Fostering AI Literacy: A Guide for Educators in Higher Education

Fostering AI Literacy: A Guide for Educators in Higher Education

FANG YI; JESS TAGGART; AND BETHANY MICKEL

UNIVERSITY OF VIRGINIA
CHARLOTTESVILLE, VIRGINIA

Contents

Level 3: Evaluate and Create AI

Course Design and Adaptation

ABOUT THIS RESOURCE

Introduction

The emergence of generative AI in higher education has proven a transformative force, and educators are increasingly seeking resources to navigate this complex landscape. In response to this demand, our team embarked on a rigorous **Scholarship of Teaching and Learning (SoTL)** research project to develop an **Open Educational Resource (OER)** tailored to the unique needs of higher education instructors.

Our OER represents a collaborative effort to empower educators with the knowledge, skills, and resources needed to effectively integrate AI in higher education. By leveraging the benefits of open education and embracing a research-informed approach, we aim to support instructors in harnessing the transformative potential of AI to enhance student learning outcomes and foster innovation in teaching and scholarship.

Please note that this content will continue to evolve as we add new material and make revisions. Any changes will be tracked in the versioning notes.

In order to better understand the reach of this OER and potential use cases, we ask users to complete an enquiry form. Thanks for your participation.

Why Develop It?

The benefits of OER in the context of AI integration are substantial. Traditional educational materials often struggle to keep pace with rapid advancements, leaving instructors without adequate support.

Our comprehensive review of existing AI-related OER revealed critical gaps: many resources lacked a research-informed approach, failed to address the specific needs of instructors, and provided insufficient guidance on navigating the plethora of available AI tools and materials. This open text fills in those gaps and provides a valuable and evolving resource for instructors.

Who Is It For?

Our OER guide is designed to meet the needs of a diverse audience within higher education. While primarily targeted at faculty and instructors seeking to integrate AI into their teaching practices, the guide is also valuable for educational leaders, curriculum developers, instructional designers, and anyone interested in the ethical, critical, and effective integration of AI in higher education. Furthermore, educators across various disciplines will find the guide adaptable to their specific contexts, ensuring its broad relevance and applicability.

Who Developed It?

This research team is comprised of educational developers, faculty, graduate students, instructional designers, media specialists, and educational technologists from George Mason University, James Madison University, Bridgewater College, and the University of Virginia.

Throughout the development process, we actively engaged with key stakeholders across the state of Virginia to gather feedback and

insights, fostering a collaborative and iterative approach to guide refinement. The contributions of these higher education faculty, staff, and students have made our work better, and we are grateful for their perspectives and their time.

How Did We Develop It?

We conducted an extensive review of scholarly literature published between 2023 and 2025, synthesizing key insights and emerging trends in AI integration within higher education. Building upon this foundation, we iteratively developed and refined the content of the OER guide, incorporating feedback from instructors who participated in pilot testing and usability evaluations. This iterative process allowed us to address instructors' specific needs, enhance the OER's usability, and ensure its alignment with best practices in AI-enhanced pedagogy.

The Role of AI in Development

Our research team did all core development work for this OER. We used generative AI tools in strategic but limited ways to support the development of this resource, including:

- Brainstorming; e.g., generating ideas for learning objectives and reflection questions
- Summarizing; e.g., extracting key takeaways from articles and videos
- Generating images

- Enhancing accessibility
- Maintaining stylistic consistency across authors

All content has been carefully reviewed, edited, and approved by human authors. The authors—and those whose work is cited or shared—retain full responsibility for the accuracy, integrity, and scholarly merit of the content presented here.

AI tools hold tremendous potential for advancing the development of OER. Research indicates that these tools can save significant time and effort in developing resources [1], allowing educators and content creators to focus on areas where human expertise—such as creativity and collaboration—are needed [2]. Additionally, AI technologies provide scalable solutions to increase access to high-quality educational materials, making it easier to address diverse learning needs globally [3].

Beyond efficiency, AI introduces opportunities for personalization and accessibility in OER. Machine learning algorithms can adapt content to suit individual learners' needs, enabling differentiated instruction at scale. AI can also generate alternative formats such as audio descriptions, transcripts, or simplified text, making resources more inclusive for all learners. Moreover, AI-powered platforms facilitate the discovery and remixing of OER, helping educators identify relevant materials and adapt them to specific cultural or

1. Lalonde, 2023
2. Mills et al., 2023, p. 17
3. Gupta, 2023; OER Africa, 2023

pedagogical contexts, ultimately enhancing the relevance and impact of these resources [4].

4. OpenAI, 2022

How to Use This Resource

How to Use This Resource

OER are educational materials available for use, remixing, and redistribution. These resources encompass a wide range of content types, including textbooks, lesson plans, videos, quizzes, and interactive simulations. What sets OER apart is their open licensing, which typically allows users to retain, reuse, revise, remix, and redistribute the materials without encountering legal or financial barriers. In this section, we'll provide you with detailed instructions on how to use, adapt, and contribute to this resource.

Overview of Open Educational Resources (OER)

To better understand the potential of this text for use and adaptability, it's important to gain a working understanding of the principles of OER. If this information is familiar, please feel free to skip this portion.

OER are educational materials available for use, remixing, and redistribution. These resources encompass a wide range of content types, including textbooks, lesson plans, videos, quizzes, and interactive simulations. What sets OER apart is their open licensing, which typically allows users to retain, reuse, revise, remix, and

redistribute the materials without encountering legal or financial barriers.[1]

How OER Works

- Creation and Curation: OER are created by educators, scholars, and content creators who develop educational materials and release them under open licenses. These materials can be newly created resources or existing materials that have been repurposed for open sharing.

- Licensing: OER are typically licensed under Creative Commons licenses, which specify the permissions granted to users. Common licenses for OER include CC BY (Attribution), CC BY-SA (Attribution-ShareAlike), CC BY-NC (Attribution-NonCommercial). These licenses allow users to freely access, use, and modify the materials while providing appropriate attribution to the original creators. The CC0 (Public Domain Dedication) license indicates content creators have dedicated their work to the public domain without need for attribution.

- Access and Distribution: OER are freely accessible to anyone with an internet connection. They can be shared and distributed through various channels, including institutional repositories, open educational platforms, and individual websites. Users can download, view, and interact with OER without encountering access restrictions or paywalls.

- Adaptation and Modification: One of the key features of OER is their adaptability. Users are encouraged to modify and

1. https://creativecommons.org/share-your-work/cclicenses/

customize the materials to suit their specific needs and preferences. This may involve translating content into different languages, updating information to reflect current developments, or tailoring resources to align with specific educational objectives.

- Sharing and Collaboration: OER foster collaboration and knowledge sharing among educators and learners. Users can share their modifications and adaptations with others, contributing to a collective pool of resources that benefits the broader educational community. This collaborative ethos promotes innovation, diversity, and inclusivity in education.

By leveraging the principles of openness, collaboration, and accessibility, OER empower educators to create, share, and adapt high-quality educational materials that enhance teaching and learning experiences for all learners, regardless of geographic location or socioeconomic status.

Use

Whether you're a faculty member looking to integrate AI into your teaching practice or an educational leader seeking to share resources with your institution, this guide is designed to support your needs. This text is structured to be read from beginning to end, but it does not have to be; you are welcome to skip to the chapters that most interest you.

We have also found that the OER is also an excellent scaffold for a learning community; we encourage you to find others with whom to read the OER and discuss ideas.

Adapt

OER function within a framework of openness and collaboration, facilitated by digital technologies and open licenses.

Our License

This OER guide is published under a Creative Commons license, specifically the CC BY NC SA license. This means:

- Attribution: You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

- Non-Commercial: You may not use the material for commercial purposes .

- ShareAlike: If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.Adapting and modifying the content of this OER guide is encouraged to meet the specific needs of your context. This text was created in Pressbooks, and open-source platform designed for creating and publishing digital books. Due to its ability to distribute content in a variety of digital formats (including PDF, EPUB, MOBI, and other web-based formats), it is agile authoring and distribution tool for OER.

To learn more about adaptation and modification, we encourage you to review the chapter "Clone a Book" in the Pressbooks User Guide.

While we have used Pressbooks to create this book, you are free to use this material in any authoring platform you choose.

How to Adapt/Modify the Content

Adapting and modifying the content of this OER guide is encouraged to meet the specific needs of your context. This text was created in Pressbooks, an open-source platform designed for creating and publishing digital books. Due to its ability to distribute content in a variety of digital formats (including PDF, EPUB, MOBI, and other web-based formats), it is an agile authoring and distribution tool for OER.

To learn more about adaptation and modification, we encourage you to review the chapter "Clone a Book" in the Pressbooks User Guide.

While we have used Pressbooks to create this book, you are free to use this material in any authoring platform you choose.

You will encounter interactive H5P content throughout this text. At the present time, the option to embed or download this content into your own work is disabled. Once we have finalized the content, those settings will be modified to make all content truly open. Stay tuned!

Best Practices for Adaptation and Modification

When adapting or modifying this OER guide, consider the following best practices:

- Ensure that your modifications align with the learning objectives and goals of the original content.
- Provide clear explanations or annotations for any significant

changes or additions you make.
- Respect the integrity of the original content and avoid misrepresenting the author's intentions or ideas.
- Incorporate diverse perspectives and inclusive language to enhance the accessibility and relevance of the content.

Contributions

We welcome contributions to this resource.

You might consider:

- Suggesting Resources
- We welcome the addition of articles, books, websites, or tools that you believe would enhance this text.
- Submitting Examples of Classroom Applications
- If you have created an activity, assignment, or syllabus that includes application of AI, please consider sharing.
- Providing Feedback
- We welcome feedback on existing resources on our list, including any updates or corrections you think necessary.

Authors and Contributors

SoTL Project Overview

The Virginia MegaSoTL Research Project investigating the impacts of artificial intelligence (AI) tools on teaching and learning was established in Fall 2023. This collaborative research initiative, funded by a $93,000 Fund for Excellence and Innovation Grant from the State Council of Higher Education for Virginia, brings together faculty, graduate students, and staff from institutions across Virginia to explore various AI-related sub-topics in higher education.

Our team, "OER for Teaching with AI," emerged from the MegaSoTL project with the goal of designing, developing, and evaluating an adaptable Open Educational Resource (OER) to help faculty and instructors develop AI literacy for themselves and their students. Our team consists of educational developers, faculty, graduate students, instructional designers, media specialists, and educational technologists from George Mason University, James Madison University, Bridgewater College, and the University of Virginia.

Project Team:

OER Research Sub-Team

Sevinj Iskandarova, Katya Koubek, Jess Marquardt, Jess Taggart, Bisi Velayudhan, and Fang Yi

This sub-team is responsible for research and design

implementation, participant recruitment, data collection and analysis, and evaluation and reporting.

