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From Tool to Teammate: Rethinking the Pedagogical Relationship with Generative AI

Abstract

With the quick incorporation of generative AI into learning environments, students' learning experiences have been radically transformed in a way that the former passive technological aid became an active, and, at times, deceiving partner in the learning process. Although such rapid developments contribute positively to learning efficiency and accessibility, they pose serious concerns related to over-reliance, cognitive offloading, and low levels of learner autonomy. In this action research project, it is explored how 23 participants utilize generative AI and the effects of pedagogically grounded measures used in order to encourage reflective engagement with AI technology. Moving from a dependency model of human-AI interaction towards a more balanced relationship reveals that future success in the augmented work environment does not involve receiving high marks but rather mastering the critical thinking and reasoning skills necessary for navigating an augmented world.

Keywords

Artificial Intelligence in Education, Generative AI, Cognitive Offloading, Responsible AI, Reflective Learning, Human-AI Interaction

1. Introduction: The Global Landscape of Generative AI in Education

We have reached a critical point in history where digital technologies do not only store or extract information but actually build knowledge structures and simulate thinking processes. With the advent of generative AI, we have transitioned from the search engine age into a two-sided paradigm in education. On one side, these technologies facilitate unparalleled access to intricate combinations of information, personalization of learning paths, and increased efficiency. On the other side, they pose essential questions regarding authenticity, learner autonomy, and the importance of mental labor in the learning process. In terms of policy and ethics, UNESCO encourages a human-centered perspective by highlighting that technology is meant to enhance rather than supplant human thinking and autonomy (UNESCO, 2023).

It is important to mention that this necessity of human-centricity in the face of increasing AI has been pointed out due to the dramatic rise of literature – based on the bibliometric analysis provided by Ng and Ho (2025) – which shows that it is absolutely essential to deal with the issues related to the transformation of ethical and pedagogic aspects of the higher education sector right now. Otherwise, there is a possibility of a new global division, which, according to the findings of the World Economic Forum (2023), will be caused by increased use of AI, making the line between people capable of directing AI for their benefit and those dependent on it much thicker. On the one hand, generative AI can be useful when it comes to studying if properly utilized; however, on the other hand, it may lead to increased over-reliance and lack of cognitive involvement on the part of a learner (Iqbal et al., 2025).

Amidst this constantly shifting scenario, being a teacher provides some firsthand insight on how relevant this issue is. Firstly, the AI-generated texts posed

questions regarding the academic integrity of students and even affected their long-term cognitive development in a sense. For example, at least once a learner included in their assignment the instruction prompt that came from the language model, such as "You may use the below content". This was not just a mere accident. The issue, however, was far from such a benign one as it suggested that the individual had reached a point where he or she stopped engaging with the material in question and, consequently, could no longer differentiate between what was right and what was wrong.

It is here that a broader issue comes up as the problem does not lie in the presence of AI within the learning process, but in the lack of a proper way to implement its use. Left to its own devices, any learner will most likely end up in the pitfall of passive usage of artificial intelligence, which means that the individual will end up losing his or her own thought process in the process. On the other hand, utilized in an appropriate manner, the very same mechanisms may assist in enhancing human capabilities.

2. Problem Statement: The Illusion of Competence

Observations at the onset of the class of 23 students showed that there was an obvious and consistent pattern of use of AI that reflected a form of uncritical reliance. This practice was usually packaged as a façade that concealed ignorance.

2.1 Surface-Level Efficiency vs Deep Learning

More and more learners relied on AI technologies to solve their tasks and present materials extremely quickly. But this increased efficiency frequently entailed a lack of comprehension. The material turned out to be presented in an elegant manner, with a clear structure and good logic, making learners appear like masters of the

subject matter. However, a close examination showed that there was always a significant gap between the completed material and the learners' comprehension level. Learners often failed to explain the material using their own words. Such a finding corresponds to recent studies that show how AI technology may lower learners' engagement since it allows them to circumvent necessary thinking activities (Ataev, 2025).

The disparity became very evident from the mismatch between language proficiency demonstrated by learners in their written assignments and the actual grasp of what they were communicating about. There was a lot of sophisticated vocabulary usage in their assignments that went beyond the norm for a higher diploma course. Examples include socio-technical construct and heuristic evaluation. These concepts had been properly used in writing although they could not be grounded in the learner’s own reasoning. On being prompted to explain what they meant, a majority of the learners either could not answer or did so with difficulty.

