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AI at the Right Moment: Designing AI-Supported Learning in Flexible and HyFlex Environments

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Abstract

Generative artificial intelligence (GenAI) is becoming an increasingly important part of the learning environment for students and instructors, creating new possibilities for timely support while also raising concerns about overreliance, cognitive offloading, learner agency, and human connection. This paper introduces AIMON: AI in the Moment of Learning Need as a learner-first, learning-process-first framework for designing AI-supported learning in flexible and HyFlex environments. AIMON begins not with a tool but with a learner experiencing a recognizable moment of need. Seven principles guide decisions about what learning work should remain with the learner and what form of support is most appropriate. The framework adapts the Five Moments of Need tradition for course-based learning and distinguishes support from substitution by asking what thinking, judgment, practice, and creation must remain consequential learner work. AI is positioned within a broader support ecology that also includes instructors and other human experts, peers and community, designed resources, and independent effort. Examples from three higher education course contexts and early student survey evidence illustrate the framework in practice. The paper then translates AIMON into a four-question design process and considers its implications for the HyFlex principles of learner choice, equivalency, reusability, and accessibility. The central argument is that flexible learning should provide more than flexible access to instruction; it should provide flexible access to appropriate support across the learning process.

Keywords: AIMON, HyFlex, flexible learning, generative AI, learner support, scaffolding, learner agency, AI-supported learning

Introduction

Generative artificial intelligence (GenAI) has quickly become part of the everyday learning environment in many settings. Students can often use AI tools to clarify instructions, brainstorm ideas, create study aids, rehearse explanations, receive feedback, and ask questions they may not be ready to ask publicly. Faculty can generally use AI to plan activities, generate examples, develop rubrics, support feedback, and imagine new forms of learner interaction. Evidence associated with GenAI use in learning and teaching is also becoming more nuanced: a recent meta-analysis found generally positive effects of GenAI on several university learning outcomes, while also finding substantial variation associated with learners, tools, roles, rules, and contexts (Chen & Cheung, 2025). For educators working in flexible and HyFlex environments, these capabilities raise an important design question.

The question is not simply, “Should students use AI?” Nor is it enough to ask, “Which AI tools should we add to our courses?” A more useful question begins with learning:

How do we design AI-supported learning so students receive the right support at the right moment, while preserving critical thinking, learner agency, and human connection?

This question reflects the central concern of AIMON, or AI in the Moment of Learning Need. AIMON is a learner-first, learning-process-first design framework for thinking about how AI can support learning without substituting for learning. It is not a framework for maximizing AI use or showcasing tools. Instead, it begins with the learner’s situation: What is the student trying to understand, do, revise, decide, or connect? What kind of support would help that student continue learning? Should that support come from AI, from another person, from course resources, or from independent effort?

Connection to HyFlex Design

HyFlex course design has long emphasized learner choice, equivalency, reusability, and accessibility (Beatty, 2019). These principles continue to matter. Yet students moving through different participation pathways encounter learning needs at different times and under different support conditions. A learner may need help during a live class, while watching a recording, while drafting an assignment, while revising from feedback, or while trying to make sense of a confusing concept late at night. Support needs do not arrive on schedule.

The thesis of this paper is that AIMON extends the HyFlex conversation by asking how timely, learner-centered support can be designed across flexible learning pathways while preserving the human, social, and agency-centered commitments that make HyFlex worth doing. Flexible learning should provide more than flexible access to instruction; it should provide flexible access to appropriate support across the learning process.

The HyFlex Challenge of Learner Support

HyFlex course design provides students with meaningful choices about how they participate in learning while working toward shared learning outcomes. The approach was developed to increase flexibility without creating separate courses or lowering expectations for any participation path (Beatty, 2019). Its central value is not simply convenience. HyFlex design supports learner choice, access, and continuity when work, family, health, travel, or other circumstances change.

Increased flexibility also creates a design challenge. Students participating through different modes may not have the same immediate access to instructor explanation, peer conversation, classroom cues, or informal clarification. An in-person learner may ask a brief question before class or test an emerging idea with a classmate. A synchronous online learner may have some of those opportunities, mediated by technology and session design. An asynchronous learner may encounter the same conceptual difficulty hours or days later without immediate access to either instructor or peers.

This does not mean HyFlex is deficient. Rather, it means learner support must be designed as carefully as content access. Equivalent learning is not only about equivalent materials, activities, or assessments. It is also about meaningful access to clarification, feedback, interaction, reflection, and help when learners need it. Moore's (1993) theory of transactional distance highlights the relationship among dialogue, structure, and learner autonomy, while the Community of Inquiry framework emphasizes cognitive, social, and teaching presence in meaningful online learning (Garrison et al., 2000). Both traditions point toward the importance of designing support conditions, not only delivering content.