OER Content Sub-Team

Tim Ball (Content Reviewer), Bethany Mickel (Author, Editor), Karolina Naranjo-Velasco (Content Reviewer) Jess Taggart (Author, Editor), and Fang Yi (Author, Editor)

This sub-team is responsible for literature and resource review, content curation, drafting and development, and content evaluation and revision.

Previous Contributors

Josh Thorud – OER Content Lead (Fall 2023 – Fall 2024)

Jaira Ferreira de Vasconcellos – Content Reviewer (Fall 2023 – Winter 2025)

Professional Acknowledgements

We would like to thank the following:

- This project is supported by a Fund for Innovation and Excellence (FFEI) grant from the State Council for Higher Education of Virginia (SCHEV) and a SoTL Collaboration Grant from the Center for Teaching Excellence at the University of Virginia.
- We would also like to thank our research participants, colleagues, institutions, and all those who contributed their

feedback, expertise and support to this project.

About the Contributors

Fang Yi (Author; Overall Project Lead)

Fang (she/her) is the Assistant Director and Senior Instructional Designer for Learning Design and Technology at the College and Graduate School of Arts and Sciences, University of Virginia. In her role, she leads faculty development initiatives and provides both technical and pedagogical support for integrating instructional and learning technologies to achieve course objectives. Her work also includes exploring the application of AI tools, evaluating their effectiveness, and facilitating their integration across disciplines, with a special focus on language teaching. Her current research interests include AI literacy, effective and ethical AI integration, equitable and inclusive course design, and alternative assignments and assessments design. Fang holds a MA in Instructional Technology and Media from Teachers College, Columbia University, a MS in Communication and Information Systems from Peking University and a BE in Communication Engineering from Jilin University in China.

Bethany Mickel (Author; OER Content Lead)

Bethany (she/her) is the Instructional Design & OER Librarian at the University of Virginia. Her work involves facilitating open education initiatives and collaborating with faculty, staff, and students on open projects. Her work also includes the development of online resources to support library instruction. With a background in instruction design, her research interests include Open Pedagogy, Universal Design for Learning, the intersectionality of information and media literacy, as well as project-based learning as a means of assessment. She is a passionate practitioner of inclusive design and pedagogy and seeks ways to make learning accessible and welcoming for all. She holds an MLIS from Kent

State University, an MS in Instructional Technology from Bloomsburg University, and an BS in Secondary English Education from Lock Haven University.

Jessica Taggart (Author; Principal Investigator, MegaSoTL Project)

Jess (she/her) is an Assistant Director in the Center for Teaching Excellence at the University of Virginia, where she supports instructors in the scholarship of teaching and learning (SoTL) and curriculum (re)design. Her work also includes supporting instructors in navigating whether and how to integrate generative AI in the classroom, and she is committed to including student voices and perspectives in these conversations. Her current research explores the thoughtful integration of generative AI into teaching and learning. She is co-principal investigator of a cross-institutional SoTL project on this topic, bringing together seven teams of faculty, graduate students, and staff across higher education institutions in Virginia. She holds a PhD in Psychology from the University of Virginia and a BA in Psychology and English from Johns Hopkins University.

Sevinj Iskandarova (Research Lead)

Sevinj (she/her) is an Assistant Professor at the Nolen School of Business and Professional Studies at Bridgewater College. Her research interests encompass Leadership, System Leadership, Experiential Learning, Artificial Intelligence in Higher Education, and Artificial Intelligence Regulations and Policies. Dr. Iskandarova dedicated a decade to the higher education sector, where she held various management and leadership positions. Her roles focused on youth programs, international higher education, credit transfer systems, collaboration with both national and international higher education leaders. Throughout her career, she has been committed to advancing educational opportunities, nurturing leadership within youth programs, and shaping the next generation of leaders. Dr. Iskandarova's contributions have been recognized with several accolades, including the 2017 Women of Distinction Award from the Office of Access and Inclusion, and the Gold Medal for the

2024 Women Changing the World Americas Awards in the category of Women in Higher Education. She earned her bachelor's degree from Khazar University in Azerbaijan, a master's degree in Adult Education and Human Resource Development from the College of Education, and a doctorate in Postsecondary Analysis & Leadership from the School of Strategic Leadership Studies at James Madison University in Virginia, USA.

Tim Ball (Content Reviewer)

Tim (he/him) is a Professor in the School of Communication Studies at James Madison University where he teaches course in human communication, pedagogy, and organizational communication. His research and scholarship interests include the theory and practice of teaching and how they influence student learning, the assessment of cognitive, behavioral, and affective measures on communication competence, and the ways in which civic engagement is central to effective communication. He has worked with colleagues from other institutions to develop an OER for a human communication course. He holds a BA degree in Journalism from Iowa State University, an MS in Communication from Eastern Washington University, and a Ph.D. from Washington State University.

Bisi Velayudhan (Research Team Member)

Bisi is an Associate Professor of Biology in James Madison University, Harrisonburg, VA. She completed her BS in Veterinary Science and MS in Veterinary Pathology from Kerala Agricultural University in India. Dr. Velayudhan earned another MS in Animal Science from University of Connecticut and a PhD in Mammary biology from Virginia Tech. Dr. Velayudhan is passionate about teaching and interacting with her students. She practices inclusive pedagogies in and outside of classroom. Her current research focuses on understanding the long-term effects of food preservatives on gut health. She is also invested in scholarship of teaching and learning to understand and improve students' learning experiences. Apart from teaching, Dr. Velayudhan is actively

involved in mentoring undergraduate students in research and conduct STEM outreach events for K-12 students.

Katya Koubek (Research Team Member)

Katya earned her Ph.D. in Second Language Acquisition/Foreign Language Education from University of Nebraska-Lincoln. She is a professor and Teaching English to Speakers of Other Languages (TESOL) coordinator in the College of Education at James Madison University. She teachers both graduate and undergraduate courses in TESOL. Currently, she is a Communication Chair for Virginia Teachers of English to Speakers of Other Languages (VATESOL). Her research interests include the use of Artificial Intelligence (AI) by pre- and in-service teachers, teacher attitudes and beliefs, action research in teacher education, high-impact practices, and culturally responsive and sustaining practices.

Jess Marquardt (Research Team Member)

Jess (she/they) is a Lecturer of Biology, James Madison University, Harrisonburg, VA. They teach animal and human physiology, practicing inclusive pedagogies both in and out of the classroom. Jess is passionate about the scholarship of teaching and learning to improve students' sense of belonging and success in the classroom. They are currently a science education doctoral student at the Mallinson Institute for Science Education at Western Michigan University, focusing on inclusive teaching practices and equity in the classroom for all learners. Jess did their doctoral work in animal physiology at the University of Idaho (ABD), earned a M.S. in animal science from Texas A&M University, and a B.S. in animal science from Iowa State University. Along with teaching and studying, they are involved in STEM outreach for K-12 students.

Jaira Ferreira de Vasconcellos (Content Reviewer)

Jaira (she/her) is an Assistant Professor at the Department of Biology, James Madison University. Dr. Ferreira de Vasconcellos is a cellular and molecular biologist passionate about discovering novel biomarkers and targeted treatment strategies. Her main research interests are the molecular mechanisms underlying post-traumatic fibrosis and angiogenesis, impaired wound healing, and ectopic

bone formation in humans. Dr. Ferreira de Vasconcellos is also passionate about teaching and mentoring undergraduate and graduate students in her research laboratory. She holds a Ph.D. in Medical Sciences from the University of Campinas, an M.S. in Genetics from the Federal University of Pernambuco, a Specialization degree in Clinical Analysis from Recife's Frassinetti College, and a B.S. in Biology from the University of Pernambuco.

Dayna Henry (Principal Investigator, MegaSoTL Project)

Dayna (she/her) is the Assistant Director of the Scholarship Area in the Center for Faculty Innovation and an Associate Professor of Health Sciences at James Madison University. Dayna and her team of faculty associates provide programming to support faculty across all stages in the scholarly process, including providing time and space for scholarship, prioritizing scholarship and setting scholarly agendas, and faculty engaged in the scholarship of teaching and learning (SoTL). Her research involves SoTL in the health sciences, supporting faculty in the SoTL process, and understanding sexual and relationship health. She is co-principal investigator of a cross-institutional SoTL project on integrating AI in teaching and learning, which has brought together seven teams of faculty, graduate students, and staff across higher education institutions in Virginia. She holds a PhD in Health Behavior from Indiana University Bloomington and a Masters in Couple and Family Therapy and a Bachelor's in Psychology from University of Guelph in Canada.

Karolina Naranjo-Velasco (Content Reviewer)

Karolina is a Ph.D. candidate in Data Science at the University of Virginia. Her research interests focus on the application of natural language processing (NLP) techniques in legal applications. Her current work involves developing datasets that serve for training models, such as Large Language Models, and improving their capabilities in legal tasks. Beyond her research, she is passionate about learning and providing support for women entering STEM (Science, Technology, Engineering, and Mathematics). She holds a Master of Science in Data Science from the University of Virginia, a Master of Laws with a focus on Constitutional Law from the

University of Seville (Spain), and a Bachelor of Laws from Universidad Industrial de Santander (Colombia).

Creative Commons Licensing

Acknowledgements

Funding Acknowledgement

This project is supported by a Fund for Innovation and Excellence (FFEI) grant from the State Council for Higher Education of Virginia (SCHEV). We extend our gratitude to the University of Virginia Center for Teaching Excellence for their generous funding through the SoTL Collaboration Grant.

Land Acknowledgement

This SoTL project includes higher education partners from throughout the Commonwealth of Virginia. We recognize the many Nations that are traditional custodians of this expanse, including the Cheroenhaka (Nottoway), Chickahominy, Eastern Chickahominy, Mattaponi, Monacan, Nansemond, Nottoway, Pamunkey, Patawomeck, Upper Mattaponi, and Rappahannock, and other currently unrecognized tribes as the original inhabitants of Virginia. We honor their continued connection to the land.

We also recognize and honor the hundreds of thousands of enslaved people from Africa and the Americas who came before us whose labor was stolen to build the wealth of Virginia. These acknowledgements should deepen our awareness of the present effects of systemic racism and white supremacy.

We support the interrogations of these difficult histories so that we may work together for a better future.

-Adapted from the Virtual Library of Virginia land acknowledgement statement.

The MegaSoTL Research and OER Development Process

The MegaSoTL Research and OER Development Process

Our Open Educational Resource (OER) was developed as part of a Virginia cross-institutional Scholarship of Teaching and Learning (SoTL) project on AI in teaching and learning.

Needs Assessment Results

To make our design process transparent and emphasize the collaborative nature of this project, we embedded a needs assessment poster we presented at the Teaching and Learning with AI 2024 conference, which summarized the needs assessment results and our research, design, and development process.

We began with a statewide needs assessment survey: What experience did higher education instructors have with AI, and what did they hope to learn from an OER on teaching and learning with AI in higher education? This needs assessment shaped every aspect of our resource, from its structure and content to delivery format.