All these observations suggest the onset of a new paradigm of knowledge production and representation. It is not because the students are being exposed to high-level terms and concepts; it is rather that the agency to make meanings no longer lies within the learner himself. The language itself may be accurate, but it belongs to the system from which it came rather than to the person speaking the language. This gradual shift from knowledge production to knowledge representation shows a quiet erosion of learner agency.

2.2 Hallucinations and the “Phantom” Link

In addition to this linguistic disconnection, a second and potentially even more sinister aspect of the “illusion of competence” phenomenon manifested itself: lack of vigilance. It could be observed not only in the students’ writing style, but in their approach to research as well. Aside from the problems of having received an

unwarranted eloquence boost, there was a consistent pattern of accepting machine-produced results without proper cross-referencing. An example of this came up during a class discussion, where the source provided in a student paper redirected to a 404 Not Found page. The deeper investigation into this revealed that the reference was simply made up, seemingly credible and not leading anywhere at all.

When the topic was brought up for discussion, the student confessed that they truly feel shocked at how easy they have been taken in, believing anything presented to them without question. The student offered his apologies by saying, "Sorry sir, I didn't realize that it was possible for us to be taken advantage of so easily. In the future, I will be more cautious and ensure that all my facts are exact." This incident not only happened to the student in question, but it also happened to the entire class. It was then that the students recognized the need for them to accept their weaknesses when it comes to evaluation.

2.3 Linguistic Mismatch and Cognitive Disconnect

One other striking observation was that learners had developed such a highly sophisticated level of academic language usage that they could not express it orally themselves without assistance. In responding to queries regarding their work, some learners demonstrated reluctance and uncertainty.

2.4 Cognitive Offloading and Reduced Agency

All the above-mentioned phenomena contribute to the concept of cognitive offloading, meaning that learners delegate their cognitive activities to the AI tools, thus avoiding any effort. Although cognitive offloading is not an absolutely negative phenomenon, its over-reliance may lead to critical thinking impairment and poor self-regulation.

According to existing evidence, the excessive use of such approaches is likely to reduce learner agency, transforming a person into a mere recipient of knowledge (arXiv).

2.5 Core Problem

The main problem noted in the above study was not about the use of AI but rather the lack of any systematic process or guidance through which students can learn about meaningful ways of using AI in their respective environments.

3. Methodology: Breaking the Individual Cocoons

The action research approach is chosen because of its close relevance to educational settings where the goal is to enhance practice while gaining contextually relevant findings. The research process was conducted following an iterative process that comprised three essential stages. The observation stage concentrated on observing learner behaviour and interaction, as well as early reactions to the application of AI. This was followed by the intervention stage, whereby structured processes for ethical and meaningful application of AI were implemented. The reflection phase involved the evaluation of the behavioral and learning outcomes of the learners.

The experiment was carried out in a classroom setting that consisted of 23 participants who were undertaking their activities and presentations. Each of the learners exhibited different levels of engagement in the use of AI tools ranging from infrequent usage to constant usage. This served as a good platform for observing differences in behavior, adaptation, and response to guided assistance. The whole experiment remained qualitative through the observations made and the changes in the behavior of the learners.

Data collection was done in various ways, each enhancing the other. Classroom observation was the primary method as it captured real behaviors, interactions, and engagements. Other sources of information included student reactions to what was happening, which helped understand how students viewed the situation, including any obstacles encountered along the way. In addition, instructors' reflections became one more vital source, contributing to understanding how things proceeded and what kind of adjustment was required. All the ethical concerns were considered during the entire course of the research process. Not only the private information, but also the confidential information was never collected from the participants; besides, the observations remained anonymous to the students. The study has been carried out within the limits of the regular educational process, making sure that no extra pressure is imposed on the learners by virtue of their participation.

Through this well-designed research approach, there was a conscious effort to make an adjustment in terms of the teaching technique that resulted from the observed pattern among the learners to work individually and in their own worlds. The approach taken involved the use of a good cop/bad cop approach, but this was carried out in a pedagogical setting. The researcher played the part of a friendly peer who taught according to what the learners desired for most of the time. It is only when it came to evaluating their performance that he took up the role of a teacher.