AI enters this conversation as one possible support mechanism. It may help learners ask low-stakes questions, clarify next steps, practice ideas, interpret feedback, or make sense of course materials when instructors or peers are not immediately available. But AI should not be treated as a simple solution. The design question is not, "How do we add AI to HyFlex?" The better question is, "*How can we support learners at moments when flexibility makes support harder to provide, and when is AI an appropriate part of that support?*"

Why "More AI" Is the Wrong Starting Point

When a powerful new technology becomes available, it is tempting to begin with the technology itself. Educators may ask what AI can do, which tools should be used, whether students should be allowed to use AI on assignments, and how institutions should respond to AI-enabled academic misconduct. These questions are practical, but they are not sufficient to guide learning design.

More AI use does not automatically mean better learning. A learner may use AI frequently while avoiding the intellectual work of a course. Another may use AI briefly at exactly the right moment and gain meaningful clarity. The educational value of AI depends on purpose, timing, role, and context. Recent research reinforces this concern. Zhai et al. (2024), in a systematic review of overreliance on AI dialogue systems, identify risks to critical thinking, analytical reasoning, and decision-making. Darvishi et al. (2024), in a large peer-feedback study, found that students could come to rely on AI assistance rather than learn from it.

At the same time, the answer is not to reject AI support. Human-centered guidance emphasizes that educational use of generative AI should remain under human control, serve pedagogical purposes, and be considered in relation to non-AI alternatives (Miao & Holmes, 2023). Recent work on generative AI literacy likewise suggests that effective use involves metacognition, critical evaluation, context-sensitive judgment, and ethical boundaries rather than prompt skill alone (Yan et al., 2025). AIMON therefore begins neither from enthusiasm nor prohibition. It begins with the learner and the learning process.

Introducing AI in the Moment of Learning Need (AIMON)

AI in the Moment of Learning Need (AIMON) is a learner-first, learning-process-first framework for designing AI-supported learning. Rather than beginning with the capabilities of an AI tool and searching for places to use it, AIMON begins by asking what is happening for the learner: What are they trying to learn or accomplish? Where are they encountering uncertainty or difficulty? What kind of support would help them continue learning? Only then does AI enter the design decision.

AIMON is organized around seven principles that guide these decisions.

1. **Learning before tools.** The starting point is the learning need rather than the technology. AI is considered only after the desired learning, learner activity, and need for support have been identified.
2. **People before technology.** Learning remains a fundamentally human activity. AI should complement rather than displace relationships with instructors and peers, dialogue within learning communities, and the human judgment that gives learning meaning and context.
3. **Support rather than substitution.** AI should help learners engage in productive learning activity without performing the consequential thinking for them. Appropriate support may reduce unnecessary barriers, provide feedback, encourage reflection, or help a learner move forward while preserving responsibility for learning.
4. **Learner agency and meaningful choice.** Learners should retain meaningful control over whether, when, and how they use AI. AI support should be transparent and optional where possible, with viable non-AI pathways available rather than making AI use a hidden condition of successful participation.
5. **Critical thinking and human judgment.** AI-supported learning should continue to require learners to evaluate information, make decisions, exercise judgment, and take responsibility for the conclusions and products they create. AI may contribute information or perspective, but learners remain responsible for determining what to accept, reject, revise, or pursue.
6. **Access across learner pathways.** Support should be available across the different pathways through which learning occurs. This is particularly important in flexible and HyFlex environments, where students participating at different times, in different places, and through different modes may not have equivalent access to immediate human support.
7. **Reasoned non-use of AI.** AIMON does not assume that AI is the appropriate response to every learning need. At some moments, instructor interaction, peer collaboration, an existing resource, productive struggle, or independent work may better support learning. Choosing not to use AI is an intentional design decision when another form of support better serves the learner.

Together, these principles shift the central design question from "Where can we use AI?" to "What support does this learner need at this moment, and what form of support best serves the learning?" Sometimes the answer will be AI. Sometimes it will be another person, an existing learning resource, or an opportunity to work through difficulty independently. AIMON is therefore not primarily a framework for increasing AI use. It is a framework for making more intentional decisions about learner support in an increasingly AI-mediated learning environment.