Below, we will summarize how faculty feedback influenced our key decisions and led to meaningful improvement. You can learn more about this needs assessment from a poster we presented at the Teaching and Learning with AI 2024 conference. To interact with

this graphic, enter your name/alias and then proceed to click on the interactive elements noted by an “i” encircled in yellow.

https://view.genially.com/66907d799cecf8377f6e989e

Design Decisions

Enhanced Interactivity and Structure of Content

One of the main takeaways from the needs assessment was the demand for engaging, structured, and interactive learning experiences. In response, we designed easy-to-follow chapter structures and developed H5P interactive modules with multimedia learning resources.

Focus on AI Literacy, Pedagogy and Ethics

The needs assessment revealed that AI literacy was the most critical area for educators, followed closely by pedagogy and ethics. Consequently, we adapted a robust AI literacy framework as the foundation of our OER. The framework guides the progression from basic to advanced AI knowledge and skills while embedding ethical considerations at every level. This ensures that educators not only understand AI tools, but also have the skills to teach students how to use them responsibly in diverse classroom environments.

In addition, we included an “Educator’s Kit: Apply and Reflect” section in every chapter featuring practical teaching strategies and reflection questions. We also included chapters on classroom

application, which incorporate practical, specific examples—another key need identified—to help bridge the gap between theory and classroom implementation. These examples include real-world case studies and best practices. The "Course Adaptation in Action" section provides a step-by-step guide for integrating AI into lesson plans and fostering AI literacy among students.

Building a Collaborative Community

Given the strong interest in community features, we added spaces for collaboration and interaction. These include discussion forums, shared resource libraries, and opportunities for readers to submit their own classroom examples. These features are integral to fostering a network of educators committed to learning, sharing, and innovating together.

Adaptability as a Core Principle

Recognizing the importance of adaptability, the OER was designed to allow customization at multiple levels. Educators can reuse and embed the H5P interactive modules into their existing courses and adapt resources to suit various teaching environments. This flexibility ensures that the resource remains relevant and effective across a wide range of educational contexts.

By combining these elements—practical content, a focus on AI literacy, pedagogy and ethics, interactive modules, and community engagement—we created an OER that is not only grounded in educators' current needs but also serves as a dynamic tool for advancing teaching with AI in higher education.

AI LITERACY

Overview of AI Literacy Frameworks

Introduction

With the rapid advancement of generative AI and its growing presence in our daily lives, higher education faculty face a pivotal challenge: preparing students to engage with AI critically, ethically, and responsibly. AI's far-reaching impact on society and the job market underscores the need to equip students not only with technical skills but also with the knowledge to address the ethical and social dimensions of AI.

This OER guide provides faculty with essential knowledge and resources to foster AI literacy, empowering students to become responsible AI users and ethical citizens. By integrating AI literacy into the curriculum, educators can also help bridge digital inequities, ensuring all students have equal opportunities to succeed in an AI-driven world.

In this chapter, you will gain a deeper understanding of AI literacy, explore current research, and analyze various AI literacy frameworks. In the next chapter, you will dive deeper into an AI literacy framework adapted by the authors, which serves as a foundation of the rest of the OER content.

Interactive Module: AI Literacy Overview

An interactive H5P element has been excluded from this version of the text. You can view it online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=111#h5p-1

Reflect and Apply: Educator's Toolkit

Reflection Questions

- How does your current understanding of AI literacy compare to the definitions and frameworks presented?
- Which aspects of the discussed frameworks resonate most with your teaching context?

- Are there competencies or outcomes that seem particularly relevant or irrelevant to your students' needs? Why?
- How do the competencies of "valuing AI" and "displaying digital adaptability" align with your educational goals? What approaches could you take to cultivate a positive and adaptive mindset toward AI in your students?
- What activities or assessments could help students practice meaningful collaboration with AI tools?
- How can your teaching methods address potential disparities in AI literacy among diverse student populations?
- In what ways can you model lifelong learning and adaptability as an educator ?

Use the Padlet Discussion Board to share your thoughts with peer educators.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=111

Made with :Padlet

Additional Resources

- Artificial Intelligence Now: ChatGPT + AI Literacy Toolbox: AI Literacy

  A comprehensive resource on artificial intelligence, ChatGPT, writing with AI assistance, AI academic productivity tools, plagiarism, prompt engineering, GPT misinformation and hallucinations, AI image tools, AI literacy, and discussions related to AI ethics developed by Melissa S. Del Castillo, FIU Libraries.
- AI Literacy Resource Hackathon This project by Carnegie Mellon University includes a variety of open educational resources related to AI literacy.

The Progressive AI Literacy Framework

Introduction

While the last chapter examined current research and compared various AI literacy frameworks, this chapter introduces a new AI literacy framework we developed called the Progressive AI Literacy Framework, which adapts and enhances these AI literacy models to better meet the evolving needs of educators and students in the era of generative AI.

The Progressive AI Literacy Framework synthesizes insights from the Barnard AI framework and other prominent models, refining them to provide a more comprehensive and practical approach. It emphasizes embedding ethics across all levels of learning, streamlines competencies for clarity, balances progression and flexibility, and uniquely addresses the critical role of educators in fostering AI literacy. This framework not only prepares students to navigate the AI-driven world critically and ethically but also equips educators with the knowledge and skills necessary to guide their students effectively. In addition, the remaining resources in this guide are designed to support both students and educators in mastering the competencies outlined in this framework.

In this chapter, you will explore the development and structure of the Progressive AI Literacy Framework, understand its unique contributions, and reflect on how it can be adapted to your teaching context.

Interactive Module: AI Literacy Overview

An interactive H5P element has been excluded from this version of the text. You can view it online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=112#h5p-2

Reflect and Apply: Educator's Toolkit

Reflection Questions

- In what ways can the Progressive AI Literacy Framework address the challenges of teaching AI literacy in higher education?
- How might you apply the Progressive AI Literacy Framework in your own teaching context? For

example, what competencies outlined are most essential to you?

- Where does the Progressive AI Literacy Framework fall short? What competencies might be missing, or not essential?
- What are the key differences between this framework and others, such as the Barnard or Educause models?
- Is this AI literacy framework practical, clear, and easy to use?
- Does the inclusion of educator competencies in this framework enhance its practical application?

Use the Padlet Discussion Board to share your thoughts with peer educators.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=112

Made with :Padlet

Share Your Feedback

We'd love to hear your feedback on this adapted framework. Please share your thoughts with us using the following form:

One or more interactive elements has been excluded from this version of the text. You can view them online here:
https://pressbooks.library.virginia.edu/ai-literacy/?p=112

Provide Feedback

Feedback plays a critical role in refining and enhancing our resource to better serve the needs of our users. We have already implemented several significant changes and updates based on insights from our initial needs assessment to ensure the guide aligns with identified priorities. As part of our commitment to continuous improvement, we are actively collecting feedback through ongoing research studies. However, we also want to expand our feedback efforts to include a broader audience. By hearing from a diverse range of users, we can better understand how useful this resource is and identify areas for further enhancement, ensuring the OER guide remains a valuable and relevant resourcel for all.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=113

LEVEL 1: KNOW AND UNDERSTAND AI

Alignment with AI Literacy Framework: This part aligns primarily with the “Understand AI” level of the AI literacy framework. It provides educators with the foundational knowledge needed to comprehend AI concepts, capabilities, and limitations. By understanding these fundamentals, educators can better guide students in developing their own understanding of AI and prepare educators to address student questions about anticipating AI’s current and future role in their discipline.

Understanding AI Key Concepts

AI Literacy Framework Level 1 Understand AI: Understand Key AI Concepts

Core Competencies covered in this chapter:

- Define the terms “artificial intelligence,” “machine learning,” “large language model,” and “neural network.”
- Identify and explain the differences between various types of AI, as defined by their capabilities and computational mechanisms

Introduction

This chapter will introduce you to the core concepts of artificial intelligence (AI), common AI-related terms, and the historical development of AI. A strong understanding of these fundamentals is crucial for educators aiming to explore AI ethics and incorporate AI tools responsibly in your teaching.

To get started, IBM has produced a series of short, easy-to-understand videos on AI fundamentals. If you are unfamiliar with terms like "deep learning"","large language models" (LLMs), "foundational models," it will be helpful to review these videos and additional resources in the interactive module to build your knowledge base.

Interactive Module: Understanding AI Key Concepts

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://pressbooks.library.virginia.edu/ai-literacy/?p=117#h5p-3

Reflect and Apply: Educator's Toolkit

Core Competencies for Educators:

Educators should have a solid understanding of fundamental AI concepts, such as "artificial intelligence," "machine learning," "large language model," and "neural network.". This includes the ability to select proper resources based on students' existing level of understanding of AI and their expected level of understanding and break down these concepts in a way that is accessible and engaging for students, using real-world examples and analogies.

Reflection Questions

- What foundational AI concepts are essential for students in your course?

- Why is it important for students to develop a fundamental understanding of these AI concepts?
- What instructional resources you find most effective for teaching these AI concepts?
- How do you assess and identify students' current understanding to assign appropriate resources?

Use the Padlet Discussion Board to share your thoughts with peer educators.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=117

Made with :Padlet

Made with :Padlet

Tips and Best Practices

Below you will find an h5p training module that includes much of the information in the textbook Part, Writing and Artificial Intelligence. The module includes assessments and can be easily incorporated into an LMS such as Blackboard, Canvas, or Moodle. If you have suggestions for how to improve the module, please each out to one of the editors.

https://ctl.h5p.com/content/1292096832082357938

History of AI Development and Future Trends

AI Literacy Framework Level 1
Understand AI: History of AI Development and Future Trends

Core Competencies covered in this chapter:

- Articulate how AI might evolve and how these trends could influence various sectors.
- Imagine possible future applications of AI and consider the effects of such applications on the world.

Introduction

As you deepen your understanding of key AI concepts in the previous chapter, it's also essential to explore the historical development and future trends of AI technology. This foundational knowledge will provide context for AI's current strengths and limitations, which will be discussed in the next chapter. By examining how AI has evolved and where it's heading, educators can better anticipate how these technologies will impact teaching, learning, and society at large.

Interactive Module: History of AI Development and Future Trends

An interactive H5P element has been excluded from this version of the text. You can view it online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=118#h5p-4

Reflect and Apply: Educator's Toolkit

Core Competencies for Educators:

- Keep up with the latest trends in AI, such as advancements in generative AI and their own disciplines. This enables you to facilitate discussions about how AI might evolve and how these trends could influence various sectors.
- Foster students' critical thinking by exploring potential future scenarios and implications of these trends.

Reflection Questions

- Looking at the nine AI trends for 2024, particularly the shift towards integrated AI tools like Microsoft Copilot:
    - How can you prepare students for a world

where AI is embedded in everyday tools?