Practical examples that were relevant to the learners were always introduced to encourage more engagement. In one such instance, there was the hypothetical scenario of someone having won a huge amount from the Toto lottery and having to use the funds in some manner that would be significant. There were two courses of action that could be taken as far as this scenario was concerned, both of which were discussed in class. One was the option to donate the money,

whereas the other was to start a training institution where people could prepare for the future hybrid work environment.

It helped bring about a significant change in the mindset of the learner. This resulted in the realization that there was a lot more complexity and variety when it came to individual thought processes. Learners realized that although people may have different perceptions, through group reflection and discussion, there could be much more insightful conclusions drawn from the whole process. Another aspect that was revealed during this exercise was that of reasoning, which had never been explored before by learners in their learning experience.

With the changing nature of the class setting from a more closed one to an open and relational one, there were changes in how the students interacted within the classroom. As such, they became more proactive in seeking feedback, engaging in conversations, and doing assignments in advance. Recognizing the tutor as a mentor and not just someone judging them, they showed a greater sense of being willing to improve on their thoughts and outputs through iterative improvements. This also signified that they became more reflective in learning, thinking, and reasoning processes.

4. The Intervention: Fostering a Partnership Mode

The intervention aimed at being two-pronged; one focused on responsible practices and the other on nurturing metacognition amongst the learners. Instead of seeing AI as something to be used and limited, the emphasis here was on training the individual learner to become a thinker who can contemplate his use of the technology. The aim was for him to move from dependency to purposeful action.

The intervention was based on a series of activities that were introduced systematically during the entire learning process. The learners had to verify the references generated by the AI technology to ensure that such information is accurate and reliable considering the growing problem of false and unreliable results. In addition, they were required to attempt completing the tasks on their own without seeking the help of AI so as to solve the cognitive problem presented to them. An additional activity that was required of the learners was to rewrite the information provided by AI using their own words. The final task that was required of the learners was to explain the logic behind AI solutions.

In order to encourage reflective thinking, a model known as Modes of Engagement was developed. This provided an individual with the opportunity to analyze his/her engagement with AI.