AIMON and the Five Moments of Learning Need

AIMON also draws on performance-support traditions, especially Gottfredson and Mosher's (2011) Five Moments of Need. Their framework calls attention to the different forms of support people need when learning something new, expanding what they know, applying or remembering what they have learned, responding when something goes wrong, and adapting when conditions change. The underlying insight is especially important for AI-supported learning: support is most useful when it responds to the need a learner is experiencing at a particular moment.

AIMON extends this moment-of-need logic into course-based learning, particularly in flexible and HyFlex environments where students frequently encounter learning tasks outside the immediate presence of an instructor. In doing so, AIMON translates the original performance-oriented moments into five overlapping moments of learning need: new learning; applying and remembering; solving problems and getting unstuck; changing, revising, and improving; and deepening learning. These categories are not intended as a replacement for the original Five Moments of Need. Rather, they provide a learning-centered adaptation for identifying where support may be useful and for deciding whether that support should come from AI, another person, an existing resource, or the learner's own continued effort.

For each moment, the design task involves more than identifying what AI can do. Faculty and instructional designers should consider what the learner is experiencing, what learning activity should remain with the learner, what form of support would be useful, and whether AI is actually the most appropriate source of that support. In some situations, immediate AI assistance may help a learner continue. In others, peer dialogue, instructor guidance, an existing learning resource, or productive independent struggle may better serve the learning goal.

1. **New Learning:** Learners encountering a new concept need orientation, explanation, examples, and ways to connect unfamiliar ideas to what they already know. AI can offer alternate explanations, low-stakes questions, examples, or conversational clarification. The design risk is premature simplification: if AI summarizes away the complexity learners need to encounter, apparent clarity may replace meaningful engagement.

2. **Applying and Remembering:** Learners often need opportunities to retrieve, practice, and apply what they have learned. AI can generate practice questions, vary examples, offer hints, or support rehearsal. The critical question is whether AI helps the learner practice or bypasses the practice. If retrieval and application are the learning goals, immediate answers can undermine the very process the activity is intended to strengthen.

3. **Solving Problems and Getting Unstuck:** When progress stalls, learners may need diagnosis, a hint, a question, or help breaking a problem into manageable parts. AI can be useful as a just-in-time scaffold, especially when human support is not immediately available. Yet some struggle is productive. The goal is to remove unnecessary barriers without removing the reasoning, experimentation, and persistence through which learning develops (Kapur, 2008).

4. **Changing, Revising, and Improving:** Learners need support when feedback, new evidence, or changing conditions require them to revise their understanding or work. AI can help interpret feedback, surface alternatives, ask reflective questions, or identify issues for reconsideration. The learner should still make and justify the consequential revision decisions; having AI simply produce the revised product risks substituting for learning.

5. **Deepening Learning:** Learners sometimes need to move beyond competence toward synthesis, critique, connection, and inquiry. AI can help surface competing perspectives, challenge assumptions, generate questions, or support metacognitive reflection. Here, the most valuable role may be to create productive intellectual friction rather than to resolve uncertainty. Vendrell and Johnston (2026) similarly argue for designs that preserve cognitive friction, position large language models as provisional thinking partners, and sequence AI-mediated with AI-free phases.

Support Without Substitution

Identifying a moment of learning need does not by itself establish that AI should be used. The next design question is more fundamental: ***What learning work needs to remain with the learner?***

AIMON distinguishes between support and substitution. Support helps learners continue engaging in productive learning activity. It may help them prepare, interpret, rehearse, reflect, diagnose, revise, or persist. Substitution occurs when AI performs the central intellectual work the learner is expected to develop or demonstrate.

The distinction is contextual rather than technological. The same AI capability may function as useful support in one situation and inappropriate substitution in another. Asking an AI system to suggest questions that help a learner examine an argument may stimulate deeper analysis. Asking it to construct the argument on the learner's behalf may bypass the reasoning the activity was intended to develop. Feedback on the clarity of a draft may support revision, while having AI produce the revised submission may replace the learner's work.

Recent scholarship gives this distinction additional urgency. Vendrell and Johnston (2026) caution that unstructured generative AI use can encourage cognitive offloading, metacognitive disengagement, and reduced epistemic agency. Darvishi et al. (2024) similarly show that effective assistance can create reliance when learners do not internalize the supported process. AIMON therefore treats the preservation of consequential learner work as a design requirement rather than an after-the-fact integrity concern.

A useful AIMON design test is to ask:

- What thinking must the student do?
- What decisions must remain with the student?
- What difficulty is productive for learning?
- What difficulty is unnecessary or inequitable?
- What form of support would help without taking over?

