

Council on Future Practice

AI and Learning

Backgrounder

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Introduction

Artificial intelligence (AI) is increasingly shaping how people learn, access information, and develop new skills. AI-powered tools can analyze patterns in how individuals engage with content and use that information to personalize learning experiences, recommend resources, and provide real-time feedback. From adaptive learning platforms to conversational assistants, these technologies are making education more interactive and responsive to individual needs. As AI continues to evolve, educators across disciplines are exploring how it can support teaching and learning while also considering ethical implications, accuracy, transparency, and the role of human guidance.

Registered Dietitian Nutritionists (RDNs) and Nutrition and Dietetics Technicians, Registered (NDTRs) may utilize AI in formal education, professional development, and personal learning spaces. In all of these environments, AI has transformed learning from a “one-size-fits all” model to one that can adapt in real time, adjusting design, delivery, pacing, depth, examples, and feedback.

This backgrounder examines the evolving landscape of AI and learning and its implications for RDNs and NDTRs. It includes considerations for both dietetics education and professional development. It is designed as an internal resource for members of the Academy and organizational leaders, providing an evidence-based overview of:

- Types of AI and how it is being used in learning environments, including adaptive learning platforms, generative AI, agentic AI, intelligent tutoring systems, and predictive analytics.
- How AI can support personalized learning, improve access to information, and enhance teaching strategies.
- The roles of both the educator and the learner in evaluating AI tools for accuracy and bias, understanding the tool’s role, and following principles of responsible use.

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Trends in AI and Learning

AI is reshaping how learning occurs in dietetics education and professional development. Rather than relying on traditional “one-size-fits-all” courses, AI systems can support learning experiences that adapt in real time to an individual’s needs based on how a learner is engaging with the material. For students and professionals, AI tools are evolving beyond simple fact delivery to being reflective partners, helping learners think through complex nutrition cases, interpret emerging research, or consider different approaches to patient counseling and behavior change. At the same time, learning is becoming more embedded in everyday practice. Instead of seeking education separately through formal courses, students and professionals will encounter AI-supported guidance within the tools they already use, such as electronic health records, menu-planning software, or patient communication platforms.

Alongside these changes, continuing education models are also evolving. AI-enabled assessment can support competency-based microcredentials in areas such as nutrition counseling, chronic disease management, or culturally responsive care, where success is based on demonstrated skills and applied knowledge rather than the number of hours spent in a course. Together, these developments point toward more personalized, integrated, and skills-focused learning for the nutrition and dietetics practitioner.

How AI Learns

AI refers to computer systems that can perform tasks that typically require human intelligence, such as recognizing patterns, generating text, or making predictions based on data. AI systems are trained on large datasets to identify patterns and relationships and are described by their capabilities and functions. There are three AI capabilities: 1) **Artificial Narrow Intelligence** which can’t function outside an assigned task (currently the only AI capability that exists) 2) **Artificial General Intelligence** which is only a theoretical concept in which AI could use past learnings to complete new tasks without human instruction and 3) **Artificial Superintelligence** (also a theoretical concept) in which AI evolves beyond human inputs to have its own emotions, needs, and beliefs⁹. In terms of functionality, AI can be categorized as:¹⁰

- **Reactive:** Responds to specific inputs without learning from past experiences. Examples: Voice-based home assistants or robotic vacuums.
- **Predictive:** Uses historical data to predict future behaviors. Examples: Online shopping or entertainment sites offering suggestions; credit-scoring tools.
- **Generative:** Creates new text, images, videos, or other content based on existing data patterns and structures.
- **Agentic:** Expands beyond creating content to work independent of specific user-prompts; “capable of planning, reasoning, adapting and acting independently to achieve user-defined or self-motivated goals.” In academic settings, agentic AI can function as “tutors, coaches, collaborators, teaching assistants or co-learners”.¹²

In academia, AI systems learn by analyzing very large sets of student performance data, as well as institutional level data to create learning experiences that are more efficient, personal, and available 24/7.⁸ The resulting AI solutions are then delivered as **student-focused** (tutoring systems, writing evaluation systems, chatbots), **teacher-focused** (assessment tools, resource curation systems, lesson planning tools), **institution-focused** (operations and administration, scheduling, assessing students at risk), and **systems-focused** (tracking and projecting state/national level assessments data/trends and mapping to funding).¹⁵

Regardless of the use cases, the key to application is AI governance. **AI governance** is the policies, ethical guidelines, accountability and control mechanisms, and more, that guide the responsible and secure use of AI in teaching, research, and administration¹⁹.

Limitation, Threats, and Concerns of AI in Learning

The limitations and concerns of AI in dietetics education and professional development are centered around **learning quality, ethics, equity, and practical implementation**. It is important to understand that AI does not completely “think” or “understand” content. Whether generating responses to prompts or initiating activities based on available data, AI systems rely on data availability and patterns and can produce inaccurate or misleading information. Content generated from AI tools cannot replace peer-reviewed sources or independent analysis. The human verification steps are always required, especially in anticipating potential limitations of the AI tools.