- Regarding the trend for human-in-the-loop augmentation, how can you design learning experiences that empower students to effectively collaborate with AI systems
- What foundational skills in your discipline should you prioritize teaching that will remain relevant regardless of AI advancement?
- With the rapid development of AI, what are your strategies for keeping up with the changes and staying informed?

Use the Padlet Discussion Board to share your thoughts with peer educators.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=118

Tips and Best Practices

Strategies and Best Practices for Staying Updated with AI Trends in Education

- **Join Online or In-Person Forums and Communities and Collaborate with Peers**
    - AI in Education Google Group – This AI in Education Google Group now has over 350 members from 70+ schools in 8 countries.
    - Join faculty learning communities or other programmings at your own institutions
    - Share knowledge and best practices with fellow educators who are also exploring AI at your institutions
- **Follow Thought Leaders and Reliable Sources**
    - Subscribe to newsletters, blogs, or YouTube channels from experts in AI and education
        - Blogs
            - One useful thing by Ethan Mollick
            - Cyborgs Writing by Lance Cummings
            - AI + Education = Simplified by Lance Eaton
            - Reflecting Allowed by Maha Bali
        - Youtube channels
            - IBM Technology
        - Institutions

        - EdSurge, Educause, Chronicle

- **Attend Classess, Conferences and Workshops Online or at Your Institutions**
    - Conferences
        - Teaching and Learning with AI by University of Central Florida
    - Courses and Workshops
        - Teaching with AI Canvas Course by Auburn University
        - Teaching with AI Online Program by Educause
        - Artificial Inteligence in Higher Education by OneHE

- **Experiment with AI Tools**
    - Integrate AI tools into your teaching practices, such as AI-driven grading tools, chatbots for student support, or adaptive learning platforms.
    - Embrace a growth mindset and reflect on your experiences and adapt your strategies based on student feedback and outcomes.

- **Stay Curious and Open-Minded**
    - Regularly ask, “How can this technology enhance teaching and learning?”
    - Stay open minded while exploring how

AI can address diverse educational challenges.

- **Collaborate with Instructional Designers and Educational Technologists**
    - Work with instructional and technology consultants at your institutions to understand the technical and pedagogical aspects of AI tools.

AI Ethics: Strengths, Limitations and Ethical Considerations of AI Tools

AI Literacy Framework Level 1 Understand AI:
AI Ethics: Strengths, Limitations and Ethical Considerations

Core Competency covered in this chapter:

- Recognize the strengths and limitations of AI tools.
- Identify problem types that AI excels at and problems that are more challenging for AI. Use this information to determine when it is appropriate to use AI and when to leverage human skills.
- Identify and describe different perspectives on the key ethical issues surrounding AI (i.e. privacy, hallucination, misinformation diversity, bias).

Introduction

While the innovation and creativity of generative AI is exciting, these systems do not come without limitations or ethical challenges. Having a good understanding of AI's capabilities can help both educators and students leverage its potential while being aware of its limitations. Beyond understanding the strengths and limitations, it's also vital for students to learn about ethical considerations, such as bias, hallucination, environmental cost, and privacy concerns. This knowledge will empower students to navigate the evolving landscape of AI, leverage its potential, and mitigate its risks, ultimately contributing to a future where AI is used responsibly and ethically for the benefit of all.

This chapter will introduce you to some broader strengths and limitations of AI and will then turn to a deep dive into the specific ethical concerns.

Interactive Module: Strengths and Limitations of AI Tools

An interactive H5P element has been excluded from this version of the text. You can view it online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=119#h5p-5

Interactive Module: Ethical Considerations AI Tools

An interactive H5P element has been excluded from this version of the text. You can view it online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=119#h5p-6

Reflect and Apply: Educator's Toolkit

Core Competencies for Educators

- Understand the general capabilities and limitations of AI tools, as well as their potential applications and ethical considerations.
- Guide students in thinking critically about both the benefits and drawbacks of using AI technologies.

Reflection Questions

- AI Bias: How can you incorporate discussions about AI bias into your teaching to help students critically evaluate and challenge systemic inequalities reflected in AI outputs?
- AI Hallucinations: How can you teach students to identify and critically assess AI-generated outputs to ensure they rely on verified and accurate information?
- Environmental Costs: What steps can you take to raise awareness among students about the environmental impact of AI, and how can this be integrated into course content and activities?
- Misinformation: How can you equip students with the skills to detect and counteract misinformation propagated by AI tools in academic and professional settings?
- Privacy Concerns: What policies or guidelines can you establish in your classroom to safeguard student data when engaging with AI tools?
- Deepfakes and Disinformation: What pedagogical approaches can you employ to help students critically evaluate media and understand the implications of deepfakes?
- Ethical Use of AI: What strategies can you use to ensure students understand the ethical implications of using AI tools, particularly in research and academic work?
- Interdisciplinary Collaboration: How can

collaboration between diverse academic disciplines enhance the understanding and mitigation of AI's ethical challenges?

Use the Padlet Discussion Board to share your thoughts with peer educators.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=119

Made with :Padlet

Tips and Best Practices

General Best Practices

It's essential to cultivate a healthy skepticism among students—and in our own practice—regarding the reliability of responses generated by AI. This includes consistently verifying AI outputs against credible sources. Moreover, fostering balanced and diverse perspectives on AI ethics is beneficial. For instance, while AI-generated

hallucinations can sometimes lead to misinformation, they also offer opportunities for creative exploration and innovation. By understanding both the potential risks and benefits, students can better leverage AI's creative capabilities in constructive and ethical ways.

When teaching AI ethics, the vast number of potential ethical issues can feel overwhelming. **While it's important to establish a baseline understanding using resources like OERs, a deeper engagement can be achieved by focusing on one or two ethical concerns that are particularly relevant to the course or the students' disciplines.** For instance, environmental science courses could emphasize the environmental costs of AI, while communications courses might focus on issues like deepfakes and misinformation. Alternatively, allowing students to choose an ethical issue that resonates personally with them can enhance their engagement and motivation to explore the topic further. This tailored approach ensures the learning experience is both meaningful and impactful.

Creating safe discussion spaces is fundamental to teaching AI ethics effectively in the classroom. Instructors need to cultivate an environment where students feel genuinely comfortable sharing their diverse perspectives on complex ethical issues, even when those views might challenge conventional wisdom.When students feel secure enough to contribute their personal experiences and observations, it enriches the learning experience for everyone and helps bridge the gap between theoretical concepts and real-world implications.

Staying current with AI developments represents a crucial responsibility for educators in this rapidly evolving field. This commitment to continuous learning

involves carefully monitoring emerging ethical concerns as they arise in the AI landscape and promptly updating course materials to reflect new AI developments. By incorporating recnet case studies and examples, instructors can keep the material relevant and engaging. Furthermore, adapting teaching methods based on student feedback ensures the course remains responsive to learners' needs and effectively addresses their most pressing questions about AI ethics.

Specific Strategies for Teaching Bias

As educators, we must carefully consider how biases in generative AI might be perpetuated or overlooked when incorporating these tools into teaching materials or assessments. This is another reason why we need to be careful about using AI detectors for plagiarism, as research showed that AI detectors have been found to be more likely to label text written by non-native English speakers as AI-written.

We also need to engage students in learning about the inherent biases in generative AI, turning this into an opportunity for collective exploration. We should encourage students to identify and discuss the biases they observe in AI-generated outputs, reflecting on the potential causes and implications of these biases.

- Helping students understand the biases in generative AI – This article by Edutopia shared a framework from Demarginalizing Design that can be remembered by the mnemonic device, "Am I Right?" to help students examine their

own biases and AI biases.

        - Avoiding objective facts.
        - Misinterpreting information in a way that only supports existing beliefs.
        - Ignoring information that challenges existing beliefs.
        - Remembering details that only uphold existing beliefs.

    - Helping students understand the biases in generative AI – This resource developed by Center for Teaching Excellence at the University of Kansas shared a number of interesting classroom activities at the end of the article for educators can explore.

Specific Strategies for Teaching Environmental Concerns

Educators have a responsibility to inform students about the environmental impact of AI tools. We have an opportunity to make a difference by contributing to carbon offsetting programs and to educating our students on the environmental cost of these tools.

By training students in efficient prompt engineering and helping them understand when to use AI vs. traditional tools, educators can help to reduce the energy consumption associated with these AI tools.

- AI's Impact on the Environment – This classroom guide developed by AI for Education provided a

number of discussion and reflection questions for engaging your students in exploring the potential impact of Generative AI (GenAI) on the planet.

Classroom Examples and Pedagogical Strategies

Introduction

Incorporating AI literacy into higher education can feel like a daunting and time-intensive endeavor. This chapter highlights real-world examples of how educators are effectively teaching the competencies covered in this chapter in their classrooms. By showcasing diverse approaches, we aim to inspire and empower faculty to integrate AI literacy into their teaching practices, regardless of discipline or expertise.

Aligned with the philosophy of open educational resources (OER), we encourage the adaptation of existing approaches and resources to save time and effort while addressing the unique needs of individual educators and their students. By building on proven strategies, faculty can seamlessly incorporate AI literacy into their teaching without reinventing the wheel.

In addition to these examples, we provide effective pedagogical strategies that can be adapted to various educational contexts, along with curated resources for further exploration.

We also encourage you to contribute to this growing body of knowledge. If you have a classroom example to share, please submit it via the form below or contact us at **teachingwithaioer@virginia.edu**. Your insights and experiences can help shape the future of AI education in higher ed.

Classroom Example :Teaching Fundamental AI Concepts in First-Year Writing Programs

Example Overview: To introduce students to the fundamental concepts of AI in the context of writing, instructors can incorporate an H5P Module: Writing and Artificial Intelligence into their first-year writing courses. This interactive module, developed by Amy Minervini, Liza Long, and Joel Gladd, is designed to provide foundational knowledge about the role of AI in writing while engaging students with hands-on assessments.

Recommended Use: It can be seamlessly integrated into learning management systems such as Blackboard, Canvas, or Moodle.By using this module, first-year writing instructors can help students develop critical thinking skills about AI's role in writing and its ethical implications, preparing them to navigate AI technologies responsibly in academic and professional contexts. For further customization or improvement suggestions, educators are encouraged to connect with the module's editors.

Explore the Example: H5P Module: Writing and Artificial Intelligence.

Classroom Example: Socratic Teaching

Example Overview: Harvard Professor Michael Sandel's approach

to fostering AI literacy, particularly in AI ethics, emphasizes the power of public discourse and debate to engage students deeply in complex issues. Drawing from his renowned Socratic teaching style, Prof. Sandel encourages students to grapple with ethical dilemmas posed by artificial intelligence by questioning underlying assumptions and considering diverse perspectives. Through structured yet open-ended discussions, students explore the societal impacts of AI technologies, such as biases in algorithms, implications for privacy, and the moral dimensions of decision-making by AI systems. Prof. Sandel's method cultivates critical thinking, civic responsibility, and ethical reasoning and is a good model for other educators in Higher Ed to explore.