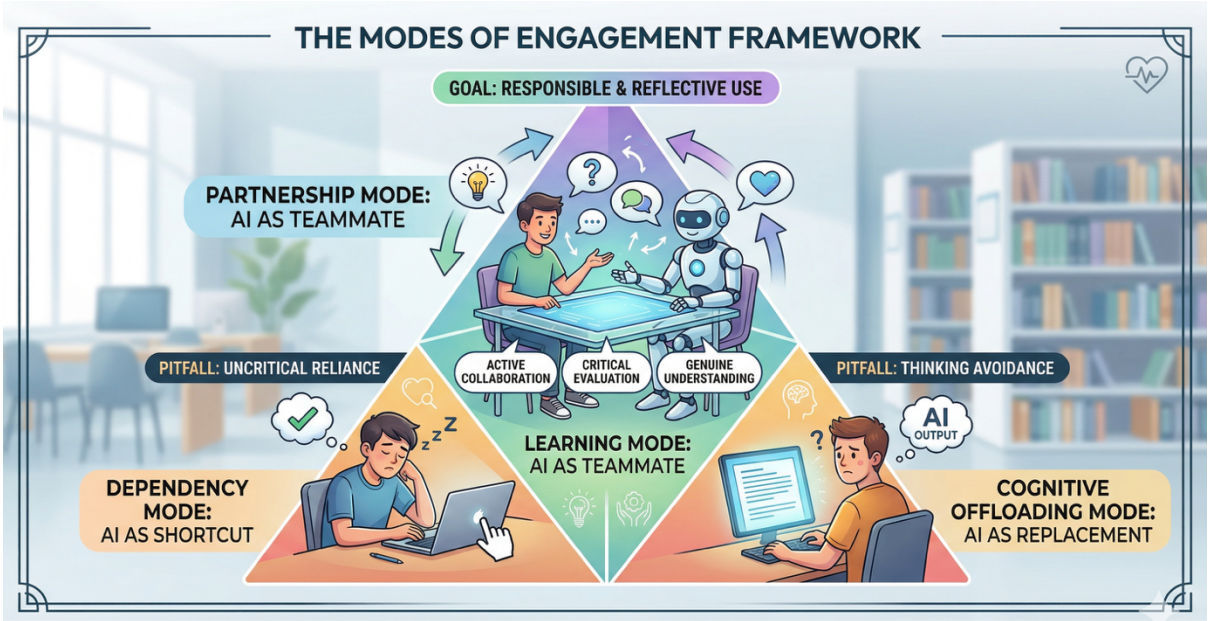

FIGURE 1. THE MODES OF ENGAGEMENT FRAMEWORK FOR AI IN LEARNING. A PEDAGOGICAL MODEL CONTRASTING LEVELS OF ACTIVE HUMAN ENGAGEMENT AND CRITICAL THINKING ACROSS DIFFERENT AI INTERACTIONS.

This model is used as the metacognitive mirror, and as seen on Figure 1 below, it helps visualize the movement away from the extremes represented by avoidance and blind usage (bottom corners marked as the pitfalls) towards the optimal "middle way," which is represented by the Partnership mode at the top. This visual metaphor became very helpful in explaining complicated cognitive processes and helping the learners see the necessity for the behavioral change that needed to occur.

Three modes have been identified and defined by students: the Dependency Mode included AI being used as an easy way out to avoid any effort; the Partnership Mode involved AI being used as a helpful partner in generating new ideas but not doing the thinking itself. Lastly, the Cognitive Offloading mode meant using AI to replace the cognitive processes of the user themselves.

One of the important considerations in implementing the intervention involved a reframing of AI in the role of being a collaborator and not a replacement. This way, it was possible to continue working with AI and at the same time increase accountability for the result of this collaboration. There were no restrictions on how the students used AI; rather, they were taught to work with it in a responsible way. This line of thinking is supported by some of the recent research on pedagogical partnership and AI, where it is shown that AI complements and enhances human cognition (Wang and Zhang, 2026).

The process of implementing the intervention practices was designed gradually to ensure minimum pushback and resistance from the students. The strategies involved introducing the practices gradually so that learners would be able to cope with the process step-by-step. Reflective questions were incorporated into the assignments, and class discussions helped address common difficulties and normalize the use of AI.

It is important to note that there were no limitations set for AI utilization. On the contrary, it aimed at setting a new purpose for its application as well as a new way to do it. Learners stopped focusing on the output of tasks and started working on gaining more knowledge about the topic. It helped shift learners' attention from performance to reasoning and validation.

5. Findings: Behavioural Transformation and the Final Evaluation

Through all three interventions, one significant change was clearly observable among learners' behavior. From being just consumers of the outputs generated by AI technologies, learners began to participate actively in an interactive engagement process with AI through the interpretation, analysis, and improvement of those outputs. One can clearly observe this in the way that learners behaved during the final presentations of assignments when the overall mood was marked with seriousness and commitment. Learners listened to each other intently and attentively without any interruptions or signs of distractions.

While presenting their assignments, various questions were asked with the goal of provoking learners' reasoning abilities. Such questions were not designed to test knowledge; instead, the idea was to help learners think and analyze their works and justify them rationally. In a number of cases, learners seemed to be surprised with unexpected questions that required thinking beyond the scope of what they had learned. Nevertheless, it was decided not to apply any sanctions in such situations.

Several distinct behavioral changes were also evident. Students stopped reproducing information and started making sense out of it in their own ways. There was also the trend of shifting from output orientation towards understanding

as learners took time to verify references and recognize or remove any hallucinations in the assignments. In addition to an improvement in presentation skills, students also made their assignments meaningful by ensuring consistency between their ideas and actual explanations.

Moreover, increased cognitive involvement also manifested itself as learners questioned their assumptions and reviewed their ideas multiple times. Thinking independently became easier for students as they started voicing their opinions without hesitation. According to a study, such results are expected as students tend to become more self-aware in their thinking and learn more deeply with active involvement (Iqbal et al., 2025).

Apart from learner achievements, some changes took place in the classroom environment itself. Mutual trust grew stronger, which might have been facilitated by the non-punitive and supportive stance adopted through the entire process of implementation. Acceptance of rules, discipline during group work also grew significantly. The participation rate increased and was meaningful because the level of engagement rose as well.

