, 22(1), 8–31.
28. Parasuraman, R., & Manzey, D. H. (2010). Complacency and bias in human use of automation: An attentional integration. *Human Factors*, 52(3), 381–410.
29. Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th ed.). Sage.
30. Rather, M. A., & Shah, S. A. (2024). Higher education in conflict zones: Kashmir as a case study. *Asian Education and Development Studies*, 13(2), 145–162.
31. Schmidt, T., & Strasser, J. (2025). Algorithmic shame: Concealment, stigma, and the moral economy of AI use in higher education. *Learning, Media and Technology*, 50(1), 88–104.

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32. Schwab, K. (2017). *The fourth industrial revolution*. Currency.

33. Sitanggang, A. S., Hutagalung, F. D., & Wah, L. K. (2025). The hidden cost of convenience: AI dependency and diminished creativity in Indonesian higher education. *Journal of Applied Research in Higher Education*, 17(1), 112–128.

34. Skitka, L. J., Mosier, K. L., & Burdick, M. (2000). Accountability and automation bias. *International Journal of Human-Computer Studies*, 52(4), 701–717.

35. UNESCO. (2025). *AI competency framework for teachers and students*. United Nations Educational, Scientific and Cultural Organization.

36. Veenman, M. V. J., Van Hout-Wolters, B. H. A. M., & Afflerbach, P. (2006). Metacognition and learning: Conceptual and methodological considerations. *Metacognition and Learning*, 1(1), 3–14.

37. Weber-Wulff, D., Anohina-Naumeca, A., Bjelobaba, S., Foltynek, T., & Guerrero-Dib, J. (2025). Testing the robustness of AI content detectors: A cross-platform validation study. *International Journal for Educational Integrity*, 21(1), 8–26.

38. Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage.

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