Recommended Use: Below are some examples of Prof Sandel's classrooms and teaching methods for you to explore and learn more.

Recent studies have also shown that Socratic AI chatbots can enhance students' learning, develop their critical thinking, as well as minimize plagiarism. We curated a list of papers and examples for you to explore below.

- The Public Philosopher Podcast by Michale Sandel
- Ethics in the Age of AI | Davos 2024 | World Economic Forum
- Michael Sandel: The lost art of democratic debate

Socratic AI Chatbots

- Crafting a Semi-Socratic Tutor with ChatGPT
- Socratic AI Against Disinformation: Improving Critical Thinking to Recognize Disinformation Using Socratic AI
- ChatGPT as a tool for honing teachers' Socratic dialogue skills
- AI Oral Assessment Tool Uses Socratic Method to Test Students' Knowledge
- There are also a couple of existing Socratic AI ChatGPT bots available in the Open AI ChatGPT library that you can test out.

Project Example: The AI Pedagogy Project

"We are at an inflection point in the development of AI tools — who will decide what capabilities are developed, by whom, and to what end?

We believe it is crucial for all educators, including those in non-technical fields, to contribute to these conversations— to surface questions about what it means to be human, to bring critical and historical perspectives to AI, and to revisit the goals of education, now, and in the future."

–AI Pedagogy Project

Example Overview: The AI Pedagogy Project was created by the metaLAB (at) Harvard within the Berkman Klein Center for Internet & Society. The AI Pedagogy Project helps educators engage their students in conversations about the capabilities and limitations of AI informed by hands-on experimentation.

Recommended Use:

AI Guide – Focused on the essentials and written to be accessible to a newcomer, this interactive guide will give you the background you need to feel more confident with engaging in conversations about AI in your classroom. This guide is concise and provides interactive and hands-on tutorials on LLMs. Additionally, it has a resource section for further reading and exploration.

AI assignments – This project features a continuously growing collection of AI assignments created by educators. These assignments can be customized to your own pedagogical values and classroom needs. These assignments cover a wide range of disciplines and AI topics, such as AI ethics and AI literacy. Use the filters to search for assignments relevant to your own needs.

Reflect and Apply: Educator's Toolkit

Pedagogical Strategies and Considerations

The process of teaching artificial intelligence fundamental concepts benefits significantly from multi-modal, experiential learning approaches. Drawing on research by Long & Magerko (2020) ,educators can leverage visual, interactive, and hands-on methods to make abstract AI concepts more concrete and accessible. When students engage with graphical visualizations and participate in interactive demonstrations, they develop a more intuitive understanding of complex AI systems and algorithms. This understanding becomes even more profound when students physically experiment with AI technology through embodied simulations, allowing them to observe and interact with algorithmic processes in real-time. Additionally, the effectiveness of learning AI fundamentals increases substantially when educators connect these learning experiences to students' lived experiences and current interests.

For example, Teachable Machine serves as a powerful educational tool by enabling students to train machine learning models using their own images, sounds, and movements. This direct interaction with machine learning

demystifies the technology by showing how AI systems learn from data in a tangible, observable way. Students witness firsthand how their inputs influence the model's learning process, making abstract concepts like training data and pattern recognition immediately relevant and comprehensible.

This approach to fostering AI literacy embraces a significant pedagogical shift: moving from traditional instructor-centered (Sage on the Stage) teaching to a facilitator role to create a more collaborative learning environment. Educators do not need expert-level AI knowledge to facilitate meaningful learning experiences. Instead, by utilizing open educational resources and adopting the role of co-learner and facilitator, teachers can create an inclusive space where everyone participates in discovering and understanding AI concepts together.

Reflection Questions

- How does your current teaching approach align with the multi-modal, experiential learning methods recommended for AI literacy? What specific changes might help bridge any gaps you identify?
- When you consider the shift from 'Sage on the Stage' to the facilitator described in the document, what excites and what concerns you about this transition? How might these feelings influence your teaching effectiveness?
- In what ways could you connect AI concepts to your

students' lived experiences and current interests within your specific discipline? Consider both obvious and non-obvious connections that might emerge.

- How might the H5P Module approach described for first-year writing programs be adapted for your specific field? What unique opportunities and challenges would this present?"
- Reflecting on the Socratic teaching style exemplified by Prof. Sandel, how could you incorporate similar dialogue-based approaches to explore ethical dimensions of AI in your course content?"
- How could you create a collaborative learning environment where both you and your students can explore AI concepts together, especially if you're not an AI expert yourself?"
- "How might you balance the need to teach fundamental AI concepts with maintaining focus on your course's primary learning objectives? What integration strategies could serve both goals?

Use the Padlet Discussion Board to share your thoughts with peer educators.

https://padlet.com/embed/jd9z2m4vav4u6moo

Made with :Padlet

Contribute: Add a Resource

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=121

Provide Feedback

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=123

LEVEL 2: USE AND APPLY AI

Alignment with AI Literacy Framework: This part of the OER aligns primarily with the "Use and Apply AI" component of the AI Literacy Framework. It equips educators with essential knowledge and practical skills for selecting and using AI in their discipline, as well as key prompting techniques they can model and teach to students. Additionally, it prepares educators to navigate challenges related to academic integrity and implement pedagogical strategies that promote ethical and responsible AI use in academic settings.

AI Tool Evaluation and Selection

AI Literacy Framework Level 2 Use and Apply AI: AI Tool Evaluation and Selection

Core Competencies covered in this chapter:

- Demonstrate familiarity with the core features and capabilities of various Gen AI tools.
- Evaluate and select appropriate Gen AI tools to effectively address specific tasks or purposes.

Introduction

The rapid proliferation of AI tools presents higher education faculty with an overwhelming array of options, making it difficult to identify which technologies genuinely enhance teaching and learning versus those that distracts from our goals. This chapter provides an overview of the types of AI tools and a systematic framework for evaluating and selecting AI tools based on your specific educational challenges rather than adopting impressive-seeming technologies that may not address real pedagogical needs. You'll learn a structured approach that helps you make informed decisions about whether, when, and how to integrate AI into your courses effectively.

Interactive Module: AI Tool Evaluation and Selection

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://pressbooks.library.virginia.edu/ai-literacy/?p=126#h5p-10

Reflect and Apply: Educator's Toolkit

Core Competencies for Educators

Educators should be familiar with popular Gen AI tools such as Copilot and Chat GPT as well as specialized tools within their discipline that may include media production, language, and research tools. They should also be able to articulate the differences in the tools' capabilities and outline best-use scenarios for achieving their course learning objectives. Educators should also select appropriate AI tools for teaching and student learning.

Reflection Questions

- Reflecting on the various categories of AI tools (standalone, integrated, custom), how has your understanding of the AI landscape evolved? Which type of tool do you now see as most relevant for your immediate teaching context, and why?

- How did following the systematic AI tool selection process compare to any previous, more ad hoc methods you might have used for technology adoption? What specific advantages or insights did this structured approach provide?
- The selection process emphasizes starting with pedagogical needs before technology. How did beginning by defining your specific educational challenge influence your entire selection process, and did it prevent any potential pitfalls you might have otherwise encountered? what new teaching or learning challenges might you consider addressing with AI tools
- Which of the evaluation criteria – such as data privacy, accessibility, integration capabilities, error tolerance, or scalability – did you find most critical or challenging to assess for your specific needs, and what did you learn from this assessment?
- Institutional support often makes the difference between success and abandonment. How did investigating and considering your institution's AI resources and support systems impact your choices, and what steps might you take to leverage these resources more effectively in the future?
- The selection process highlights the unpredictable nature of generative AI tools and the importance of hands-on testing with realistic scenarios. What unexpected capabilities or limitations did you discover during your testing phase that you couldn't have predicted from initial evaluations or reviews?
- During the pilot phase, the selection process suggests being prepared to adjust teaching practices.

What specific modifications to your assignments, guidance, or assessment methods did you identify as necessary for successful AI integration, and what does this imply about the role of technology in pedagogical change?

- Reflect on the argument that "deciding not to adopt an AI tool after systematic evaluation is often the right choice". How does this perspective resonate with your experience, and how might it inform your future approach to evaluating new educational technologies?

Use the Padlet Discussion Board to share your thoughts with peer educators.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=126

Made with :Padlet

Tips and Best Practices

As AI tools continue evolving at a rapid pace, educators need reliable resources for both tracking new developments and conducting thorough evaluations. The following resources coule be helpful for keeping up with latest development and the evaluation process.

- AI for Education Pedagogy Model Benchmark : When evaluating AI tools for educational use, you often need to assess the underlying AI models' capabilities. However, standard commercial AI benchmarks focus on general performance rather than education-specific competencies. The Pedagogy Benchmark addresses this gap by testing whether AI models can pass actual teacher certification exams and demonstrate pedagogical knowledge. This education-focused testing helps educators make informed decisions about which models are suitable for tutoring applications and other instructional purposes.

- What AI Can Do Today :This resource serves as your guide to understanding current AI capabilities. You can use it to search for AI tools that offer specific functionalities aligned with your teaching needs.

- ITHAKA S+R Generative AI Product Tracker : This maintained database functions as your comprehensive catalog for discovering and comparing available tools in the educational market. The tracker specifically focuses on generative AI products that are either designed for higher education or actively used by faculty and students for teaching, learning, and research activities. As a living

document that receives regular updates, it proves particularly valuable for staying current with the rapidly changing landscape of educational AI tools.

Prompting Techniques

AI Literacy Framework Level 2 Use and Apply AI: Prompting Techniques

- Core competencies covered in this chapter:
  - Experiment with prompting techniques.
  - Iterate on prompt language to improve AI-generated output.

Introduction

One important competency of AI literacy is the ability to effectively communicate and partner with AI tools. While many people view prompt engineering as a daunting new technical skill, it's actually

an extension of our natural communication abilities. Just as we instinctively adjust our communication style when explaining concepts to different audiences – whether they're first-year students, graduate researchers, or colleagues – crafting effective prompts for AI draws on these same adaptive communication skills. This module demystifies prompt design by connecting it to familiar teaching and learning practices, making it more accessible and practical. By understanding and teaching these prompting frameworks and techniques, we can empower students to become more effective users of gen AI tools, helping them achieve their desired results while building crucial skills for the AI-enhanced future of education and the workforce.

Interactive Module: Prompting Techniques

An interactive H5P element has been excluded from this version of the text. You can view it online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=128#h5p-11

Reflect and Apply: Educator's

Toolkit

Core Competencies for Educators

Educators should understand various prompting techniques and demonstrate how to use them to refine AI-generated outputs. They should also encourage students to experiment with prompt phrasing, structure, and iteration while providing feedback on how these adjustments affect the quality and relevance of AI responses.