Potential limitations/threats/concerns include:

- **Data bias:** AI systems are built by humans and rely on data generated by human-built systems, thus they have the same problems with bias and inaccuracies. Since AI cannot reason the way a human does, it can be more prone to errors of bias¹⁵.
- **Misinformation/hallucinations:** AI systems can include incorrect data based on the information that is available for analysis, the method of analysis, and more. A “hallucination” is when an AI output contains false or misleading information presented as fact based on what AI determines is the statistical probability of being the “right” response¹⁸. Generative AI tools have also been

documented in creating fake abstracts, papers, and bibliographies, often referred to as “ghost-references.”²⁰

- **Misdiagnosis/incorrect treatment:** While AI has been shown to generate components of a care plan, it can misplace parameters and not be able to determine causal relations between symptoms/conditions. Other challenges include not using correct or relevant terminology, lack of transparency of sources used for clinical recommendations, and of most concern, misdiagnosis or false diagnosis/fabrication².
- **Cognitive offloading:** A user’s reliance on external tools or technologies that reduce the need for thinking and remembering is referred to as cognitive offloading. While information accessible through AI puts information at learners’ fingertips, habitual use may lead to a decline in memory capabilities and less information being internalized for future recall.¹
- **Academic dishonesty:** The language models behind AI tools lack true comprehension, critical analysis, and personal perspective required for genuine scholarly writing. As a result, they raise concerns about academic integrity, since the work may not reflect the author’s own thinking or original ideas.³ The ease in which information can be accessed combined with AI’s ability to generate coherent and relevant responses that can be adapted to a person’s voice and writing style, can make it more difficult to parse out AI versus student work.⁶

Opportunities for AI as a Learning Support Tool

Despite the potential limitations and concerns, when used appropriately, AI can support both dietetics education and professional development by enhancing learner understanding and boosting overall learner efficiency. Faculty, preceptors, or supervisors, play a critical role in shaping responsible AI use when they gain competence with the tools. They can design assignments that emphasize reasoning, application, and reflection, teach students how to critically evaluate AI outputs, model ethical and transparent AI use, and clearly communicate expectations and policies related to AI. These discussions and modeling of best practices are critical to helping students understand when and how it is appropriate to use AI.

Examples of appropriate academic uses for dietetics students and professionals include translating complex nutrition science into clear, client-friendly language, generating practice questions or clinical case scenarios (e.g., diabetes management, renal nutrition, or counseling sessions), and outlining research papers, case studies, or presentations. AI can also support improvements in organization, grammar, and clarity of writing for assignments, chart notes, or patient education materials, while ensuring that all final content reflects the dietitian’s own clinical judgment and expertise.

One documented example of the application of AI to learning in dietetics is the use of virtual simulated patients (VSPs). The Authentic Teaching and Learning Application Simulation (ATLAS) platform uses generative AI and VSPs to help nutrition and dietetics students practice and develop their communication and clinical reasoning skills. ATLAS allows students to interact with VSPs through voice-to-chat-based conversations that

provide an authentic learning experience and immediate personalized feedback. Students can practice skills like rapport building, asking difficult questions, paraphrasing, and learning from mistakes. ATLAS provides detailed feedback to students, encouraging self-reflection and improvement through repeat attempts.⁴ A similar platform, the E+DIETing Lab offers students the opportunity to “interact with virtual patient chatbots designed to simulate diverse clinical nutrition scenarios.”⁵ E+DIETing Lab is offered in multiple languages and each of the simulated patients has a clinical history, anthropometric and biochemical data, a dietary assessment, and a chatbot to simulate patient-provider dialogue. Similar to ATLAS, there are built-in self-assessment questions.

Another AI use in dietetics education and professional development is the inclusion of training on personalized nutrition AI tools. These tools use real-time data and predictive modeling to “optimize nutritional strategies, anticipating and modifying dietary plans based on the changing health needs of individuals, delivering data-informed solutions that are tailored to specific individuals”.¹¹ Data models and predictive analytics are also being used to enhance the efficacy of nutrition interventions in chronic disease prevention and management programs.¹³

In the professional development space, AI can help nutrition and dietetics practitioners turn broad goals (e.g., “get better at diabetes counseling” or “expand into gut health”) into structured learning plans, identify gaps in clinical or counseling skills, and recommend a logical sequence for building competencies (such as foundational pathophysiology before advanced medical nutrition therapy or behavior change strategies). Workforce development AI applications include mapping dietetics roles (clinical, community, food service, industry) into specific skill clusters like motivational interviewing, data interpretation, or regulatory knowledge. AI can also help highlight transferable skills across practice areas and identify gaps between current competencies and emerging needs (such as digital health tools, personalized nutrition, or AI-informed nutrition care).¹⁶

Skills for Students and Professionals

Current and future applications of AI in dietetics education and professional development will require RDNs, NDTRs, and students to achieve AI literacy and fluency. This will better enable them to effectively communicate and collaborate with AI systems, interpret results, detect potential errors, and talk clearly with patients about the benefits and limitations of AI.¹⁷ This model of “task-shifting and collaboration” versus replacement can allow nutrition practitioners to shift routine tasks to AI and instead focus on higher-level clinical decision-making and complex patient care.¹¹

RDNs, NDTRs, and students need to be skilled in prompting and question framing. These prompt engineering skills are now being referred to as the “new search literacy”¹⁴ and there are tools to help. For example, The CLEAR (Concise, Logical, Explicit, Adaptive, and Reflective) Framework centers on each element of prompt engineering. It is rooted in trying to overcome common challenges with using generative AI like getting

context-appropriate responses and is flexible for use with different AI language models and educational scenarios.¹⁴

Critical thinking remains central to using AI in learning environments, including maintaining data privacy, questioning AI outputs, recognizing bias, and validating information against evidence-based practice. Equally important are skills in prompt design, allowing learners to ask better questions and guide AI toward meaningful, context-specific insights. Ethical awareness, and a commitment to professional judgment ensure that AI is used responsibly and does not replace human expertise.

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