Surprisingly, there might be an application of such concepts in settings beyond academic settings. At Brain's (Bharat Research in AI and NextGen) first international conference held in Singapore (Braincon 2026), similar values regarding AI utilization and reflection might prove relevant to the participants. Thus, the implementation of the proposed concepts could have significance not only in educational context but in real life situations when it comes to dealing with AI.

6. Discussion: The Augmented Way Forward

However, the results of this research raise a critical dilemma regarding the integration of AI into the process of learning. On the one hand, AI has huge potential to improve the quality of education and facilitate the process of gaining new skills. It reduces the number of challenges and makes various tasks much easier. On the other hand, any meaningful learning implies overcoming some kinds of resistance and obstacles. Thus, the use of AI threatens to become the source of weakening of cognitive processes due to the fact that the process of learning becomes too easy.

Consequently, the use of AI in the field of education raises the issue about the necessity to change the role of educators. Nowadays, they operate mostly as providers of knowledge. They do not perform the function of facilitating the learning processes and cognitive development of students. However, in the context of increased involvement of AI into the educational process, educators should focus on the issue of guiding students' learning rather than providing them with knowledge.

Consequently, it is necessary to reconsider how people interact with technologies. As an approach that would be beneficial for this shift, it is reasonable to consider treating AI as a partner that allows people to collaborate with machines to extend human potential rather than substitute for it. As per current trends, researchers suggest developing a framework that would help AI learn from teachers and students in order to enhance the quality of education (Wang and Zhang, 2026). There is also the idea of creating more empathic types of technology that will be capable of identifying individual needs in different situations and responding to them adequately. Nevertheless, the use of AI does not mean that people will be able to work without it.

The development of any technological innovation poses specific risks, and one of them relates to intellectual atrophy. The increased reliance on algorithms and machine learning may result in a situation when individuals do not need to think about things actively anymore because technologies will perform these actions themselves. Consequently, their cognitive potential will remain unexploited, which means that certain functions will be redundant and serve no purpose.

However, viewed more broadly, the implementation of AI technology marks not only a change in terms of how work gets done but also in terms of thinking and teaching processes (World Economic Forum, 2023). Rather than mere output or grade-based achievements, success in this new era of work will be characterized by critical thinking skills, reasoning capabilities, and reflection on issues of great complexity. This is how preparedness for hybrid work can be defined in a contemporary context.

These findings have many implications, which touch upon various levels of analysis. The role of the educator is to incorporate reflective features into AI-related activities and encourage students to justify AI-generated results. In turn, the role of the learner is to critically interact with AI technologies, validate their outputs, and focus on deep understanding rather than surface-level completion. On a larger scale, there is an increasing necessity to adopt AI literacy frameworks and advocate human-oriented approaches to AI use in teaching and learning (UNESCO, 2023).

In summary, it should be clear that all these findings come back to one essential notion. AI is neither good nor bad for education in itself; its effect is conditional upon implementation and interaction with it. The important task now will be not to suppress AI but to apply it in a way that would make humans better thinkers.

7. Implications for Practice: Operationalizing the Partnership Model

Thus, the incorporation of AI in education can be regarded as a step towards re-designing education itself. In this regard, the outcomes of this research indicate that issues related to the improper utilization of AI tools are not connected to the malicious intention of students, but rather to a lack of guidelines and specific directions provided in terms of the pedagogical nature of the task. While being allowed to interact with AI independently, students tend to seek out ways to optimize their efforts and produce desirable results. At the same time, when encouraged to reflect upon their actions and develop learning skills, learners are able to utilize AI efficiently.

Considering the described problem and its potential implications, it is possible to propose the idea of treating AI as a teammate rather than a tool. This conceptualization allows distributing responsibility between the user and software equally, while also providing an opportunity to encourage reflection. Notably, such an approach will not limit access to AI or monitor users' activities strictly. Rather, it will allow teachers to provide learners with relevant guidelines and foster meaningful interaction with AI technology.

7.1 Implications for Educators: Designing for Thinking, Not Just Output

Educators need to play an intentional role in determining the design process in AI use within education. In order to do this, they will need to incorporate experiences where the learner actively uses cognition in order to learn from and work with the tool. Reflection will also need to be built into AI based experiences, encouraging learners to reflect upon what they have created and how and why they did it.