Reflection Questions

- Students often struggle to articulate their thoughts clearly when writing prompts for AI. How would you design learning activities that help students break down their thinking process and communicate their intentions more effectively? What specific challenges do you anticipate, and how would you address them?
- Consider the different frameworks presented (SCRIPT, Rhetorical Triangle, SCALE). If you were introducing these to your students, which would you start with and why? How would you help students

understand when to use each framework based on their specific needs?

- When teaching writing, we often use peer review and revision processes. How might you adapt these familiar pedagogical approaches to help students improve their prompting skills? What would meaningful peer feedback on AI prompts look like in your classroom?
- Students bring varying levels of experience with AI tools to the classroom. How would you create an inclusive learning environment that supports both novice and experienced AI users in developing their prompting skills? What differentiation strategies might be effective?
- Think about the connection between critical thinking and effective prompt design. How would you help students understand that crafting good prompts requires analyzing their own thought process? What metacognitive strategies could support this understanding?
- Consider a major assignment in your course. How could you integrate prompt design instruction in a way that both supports students' learning of the course content and develops their AI literacy? What specific prompting skills would be most valuable for your students?Use the Padlet Discussion Board to share your thoughts with peer educators.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=128

Made with :Padlet

Tips and Best Practices

- Activity: Repurposing Your Bio

  This is an activity developed by Lance Cummings for practicing content repurposing using the rhetorical triangles prompting techqniue. Below is detailed instruction:

  "For this activity, I invite you to locate a bio you've previously written about yourself. Analyze the target audience of this course (or some other community) and use the principles of rhetoric to repurpose your bio accordingly using ChatGPT.

It really doesn't matter how long the bio is. If you don't have any, I recommend just writing a generic one that you might post on a social media home page.
"

AI Ethics: Academic Integrity and Citation

AI Literacy Framework Level 2 Use and Apply AI: AI Ethics: Academic Integrity and Citation

Core Competencies covered in this chapter:

- Vigilance in use of AI tools and articulation of ethical use of AI in academic to uphold academic integrity.
- Transparency about AI usage in all academic work, including statements about and citation of AI-influenced work.

Introduction

Consider a scenario: A student submits a well-written essay that thoughtfully analyzes complex concepts. The ideas are sound, the arguments coherent, but you suspect AI involvement. Is this academic dishonesty? What if the student used AI as a brainstorming tool or for editing? These questions highlight the complexity of maintaining academic integrity in an era where the line between human and machine-generated content becomes increasingly blurred.

In this chapter, we will provide you with insights and research into how AI reshapes academic integrity, the challenges it presents, and strategies to uphold ethical academic work in higher education.

Interactive Module: AI Ethics: Academic Integrity and Citation

An interactive H5P element has been excluded from this version of the text. You can view it online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=129#h5p-12

Reflect and Apply: Educator's Toolkit

Core Competencies for Educators

Educators should teach students how to use AI tools ethically in academic work, including proper citation of AI-generated content and maintaining academic integrity. They should also understand, decide and explain institutional and course-level policies on AI use in class.

Reflection Questions

- How do the six fundamental values of academic integrity (honesty, trust, fairness, respect, responsibility, and courage) need to be reconsidered or reinterpreted in an era where AI tools can generate human-like content? Which value do you find most challenging to uphold in this context?
- Current research presents AI detection tools as unreliable for high-stakes academic decisions. What

are the potential equity concerns when using these tools, and how might their use affect your relationship with students?

- Consider your own teaching practices: In what ways might your current assessment strategies unintentionally encourage students to use AI inappropriately? What specific changes could you make to design assignments that remain meaningful in an AI-augmented educational landscape?
- The concept of "post-plagiarism" suggests we need new frameworks for understanding academic integrity. How comfortable are you with the idea that "hybrid human-AI writing will become normal"? What boundaries would you establish between acceptable and unacceptable AI use in your discipline?
- What specific guidelines would you create for your students regarding AI citation and attribution? How would these guidelines balance transparency with practical considerations about the workload of documentation?
- AI misuse in academia is often a symptom of larger systemic pressures. Reflecting on your institutional context, what systemic issues might be driving students toward inappropriate AI use, and what role can you play in addressing these root causes?
- How might you use the framework of mastery-based learning (rather than performance-based assessment) to reduce the incentives for academic misconduct in your courses? What specific practices would you implement?
- Consider the "Artificial Intelligence Disclosure (AID) Framework" described in the module. How might

implementing such a framework in your courses change your approach to assessment? What benefits and challenges do you foresee in requiring this kind of disclosure?Use the Padlet Discussion Board to share your thoughts with peer educators.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=129

Made with :Padlet

Tips and Best Practices

Streamlined Documentation Approaches

Students arrive at college without prior training in AI citation and acknowledgement, as this is not yet part of

K-12 education. Just as we teach traditional citation methods, we need to explicitly teach AI citation as a new academic literacy skill. However, citation methods must balance thoroughness with practicality.

1. **Establish clear, reasonable documentation expectations:** Provide templates and examples that demonstrate the necessary level of detail without requiring excessive documentation.
2. **Implement chat consolidation techniques:** Teach students to organize their AI interactions within single conversation threads rather than multiple sessions. This makes sharing and citing much easier, as they can provide one comprehensive link rather than dozens of fragmented interactions.
3. **Use shared links for major platforms:** For tools like ChatGPT that offer shareable links, show students how to generate and include these links in their documentation. This provides complete transparency without tedious manual copying.
4. **Create simplified templates for AI disclosure statements:** Develop standardized forms, which asks students to document:
    - Which AI tools they used
    - How they used them (ideation, research, drafting, editing)
    - Sample prompts they employed
    - How they incorporated the AI-generated content
5. **Integrate process documentation into assignments:** Build documentation into the workflow rather than treating it as an add-on task. For example,

require an annotated first draft showing AI contributions alongside the final submission.

Implementation Strategies

1. Demonstrate the documentation process in class, showing how you interact with AI and then document it.
2. Provide exemplars of well-documented AI use to give students clear models to follow.
3. Consider using a simplified version of the Artificial Intelligence Disclosure (AID) Framework appropriate to your course level.
4. Create a course-specific AI policy that clearly articulates what constitutes appropriate AI use and documentation in your particular context.
5. Emphasize transparency over perfectionism—make clear that honest disclosure, even if imperfect, is valued more than attempting to hide AI use.
6. Gradually introduce more sophisticated documentation requirements as students develop proficiency, starting with basic disclosure and moving toward more comprehensive attribution practices.

Classroom Application, Case Studies, and Additional Resources

Introduction

Incorporating AI literacy into higher education can feel like a daunting and time-intensive endeavor. This chapter highlights real-world examples of how educators are effectively teaching the competencies covered in this chapter in their classrooms. By showcasing diverse approaches, we aim to inspire and empower faculty to integrate AI literacy into their teaching practices, regardless of discipline or expertise.

Aligned with the philosophy of open educational resources (OER), we encourage the adaptation of existing approaches and resources to save time and effort while addressing the unique needs of individual educators and their students. By building on proven strategies, faculty can seamlessly incorporate AI literacy into their teaching without reinventing the wheel.

In addition to these examples, we provide effective pedagogical strategies that can be adapted to various educational contexts, along with curated resources for further exploration.

We also encourage you to contribute to this growing body of knowledge. If you have a classroom example to share, please submit it via the form below or contact us at **teachingwithaioer@virginia.edu**. Your insights and experiences can help shape the future of AI education in higher ed.

AI-Enhanced Instructional Design

Example Overview: This open resource guide presents practical examples of AI applications that are versatile and suitable for a broad spectrum of instructional activities alongside others that have more specific uses. The textbook explores effective ways AI can generate high-quality course content, foster creativity, personalize learning, and drive innovation.

Recommended Use: This open resource, licensed under the Creative Commons Attribution NonCommercial ShareAlike, allows educators to remix and adapt it as needed. This resource includes a range of AI tools with step-by-step guides on how to use them for different instructional design tasks. It examines the affordances and limitations of each AI tool, helping educators make informed decisions about their use. The examples are geared towards K-12 context, but Higher Ed educators can still integrate this guide into their teaching strategies or adapt its examples to fit their instructional goals.

Explore the Example: AI-Enhanced Instructional Design

AI Tool Evaluation Sprint

Example Overview: The AI Tool Evaluation Sprint is a classroom activity designed to help students evaluate and select appropriate

AI tools for different tasks relevant to their learning in a given class (e.g., summarizing content, literature reviewing, generating code, etc.). Students work in small groups to discuss tools that can best address specific tasks, considering criteria like functionality, usability, reliability, and ethical considerations. Through group discussions, students identify strengths and limitations of AI tools, select what they believe to be optimal choices for each task, and present their reasoning to their classmates and instructor. This fast-paced activity challenges students to think critically and collaboratively while making practical decisions about AI integration into educational settings.

Recommended Use: This activity is highly adaptable to a variety of course contexts and sizes. Select the use cases most relevant to your classroom—for example, for a research methods course in psychology, you might choose tasks such as identifying relevant literature, generating hypotheses and study designs, generating R code for common data analysis procedures, and generating figures and images for a research poster. Use this activity to help students see how generative AI can augment their learning, rather than replace it, and help them make better choices about effective tools. By encouraging students to actively engage with emerging technologies in a context that mirrors real-world decision-making, you are setting them up with skills that will serve them well in their futures.

Explore the Example: AI Tool Evaluation Sprint

How to Prompt AI Chatbots

Example Overview: The How to Prompt AI Chatbots open resource is a beginner-friendly guide that introduces students to the fundamentals of text-to-text prompting. It includes various examples to help them understand effective AI interactions.

Recommended Use: This open resource, licensed under the Creative Commons Attribution 4.0 International License, allows educators to remix and adapt it as needed. You can assign it as an introductory guide or draw inspiration from its prompting examples to help students learn how to use AI effectively for various tasks.

Explore the Example: How to Prompt AI Chatbots

ChatGPT Assignments to Use in Your Classroom Today

Example Overview: The bulk of the book consists of over 60 practical assignment prompts and ideas across disciplines to assist with teaching skills for using ChatGPT (and other AI tools), including prompt engineering, evaluating output, analyzing texts, writing, generating content, studying, and career planning.

Recommended Use: This open resource, licensed under the

Creative Commons Attribution-Noncommercial-Share Alike 4.0 license, allows educators to remix and adapt it as needed. You can draw inspirations from the assignment ideas and prompting examples designed to help students refine their AI prompting skills while exploring diverse applications of gen AI tools.

Explore the Example: ChatGPT Assignments to Use in Your Classroom Today

AI Disclosure Agreement

Example Overview: Christopher Ostro, an Assistant Teaching Professor and Course Designer at the University of Colorado Boulder, uses an AI disclosure method in his courses. He provides students with a form to disclose their AI use, which includes the AI tools they use and how they use them. He also encourages students to link their Google Docs or Office 365 files to their submissions so he can review the revision history. If students are upfront about their AI use, Ostro does not honor code them for that paper. Instead, he uses it as an opportunity to discuss whether the student might have been too reliant on the tool.