These questions resist two opposite tendencies: treating any AI use as inherently harmful, and assuming that removing difficulty is inherently beneficial. Learning often requires effort, uncertainty, revision, and temporary failure. The goal is not to eliminate productive struggle but to distinguish it from barriers that contribute little to the intended learning (Kapur, 2008; Sweller, 1988).

This distinction is particularly important in flexible and HyFlex environments. Learners working asynchronously or at a distance may encounter uncertainty without immediate access to an instructor or peer. Timely AI support can sometimes prevent a minor obstacle from becoming disengagement. At other moments, waiting, struggling with an idea, consulting a peer, or seeking instructor feedback may provide greater learning value than receiving an immediate AI response.

Support without substitution therefore does not establish a universal boundary between acceptable and unacceptable AI use. Instead, it provides a way to reason about that boundary in relation to the learner, the learning goal, and the moment of need. The aim is not to maximize assistance. It is to provide enough of the right kind of support for learning to continue while preserving the thinking, judgment, and agency that make the learning consequential.

Designing the Support Ecology

If AIMON begins with the learner rather than the technology, identifying a need for support does not automatically lead to AI. Learners operate within an ecology of potential support that may include instructors and other human experts, peers and learning communities, designed course and external resources, AI, and independent effort. The design challenge is to determine which form or support, or combination of forms, is most appropriate for a particular moment of learning need.

AI is distinctive within this ecology because it can provide immediate, individualized, and conversational support at times when other forms of assistance may not be readily available. That capability can be especially valuable in flexible and HyFlex environments, but availability should not be confused with appropriateness. The fact that AI can respond immediately does not mean that an immediate AI response best serves every learning need.

Independent effort also belongs in the ecology. Not every moment of uncertainty requires intervention. Retrieval from memory, wrestling with ambiguity, testing an idea, attempting a solution, and deciding what one thinks before seeking assistance can all be valuable learning activities. Reasoned non-use therefore has a positive pedagogical meaning: sometimes the best support decision is not to intervene yet.

Human interaction remains qualitatively important. Instructor judgment, peer dialogue, mentoring, encouragement, disagreement, and collaborative meaning-making are not simply slower versions of information delivery. AIMON treats AI as a complement to this ecology, not a replacement for it.

See Figure 1 for a summary look at the way various aspects of the AIMON framework work together to help teachers and designers develop an effective learning support ecosystem for a given learning context.