It will also be necessary to encourage justification of the AI output. If learners feel like they need to justify the response that was generated using AI, they will more likely examine the information and discover any mistakes or contradictions present in it, which will result in greater comprehension and meaning making.

Also, it will become necessary for educators to develop an AI inclusive pedagogy. Educators should move away from creating assessments where they try to prevent students from using AI tools, and towards creating experiences where shallow use of such tools becomes unfeasible.

7.2 Implications for Learners: Reclaiming Cognitive Ownership

The major shift for the learners is to move away from passive consumption to becoming actively engaged. This starts by cultivating a critical attitude towards the answers provided by the AI technology. Instead of accepting what AI gives out, the learners need to learn how to critique the answers in terms of validity and possible bias or even inaccuracies.

Verification processes become a norm for learners. This can be through looking up references, verifying claims, and testing out logic used in arguments. At the same time, learners have to put more effort on internalizing answers rather than just completing tasks. The focus should be on the ability to articulate the answers rather than just answering the questions correctly. When working as partners with AI technologies, learners have to stay engaged in the thought process.

7.3 Implications for Institutions: Building Ecosystems for Responsible AI Use

On an institutional level, the shift from fragmented strategies to more holistic ones will ensure responsible AI adoption and implementation. Cultivating AI literacy is crucial in this regard. It will not only enable learners and educators to become

aware of the capabilities and potential of artificial intelligence technology, but also help them identify the challenges associated with its use.

Fostering the ethical use of AI is just as important. It involves raising awareness about issues like hallucinations, biases, and overdependence, and promoting transparency regarding the integration of AI in educational activities.

Finally, institutions should promote human-centric learning paradigms, emphasizing cognition, autonomy, and engagement in the process. This approach is consistent with global views on technological progress, which emphasize maintaining the centrality of human thought in any developments (UNESCO, 2023).

7.4 Towards a Practice-Oriented Framework

On reflection, the above implications imply that AI incorporation into the educational experience requires consistency at all tiers of the learning process. It is important to note that teachers design learning content for engagement, while learners accept the responsibility of comprehending. Finally, institutions must provide a conducive environment for both the educator and learner.

8. Conclusion: : Sustaining Human Thinking in an AI-Augmented World

The inclusion of generative AI into the education process is a landmark event, one which is not limited to the ways of accessing information but also involves its creation, interpretation, and perception. It was the objective of the present study to analyze how students interact with the technology and what kind of influence certain interventions have on their interaction. The conclusion drawn from the analysis can be described as obvious yet consistent. Problems that arise with AI

do not originate from the very nature of the technology but result from its use, interpretation, and guidance within the education context.

In the first place, one could observe that the students exhibited features of dependence, offering excellent work, indicating poor comprehension levels. As a result of the application of suitable interventions, which target enhancing students' awareness of their thinking processes, reflection and critical thinking, some changes have emerged. The students have adopted an approach of collaboration that involves using the technology of the computer in helping thinking.

One of the most important lessons learned through this research is that it does pay off when one engages in actions that may be considered minor. Such actions include reference validation, editing the output, and giving reasoning for the explanations provided. The importance of such actions lies in the way in which they place the learner within the learning process. They turn the learner into a participant rather than a consumer of AI-based learning activities.

The other important lesson to take from this study is the need for human intervention. One needs a competent instructor to ensure that the learners participate in the learning process successfully. This would require an environment that is characterized by transparency, trust, and questions. Technology is important in learning, but it alone cannot ensure success.

With regard to future considerations, the ability to maintain this critical balance of efficiency and depth, automation and agency, will determine the course of education in years to come. Further advancements may bring greater intuitiveness of AI as well. At the same time, the need for human thinking, questioning, and reasoning can and should stay at its place, ensuring that the process of cognitive work does not fade away through time and thus undermine all education efforts.

As an idea of AI being a partner rather than an authority can be considered positive and constructive for the development of the modern education paradigm, it is important to take advantage of its potential and benefits. Thus, people would still be able to think by themselves, adapt to the complexity of situations, and become valuable teammates in augmented reality.

Overall, what should be done regarding this problem is neither resisting nor fully relying on artificial intelligence but using it as a tool for enhancing one's mind.

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