Recommended Use: Ostro's work is licensed under the Creative Commons Attribution 4.0 International License and allows educators to remix and adapt it as needed. You can draw inspiration from his AI disclosure agreement and AI policy to help students learn how to use AI ethically in their academic work.

Explore the Example: AI Disclosure Agreement

The AI Pedagogy Project

Example Overview: The AI Pedagogy Project was created by the metaLAB (at) Harvard within the Berkman Klein Center for Internet & Society. The AI Pedagogy Project helps educators engage their students in conversations about the capabilities and limitations of AI informed by hands-on experimentation.

Recommended Use: This project features a continuously growing collection of AI assignments created by educators. These assignments can be customized to your own pedagogical values and classroom needs. These assignments cover a wide range of disciplines and AI topics, such as AI ethics and AI literacy. Use the filters to search for assignments relevant to your own needs.

Explore the Project: AI assignments

Reflect and Apply: Educator's Toolkit

Pedagogical Strategies and Considerations

Understanding AI Capabilities and Limitations

Students need a foundational understanding of what AI tools can and cannot do effectively. This understanding helps them set realistic expectations and make informed decisions about when and how to use AI in their learning process. Instructors should provide structured opportunities for students to experiment with different AI tools and evaluate their outputs critically.

Developing Effective Prompting Techniques

Prompting is a new literacy skill that requires practice and refinement. Teaching students systematic approaches to crafting effective prompts empowers them to get more useful results from AI tools. Instructors should model effective prompting strategies and provide opportunities for students to practice and receive feedback on their own prompting techniques.

Establishing Clear Guidelines for Academic Attribution

When students use AI tools in their academic work, clear guidelines for citation and attribution are essential. Students should understand when and how to disclose AI assistance in their work, just as they would cite any other resource. Developing classroom norms around AI use helps establish expectations and promote academic integrity.

Balancing AI Assistance with Student Agency

While AI tools can support learning in many ways, they should enhance rather than replace student thinking and creativity. Design assignments that require students to

critically engage with AI-generated content, add their own insights, or use AI at specific stages of a larger process that still requires substantial student input.

Fostering Collaborative Evaluation of AI Tools

As demonstrated in the AI Tool Evaluation Sprint example, having students collaboratively assess different AI tools builds critical thinking and helps them make informed choices about which tools best suit specific tasks. This collaborative approach helps students understand that different AI tools have different strengths and limitations.

Reflection Questions

- How might you adapt the open resource guide on AI-Enhanced Instructional Design to address specific learning challenges in your classroom? Consider which AI applications would best support your instructional goals and student needs.
- How could you modify the small group structure of the AI Tool Evaluation Sprint to fit your class size and format (e.g., online, hybrid, or in-person instruction)? What adjustments would ensure all students meaningfully participate in the evaluation process?

- The “How to Prompt AI Chatbots” resource introduces students to text-to-text prompting fundamentals. How might you extend this foundation to include other forms of AI interaction relevant to your field (e.g., image generation, code completion, data analysis)?
- The AI Pedagogy Project features a collection of AI assignments. After browsing the assignments related to Level 2 competencies, which assignments are you interested in adapting to your classes? How might you adapt the assignments to better align with your course learning objectives while still maintaining its core purpose?Use the Padlet Discussion Board to share your thoughts with peer educators.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=132

Made with :Padlet

Contribute: Add a Resource

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=132

Provide Feedback

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=134

LEVEL 3: EVALUATE AND CREATE AI

Alignment with AI Literacy Framework: This part bridges the “Use and Apply AI” and “Analyze and Evaluate AI” levels. It helps educators learn to guide their students to not only incorporate AI tools but also to foster critical thinking and responsible use of AI among students.

Critical Evaluation of AI Outputs

AI Literacy Framework Level 3 Evaluate and Create AI: Critical Evaluation of AI Outputs

Core Competency covered in this chapter:

- Review and evaluate AI-generated results for accuracy, relevance, bias, and quality.

Introduction

The rapid rise of AI technologies has created an unprecedented challenge to our information ecosystem, threatening both

democratic discourse and the foundations of higher education. When AI systems generate content that appears authoritative yet contains inaccuracies, fabrications, or embedded biases, citizens struggle to distinguish fact from fiction, undermining the shared reality essential for democratic functioning. Similarly, higher education's mission to develop critical thinking is compromised when students navigate an information landscape where plausible-sounding AI hallucinations compete with verified knowledge.

This module addresses this urgent challenge by providing educators with frameworks, strategies, and practical activities to help students critically evaluate AI-generated content. By developing an integrated approach that combines information, media, data, and digital literacies, we can equip students to recognize AI's limitations, verify claims against reliable sources, identify potential biases, and assess the quality and relevance of AI outputs. These skills will empower students to leverage AI's benefits while maintaining their critical autonomy and protecting the integrity of our information ecosystem.

Interactive Module: Critical Evaluation of AI Outputs

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://pressbooks.library.virginia.edu/ai-literacy/?p=137#h5p-13

Reflect and Apply: Educator's Toolkit

Core Competencies for Educators:

Educators should be skilled at guiding students on how to evaluate responses for relevance, accuracy, bias, and quality. In addition, they should be able to teach students to analyze AI results critically while iteratively refining their prompts to achieve improved outputs.

Reflection Questions

- Assessment of Current Practice: What assumptions might you be making about students' ability to critically evaluate AI outputs?
- Literacy Integration: Which of the four core literacies (information, data, media, digital) are already well-developed in your course, and which might need more explicit attention to build a complete framework for AI evaluation?

- Scaffolding Strategy: What specific scaffolding techniques would be most effective in your discipline to help students move from superficial to sophisticated evaluation of AI outputs?
- Metacognitive Development: How can you help students become more aware of when and why they turn to AI tools, and what this reveals about their learning processes?
- Balance of Experiences: How might you design learning experiences that deliberately alternate between AI-permitted and AI-restricted activities to help students understand the impact on their learning?
- Ethical Complexity: What discipline-specific ethical questions does AI use raise in your field? How can you help students navigate these complexities?

Use the Padlet Discussion Board to share your thoughts with peer educators.

One or more interactive elements has been excluded from this version of the text. You can view them online here:
https://pressbooks.library.virginia.edu/ai-literacy/?p=137

Made with :Padlet

Update Regularly: Adapting to Rapidly Changing AI Capabilities

The landscape of AI tools is undergoing unprecedented evolution, with capabilities expanding dramatically every few months. This rapid pace of development creates unique challenges for educators attempting to integrate AI evaluation into their teaching practice. Here's how to approach this dynamic reality:

Regular Capability Assessment

Establish a practice of systematically reassessing AI tool capabilities at regular intervals—ideally before each semester begins. What was impossible for AI to accomplish last term might now be within its capabilities. For example, AI systems that previously struggled with mathematical reasoning or scientific explanations may show marked improvements in newer versions.

Create a "capabilities tracking document" where you document specific examples of how AI performance has changed in your discipline. This might include:

- Examples of problems AI previously couldn't solve but now can
- Improvements in reasoning or explanation quality
- New types of creative content AI can now generate
- Changes in how AI handles ambiguity or complex instructions

Collaborative Learning with Students

Embrace the fact that your students may discover new AI capabilities before you do. Create structured opportunities for students to share their discoveries about AI capabilities, creating a collective intelligence approach:

- Dedicate class time to discussing new AI features or behaviors students have observed
- Create collaborative documentation where students can contribute examples of new AI capabilities
- Establish a "capability alert" system where significant changes in AI performance can be quickly shared across your teaching team
- Use these discoveries to collaboratively update evaluation frameworks during the term rather than only between terms

Version-Specific Assessment

Acknowledge that different students may be using different versions of AI tools, resulting in significantly different capabilities. Consider:

- Having students document which specific version of an AI tool they evaluate
- Creating comparative activities where students assess the same prompt across multiple AI systems or versions
- Discussing how these version differences might impact evaluation results
- Helping students understand that their peers might have different experiences with seemingly similar tools

Assessment of AI Impact

AI Literacy Framework Level 3 Evaluate and Create AI: Assessment of AI Impact

Core Competency covered in this chapter:

- Evaluate the impact of AI on their learning and academic work outcomes. This includes understanding how AI can enhance their academic performance and recognizing any potential limitations in AI applications
- Critique AI tools and offer arguments in support of or against their creation, use and application in their learning.

Introduction

Teaching students to assess AI's impact on their learning is like helping them navigate a powerful current that can either propel their academic journey forward or divert them from essential developmental pathways. This module delves into fostering metacognitive vigilance—equipping educators with frameworks and approaches to guide students in reflecting on how AI tools shape their cognitive processes, skill development, and knowledge acquisition. By developing structured reflection practices, students become architects of their technological integration rather than passive consumers of AI capabilities.

Interactive Module: Assessment of AI Impact

An interactive H5P element has been excluded from this version of the text. You can view it online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=138#h5p-14

Reflect and Apply: Educator's Toolkit

Core Competencies for Educators:

Help students critically reflect on the process of using AI tools and Discuss arguments in support of or against the creation, use, and application of AI tools in learning and one's specific discipline.

Reflection Questions

- What strategies would create an environment where students feel comfortable honestly discussing their experiences with AI tools without fear of judgment or academic penalty?
- How might you design learning experiences that help students identify the optimal balance between AI assistance and independent cognitive effort for different types of tasks in your specific discipline?
- What observable indicators might help students

meaningfully assess whether their AI use is enhancing or potentially limiting their learning in a particular context? How could you help them collect and analyze this evidence systematically?

- How might regular AI impact reflection activities contribute to students' broader metacognitive development, and what scaffolding would help students progress from surface-level observations to deeper insight about their learning processes?
- What institutional structures or policies might need to evolve to support students in developing nuanced approaches to AI use across their educational experience rather than receiving inconsistent or contradictory guidance across courses?

Use the Padlet Discussion Board to share your thoughts with peer educators.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=138

Made with :Padlet

Embrace Complexity: Moving Beyond Binary Judgments of AI

The question of whether AI is "good" or "bad" for education misses the richness of how these tools intersect with learning processes. A more sophisticated approach acknowledges contextual nuance and helps students develop decision frameworks for appropriate use.

Contextual Decision Frameworks

Instead of providing simple rules about when AI should or shouldn't be used, help students develop contextual decision frameworks that consider multiple factors:

- Learning objective alignment: Does using AI in this context help or hinder the specific learning goal?
- Skill development stage: Is this a skill students should be developing independently first, or is AI assistance appropriate at this learning phase?
- Task characteristics: Which aspects of a task benefit from AI assistance versus human judgment?
- Metacognitive awareness: Will students remain cognitively engaged when using AI for this purpose?

Teach students to ask these questions for specific instances rather than forming blanket judgments about AI use across all contexts.