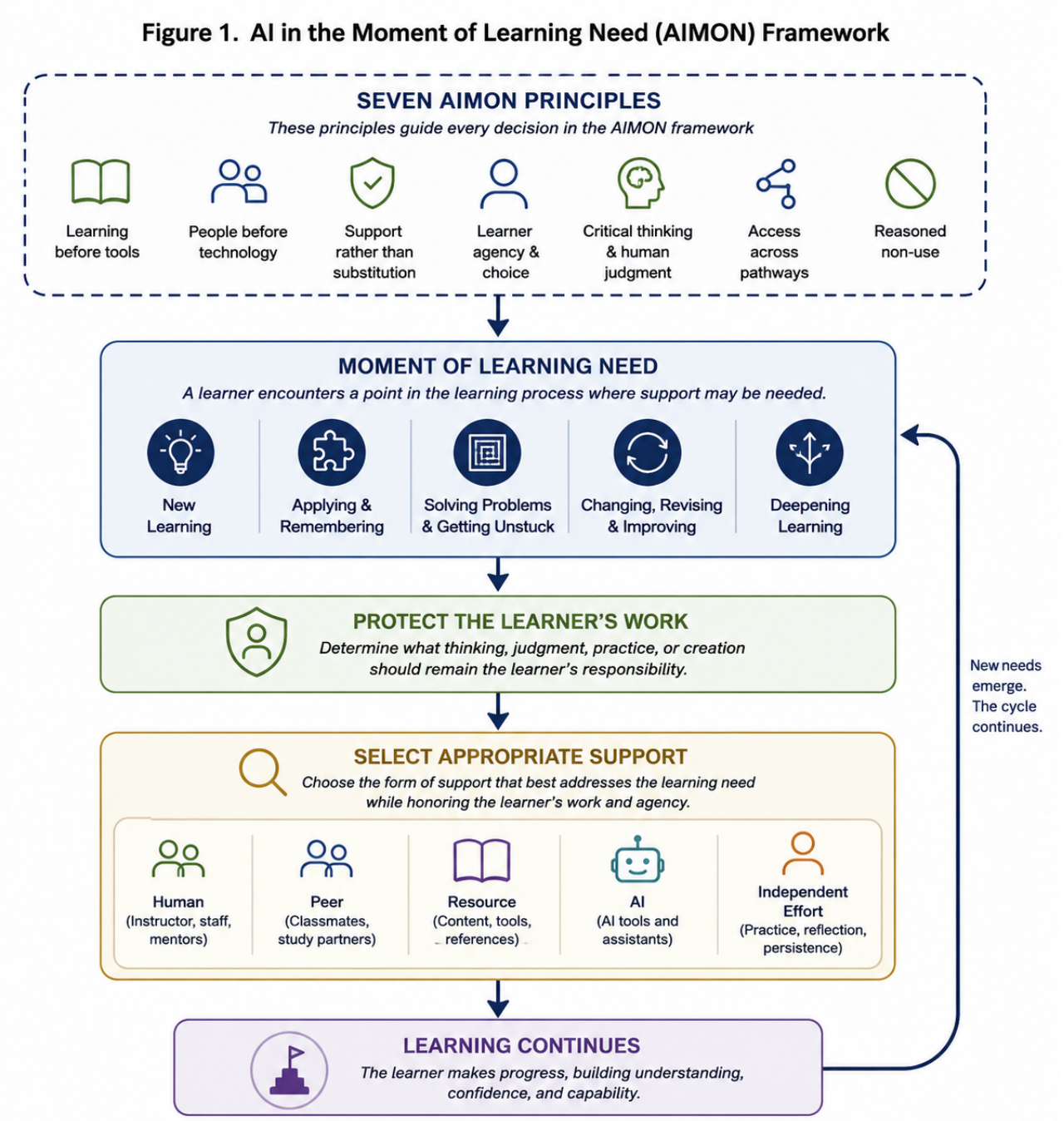

Figure 1. AI in the Moment of Learning Need (AIMON) Framework. *AIMON begins with the learner and a recognizable moment of learning need. Seven principles guide decisions about what learning work should remain with the learner and what form of support is most appropriate. AI is one option within a broader support ecology. The intended outcome is not AI use, but continued meaningful learning.*

From Framework to Practice: Course Examples and Early Student Evidence

The AIMON framework developed alongside efforts to design AI-supported learning across higher education courses with substantially different learners, goals, and instructional structures. (See Table 1.) These included a large asynchronous undergraduate course focused on learning with emerging technologies, a graduate seminar exploring emerging technologies and instructional design, and a graduate project-based course requiring students to apply instructional design knowledge to complex professional work. Working across these settings helped clarify an important

feature of AIMON: the same technology should not necessarily be used in the same way simply because it is available. The appropriate form of support depends on the learner, the learning task, and the moment of need.

Large Asynchronous Undergraduate Course

In the large asynchronous undergraduate course, a recurring challenge was access to timely support when students were working independently. Learners often needed clarification of expectations, help making sense of unfamiliar concepts, opportunities to rehearse ideas, or assistance getting started with complex assignments. AI-supported tools were therefore positioned primarily as optional sources of just-in-time clarification, practice, and sense-making. The intent was not to have AI complete assignments, but to provide another pathway to support when relatively small barriers might otherwise interrupt progress.

Graduate Seminar Course

The graduate seminar presented a different set of needs. Students were expected not only to understand emerging technologies but also to analyze their educational affordances, limitations, ethical implications, and potential applications. Here, AI could be positioned less as basic clarification and more as a thinking partner: a way to test an interpretation, encounter an alternative perspective, rehearse an argument, or examine assumptions before discussion or analysis. Because judgment and critique were central learning goals, students remained responsible for evaluating AI-generated information and reaching defensible conclusions.

Graduate Project-based Course

The graduate project-based context introduced still another pattern. Students engaged in extended design work involving problem framing, analysis, design decisions, prototyping, feedback, and revision. AI could help generate questions for further investigation, examine a design decision from another perspective, prepare for peer feedback, or reflect on revisions. At the same time, much of the value of project-based learning comes from making and defending consequential design decisions. Having AI make those decisions or produce substantial portions of the resulting design would risk substituting for the learning the project was intended to develop.

Across the three contexts, the strategy was not to provide unrestricted AI and assume productive use would follow. Particular forms of AI support were associated with recognizable learning needs. AI use was encouraged where it could provide useful scaffolding, but it was not required, and students remained responsible for the accuracy, originality, and quality of their work.

Context	**Illustrative moment of need**	**Possible support**	**Learning retained by learner**
Asynchronous undergraduate	Confused about a concept while working independently	AI clarification, alternate explanation, low-stakes practice	Interpret and apply the concept
Graduate seminar	Preparing to analyze or critique an emerging technology	AI as questioning, perspective-taking, or rehearsal partner	Evaluate evidence and form a defensible position
Graduate project/design	Reconsidering a design after feedback	AI-supported reflection, questions, or alternative perspectives	Make and justify consequential design decisions

Table 1. *Illustrative AIMON applications across three instructional contexts.*

Early Student Evidence

Because AIMON is fundamentally concerned with how learners experience and use support, the initial course implementations were accompanied by an exploratory student survey at the end of the Spring 2026 semester. The survey was not designed to establish the effectiveness of AIMON or test causal relationships. Rather, it provided an early opportunity to examine whether students' reported AI use resembled the patterns the framework was intended to support: using AI at particular moments of learning need, retaining responsibility for consequential thinking, and sometimes choosing not to use AI.

The cleaned pilot dataset included 39 substantive responses. Students most frequently reported using AI for planning and organizing work (29 respondents), understanding complex ideas (27), getting started (25), and receiving feedback (22). Twenty-two of 39 reported using AI often or very often to get unstuck. Thirty-five of 39 indicated that AI supported their learning without replacing their own thinking, and 30 of 39 reported that they sometimes chose not to use AI. These patterns are consistent with AIMON's emphasis on support rather than substitution, learner agency, and reasoned non-use.

These findings should be interpreted cautiously. Participation was voluntary, the data relied on self-report, and the course implementations were exploratory rather than controlled interventions. The results do not demonstrate that AIMON improves learning outcomes. They do suggest, however, that students can distinguish among purposes for AI use and can make intentional decisions about when AI contributes to, or detracts from, their learning.

From AIMON Principles to Design Practice

The AIMON principles describe a stance toward AI-supported learning, but principles become useful to practitioners only when they inform design decisions. Faculty and instructional designers do not necessarily need to redesign an entire course or create specialized AI tools to begin applying AIMON. A useful starting point is to identify a recurring moment in which learners need support and work through four questions.

1. **What is the learning need?** Begin with the learner rather than the technology. Where do learners commonly experience uncertainty, difficulty, or a need for additional support? The goal is not to identify an AI use case, but to describe the learning situation clearly enough to understand what is happening and why support might be useful.

2. **What should remain the learner's work?** Determine what activity is consequential for learning. What should the learner think through, practice, decide, create, or evaluate? What difficulty is productive, and what difficulty contributes little to the intended learning? This establishes the boundary between support and substitution.

3. **What form of support is appropriate?** Only after identifying the need and the work that should remain with the learner should the designer consider the source of support. Possibilities include an instructor or other human expert, peers, designed resources, AI, or additional independent effort. The AIMON decision is not simply whether AI can provide support, but whether it is the most appropriate support for this learner, task, and moment.

4. **How will learners understand and control the support?** When AI is incorporated, its role and boundaries should be visible. Learners should understand why the support is offered, what it is intended to help them do, what responsibility remains theirs, and where its limitations lie. Where possible, AI should be offered as a meaningful option rather than a hidden requirement. Reflection on these choices can itself support developing AI literacy (Yan et al., 2025).

Together, these four questions provide a practical AIMON design sequence: identify the learning need; protect the learner's work; select the appropriate support; and make the support visible and controllable. (See Figure 2.) The process may lead to an AI-supported activity, but it does not have to. A decision to strengthen peer interaction, clarify an existing resource, provide instructor guidance, or allow more time for independent effort can be an equally successful application of AIMON. The measure of a good design decision is not whether AI was used. It is whether learners received appropriate support while remaining meaningfully engaged in the learning they needed to do.

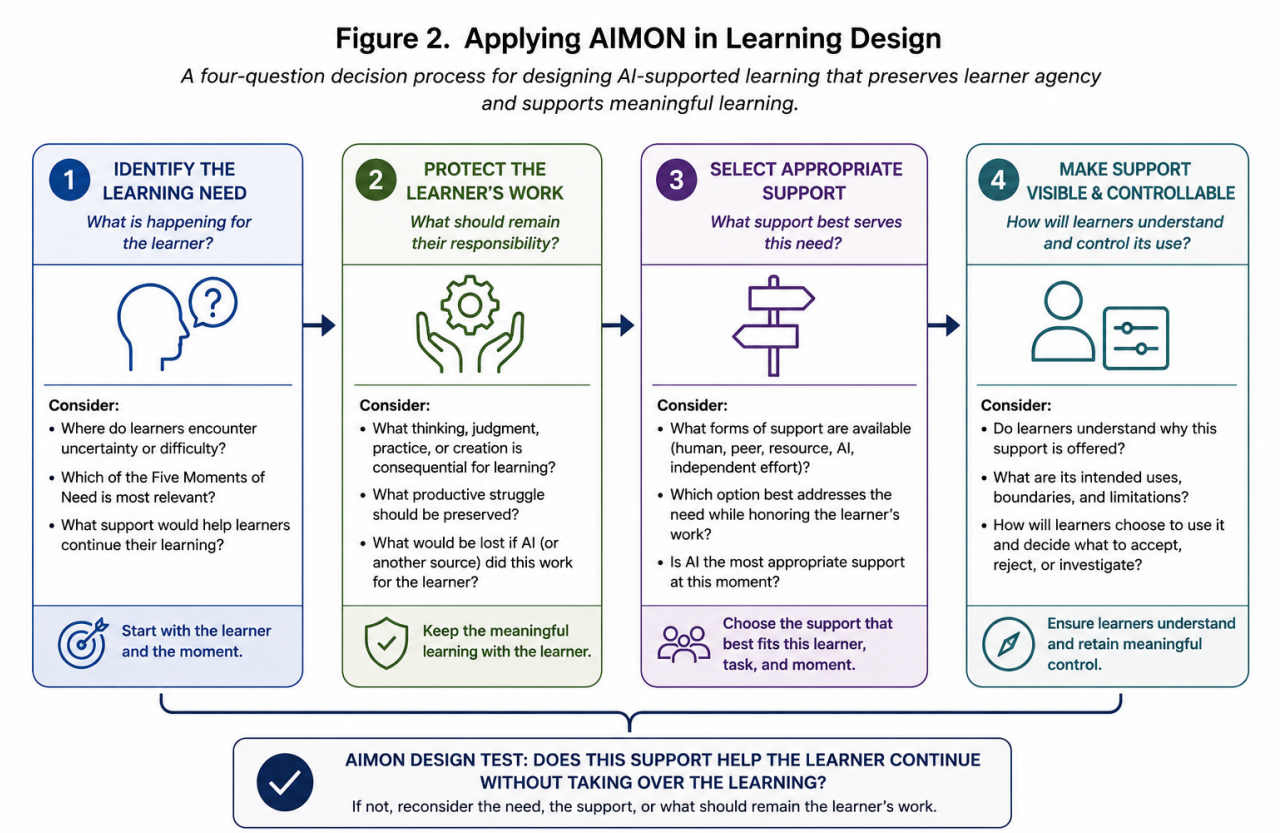

Figure 2. Applying AIMON in learning design. *Practitioners identify a learning need, determine what consequential activity should remain with the learner, select the most appropriate source of support, and ensure that learners understand and retain meaningful control over that support. The process may result in an AI-supported design, but AI use is not assumed.*

A Brief Worked Example: General context (See Table 2.)

AIMON question	**Example: Student struggling to develop a design rationale**
What is the learning need?	The student has made a design choice but is struggling to articulate why it fits the learner and context.
What should remain the learner's work?	Connecting evidence, context, and design judgment into a defensible rationale.
What support is appropriate?	AI can question assumptions, ask for evidence, identify gaps, or offer a competing perspective; a peer or instructor could also provide critique.
How will learners understand and control it?	The student chooses whether to use the support and decides what feedback to accept, reject, or investigate.
What should AI not do?	Write the final rationale or make the consequential design decision.

Table 2. *Worked example of the AIMON design questions.*

Implications for HyFlex and Flexible Learning

AIMON has implications for learning design broadly, but the framework may be particularly relevant in HyFlex and other flexible learning environments. (See Table 3.) HyFlex design has traditionally focused on providing learners with meaningful choices among participation pathways while maintaining equivalent opportunities to achieve shared learning outcomes (Beatty, 2019). As these environments mature, equivalency may need to be considered not only in terms of access to content, activities, and assessment, but also in terms of access to appropriate support across the learning process.

Students participating in different modes do not necessarily encounter the same conditions for receiving help. An in-person learner may ask an instructor a brief question before class, notice the confusion of classmates during an explanation, or test an emerging idea informally. A synchronous online learner may have access to some of those interactions. An asynchronous learner working independently may encounter the same conceptual difficulty hours or days later. The instructional content may be equivalent while the support environment is not.

Equivalency

AIMON suggests that flexible learning design should therefore consider support across learner pathways as an additional dimension of equivalency. This does not mean that every learner must receive identical support or that AI should make every pathway function in the same way. Equivalent support does not mean identical support. Rather, learners should have meaningful opportunities to obtain the kinds of support needed to continue learning, even when those supports take different forms across modes.

Generative AI introduces new possibilities within this ecology because it can provide conversational and responsive assistance independent of time and place. Yet using AI simply to fill every gap in human availability would conflict with AIMON's learner-first orientation. Human interaction is not merely a slower version of information delivery. Instructor judgment, peer dialogue, social presence, mentoring, encouragement, disagreement, and collaborative meaning-making contribute forms of support that AI does not simply reproduce.

Learner Choice

This perspective also extends the HyFlex principle of learner choice. Meaningful flexibility concerns more than where or when students participate. Learners increasingly make choices about the resources, technologies, and forms of assistance they use while learning. An AIMON-informed HyFlex environment can make AI support available without making AI use a condition of successful participation.

Accessibility

Accessibility likewise takes on a broader meaning. AI may reduce some barriers by providing alternative explanations, opportunities for rehearsal, language support, or assistance when human support is unavailable. Yet AI can introduce new barriers related to cost, access, disability, language, privacy, technical literacy, or uneven system performance. Human-centered guidance therefore remains essential (Miao & Holmes, 2023).

Reuse, or Sustainability

Finally, AIMON has implications for sustainability. Faculty cannot be continuously available across every learner pathway and every moment of need. Thoughtfully designed AI or resource-based support may address some recurring needs, allowing faculty time to be directed toward forms of teaching where human expertise, judgment, and relationship matter most. Workload reduction, however, should not become the primary rationale for AI use. The relevant question remains whether the support arrangement improves the learner's opportunity to continue meaningful learning.

HyFlex principle	**AIMON lens on learner support**
Learner Choice	Learners have meaningful choices about whether, when, and how they access AI-supported assistance.
Equivalency	Different participation pathways provide meaningful opportunities to obtain appropriate support, although the form of that support need not be identical.

HyFlex principle	AIMON lens on learner support
Reusability	Intentionally designed supports can remain available across times, contexts, and participation pathways rather than being recreated for each mode.
Accessibility	Support reduces barriers to learning without introducing new barriers related to AI access, cost, privacy, technical literacy, language, or ability.

Table 3. *HyFlex principles interpreted through an AIMON learner-support lens.*

From this perspective, AI does not require HyFlex educators to abandon the principles that have guided flexible learning. It creates an opportunity to extend them. Learner choice can encompass choices about support. Equivalency can include meaningful access to support across pathways. Accessibility can include timely assistance while guarding against new forms of exclusion. Reusability can include intentionally designed supports that remain available across time and participation modes.

AIMON therefore reframes the relationship between AI and HyFlex. The question is not how HyFlex should adapt to the arrival of AI, but how emerging AI capabilities might be incorporated selectively into an already learner-centered approach to flexible learning. Flexible learning should provide more than flexible access to instruction; it should provide flexible access to appropriate support across the learning process.

Conclusion

Generative AI creates new possibilities for supporting learners in flexible and HyFlex environments. It can provide immediate clarification, practice, feedback, rehearsal, and reflection support at moments when students may otherwise be working alone. At the same time, research on overreliance, cognitive offloading, and student agency cautions against equating more assistance with better learning (Darvishi et al., 2024; Vendrell & Johnston, 2026; Zhai et al., 2024).

AIMON offers a framework for navigating this tension. It begins with the learner's moment of need, not with the tool. Seven principles establish the framework's commitments; five moments of learning need help identify where support may matter; the support-without-substitution distinction protects consequential learner work; and the support ecology keeps AI in relationship with human expertise, peers, designed resources, and independent effort.

For practitioners, AIMON can be applied through four questions: 1) What is the learning need? 2) What should remain the learner's work? 3) What form of support is appropriate? 4) How will learners understand and control that support? These questions deliberately allow for different outcomes. Sometimes AI will be useful. Sometimes another person, a resource, or continued independent effort will better serve learning. Reasoned non-use is therefore not resistance to innovation; it is part of responsible learning design.

For HyFlex educators, AIMON extends the existing commitment to learner choice, equivalency, reusability, and accessibility. It asks us to think not only about how students access learning opportunities across participation modes, but also about how they obtain meaningful support across those pathways. Equivalent learning should include access to support, not only access to content.

The early student evidence reported here is encouraging but preliminary. Students described using AI for recognizable moments of learning need, reported that AI generally supported rather than replaced their thinking, and frequently described choosing not to use AI. Future research should examine how AIMON-informed designs affect learning processes and outcomes across different learners, disciplines, participation modes, and forms of AI support.

The goal is not more AI use. The goal is better learner support.

The intended outcome is not AI use, but continued meaningful learning.

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