Nuanced Use Cases Analysis

Develop class activities that explore nuanced use cases where the appropriateness of AI use isn't immediately obvious:

- Present scenarios where AI use has both benefits and drawbacks
- Have students identify the trade-offs involved in various AI integration approaches
- Ask students to articulate what might be gained and lost in specific AI use cases
- Challenge students to identify the specific inflection points where AI shifts from being helpful to potentially harmful

Developing Adaptive Judgment

As AI capabilities change, the boundaries of appropriate use will shift as well. Help students develop adaptive judgment that can evolve alongside technology:

- Encourage periodic reassessment of personal guidelines for AI use
- Discuss how past judgments about technology

appropriateness have evolved over time in other contexts
- Create reflective activities where students revisit their previous assumptions about appropriate AI use
- Have students project how continued AI improvement might shift the boundaries of when and how they would use these tools

Professional Ethics Integration

Connect students' personal decision-making about AI to broader professional ethics in their fields:

- Explore how emerging professional standards are addressing AI use in various disciplines
- Discuss how AI might transform professional practice in their future careers
- Examine real-world cases where AI use has raised ethical questions in professional contexts
- Help students articulate principled positions that could guide their decisions in evolving contexts

Acknowledging Uncertainty and Ambiguity

Perhaps most importantly, help students become comfortable with the uncertainty that accompanies rapidly evolving technology:

- Model intellectual humility by acknowledging the limits of our current understanding
- Encourage students to identify "open questions" about AI impact that don't yet have clear answers
- Discuss how technological transitions throughout history have often involved periods of ambiguity
- Help students develop comfort with provisional judgments that remain open to revision as more information emerges

Classroom Applications, Case Studies, and Additional Resources

Introduction

Incorporating AI literacy into higher education can feel like a daunting and time-intensive endeavor. This chapter highlights real-world examples of how educators are effectively teaching the competencies covered in this chapter in their classrooms. By showcasing diverse approaches, we aim to inspire and empower faculty to integrate AI literacy into their teaching practices, regardless of discipline or expertise.

Aligned with the philosophy of open educational resources (OER), we encourage the adaptation of existing approaches and resources to save time and effort while addressing the unique needs of individual educators and their students. By building on proven strategies, faculty can seamlessly incorporate AI literacy into their teaching without reinventing the wheel.

In addition to these examples, we provide effective pedagogical strategies that can be adapted to various educational contexts, along with curated resources for further exploration.

We also encourage you to contribute to this growing body of knowledge. If you have a classroom example to share, please submit it via the form below or contact us at teachingwithaioer@virginia.edu. Your insights and experiences can help shape the future of AI education in higher ed.

AI Evaluation: AI-Enhanced Instructional Design

Example Overview: This interactive open textbook, created collaboratively by University of Saskatchewan graduate students, showcases how educators can implement authentic learning experiences that develop students' abilities to critically evaluate AI technologies while explicitly connecting to media literacy frameworks. The project demonstrates how structured evaluation activities can bridge technical skills with deeper critical analysis.

Recommended Use: Educators can adapt this project-based approach to develop both students' technical proficiency with AI tools and their critical evaluation abilities. By requiring students to explicitly connect their analyses to specific literacies (information, media, data, or digital), instructors help students engage in a deeper level of critical analysis rather than superficial observation. Encouraging students to create openly licensed resources further enhances authenticity and impact, as students produce work for real audiences beyond the classroom, motivating deeper engagement with evaluation frameworks.

Explore the Example: AI-Enhanced Instructional Design Pressbook, licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

AI Evaluation: Helping Students Understand the Biases in Generative AI

Resource Overview: The University of Kansas has developed a resource that equips both instructors and students with tools to analyze and discuss biases and ethical considerations in generative AI. This resource provides foundational knowledge about different types of bias that may appear in AI outputs, complemented by practical classroom activities and a curated reading list for deeper exploration.

Recommended Use: Educators can readily incorporate the provided classroom activities to help students develop critical analysis skills for identifying and evaluating biases in both text-based and visual AI outputs. The included reading list allows instructors to assign targeted readings that align with specific course objectives or student needs, helping learners develop a more nuanced understanding of how biases manifest in AI systems and their implications for various contexts.

Explore the Resource:Helping students understand the biases in generative AI

AI Evaluation: Assess Content: Assessing AI-Based Tools for Accuracy

Example Overview: The module, Assessing AI-Based Tools for

Accuracy, provides step-by-step instructions and video examples designed to teach students lateral reading techniques for critically evaluating AI-generated content. Through clear explanations and practical demonstrations, students learn how to verify the accuracy and reliability of AI outputs effectively.

Recommended Use: Educators can directly integrate this module or adapt specific activities and video examples into their teaching to support students in mastering lateral reading techniques. Incorporating these resources helps students develop essential critical evaluation skills, enabling them to better navigate and assess AI-produced information.

Explore the Example: Assessing AI-Based Tools for Accuracy, licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

AI Evaluation and Assessment of Impact: Incorporation of ChatGPT and Other Large Language Models into a Graduate Level Computational Bioengineering Course

Example Overview: The paper "Incorporation of ChatGPT and Other Large Language Models into a Graduate Level Computational Bioengineering Course" presents a structured approach to integrating AI tools into STEM education. Throughout the Fall 2023 semester, the authors explored the use of ChatGPT and similar large language models (LLMs) in a graduate-level numerical and statistical methods course for PhD-level bioengineering students. The paper

shares examples of ChatGPT-generated content, observations on effective course integration, and speculates on how bioengineering students may benefit from this technology in the future.

Recommended Use: Educators can draw inspiration from this paper to design structured activities that encourage students to critically evaluate AI-generated outputs in STEM. By incorporating AI tools like ChatGPT into coursework, students can gain hands-on experience, allowing them to assess the benefits and limitations of these technologies in real-world applications. This approach not only enhances technical proficiency but also fosters critical thinking regarding the ethical and practical implications of AI in their respective fields.

Explore the Example:

Incorporation of ChatGPT and Other Large Language Models into a Graduate Level Computational Bioengineering Course

AI Evaluation: ChatGPT Assignments to Use in Your Classroom Today

Example Overview: The bulk of the book, developed by educators at the University of Central Florida, consists of over 60 practical assignment prompts and ideas across disciplines to assist with teaching skills for using ChatGPT (and other AI tools), including prompt engineering, evaluating output, analyzing texts, writing, generating content, studying, and career planning.

Recommended Use: This open resource, licensed under the Creative Commons Attribution-Noncommercial-Share Alike 4.0 license, allows educators to remix and adapt it as needed. You can

draw inspiration from the assignment ideas on evaluation and analysis from pages 25-52, designed to help students critically analyze and evaluate AI outputs while exploring diverse applications of gen AI tools.

Explore the Example: ChatGPT Assignments to Use in Your Classroom Today

AI Evaluation: AI Assignment Library

Example Overview: Faculty at the University of North Dakota developed the resources in this AI Assignment Library in response to the immediate impact of ChatGPT and other generative AI tools on higher education. Assignments included in this collection emerged from an intensive faculty workshop focused on generative AI and the evolving information landscape. Faculty authors participated in peer-reviewed assignment charrettes and revised their assignments based on constructive feedback.

Recommended Use: This collection offers various classroom activities designed to support students as they critically evaluate AI-generated outputs. We recommend educators browse the examples provided below and within the full database to gather inspiration and adapt activities suitable for your specific teaching contexts.

- AI and Concerns on Bias and Correctness in Engineering
- Is ChatGPT good at establishing validity? – For research
- Annotated Bibliography Assignment for an Art History Class
- Using Generative AI in the Classroom: Fact-Checking ChatGPT as Part of a Capstone Project

Explore the Example: AI Assignment Library

Reflect and Apply: Educator's Toolkit

Pedagogical Strategies and Considerations

Teaching students to critically evaluate AI outputs and assess AI's impact on their learning is a crucial pedagogical imperative for higher education. This involves a shift from merely consuming AI-generated information to fostering critical thinking and metacognitive awareness about how AI tools influence learning processes, skill development, and knowledge acquisition. The goal is to prepare students to be intentional and critical users of technology, maintaining their personal agency and human judgment in increasingly AI-integrated environments. Key pedagogical strategies and considerations for achieving this include:

Cultivating an Integrated AI Literacy Framework

Recognize that effective AI evaluation is built upon a foundational literacy ecosystem encompassing information, media, data, and digital literacies. Strengthen these interconnected literacies, demonstrating how skills in one area enhance others when evaluating AI. You don't need to be expert on all the literacies but

think about which literacies might be most relevant to your field and make sure your AI evaluation provides opportunities for students to reflect on the literacy framework. The AI-Enhanced Instructional Design Pressbookis a good example of this approach of having students evaluate AI outputs against the media literacy framework that is essential to the course.

At the same time, address existing literacy gaps proactively, understanding that students may struggle with evaluating AI outputs if they lack foundational skills in effective writing or analytical thinking. Anticipate and guide students beyond superficial critiques by explicitly teaching them what constitutes strong analytical work and what to look for beyond surface-level observations in AI outputs. Model critical evaluation by transparently discussing your own experiences with AI in teaching preparation, including benefits and limitations. Address the challenge of missed relevancy assessment by explicitly connecting AI-generated content to course readings, personal experiences, and assignment purposes.

You could also consider collaborating with other campus units, such as the writing center and the library, to provide additional resources to fill these gaps. Additionally, utilize structured frameworks, such as the TIMED model (Technology, Information, Media, Ethics, Data), to provide clarity and guide students in a systematic critical assessment of AI outputs for accuracy, relevance, bias, ethical implications, and logical coherence within disciplinary contexts.

Designing a Scaffolded Learning Journey for AI Assessment

Implement comparative experiences, deliberately alternating between AI-permitted and AI-restricted activities. This helps students develop a nuanced understanding of AI's distinct contributions or limitations in various learning contexts. Incorporation of ChatGPT and Other Large Language Models into a Graduate Level Computational Bioengineering Courseis a good

example of helping students compare AI-permitted and AI-restricted activities and self-assess the benefits and concerns. In addition, embed ongoing reflection by providing structured opportunities after AI-permitted assignments for students to examine how the technology influenced their thinking processes and the quality of their work.

Additionally, you can conclude the activities with a culminating synthesis, where students analyze their learning trajectory and identify patterns in how AI has shaped their knowledge acquisition, skill development, and academic identity. Consider providing scaffolded assessment frameworks that evolve with student experience, offering more structured guidance for beginners and more open-ended prompts for advanced users.

Fostering a Psychologically Safe and Open Learning Environment

Establish psychological safety in your classrooms where students feel comfortable sharing both successes and challenges with AI tools without fear of judgment or academic penalty. This is crucial for honest self-assessment. It's important to validate the full spectrum of student experiences with AI, recognizing that different learning preferences, backgrounds, and contexts can lead to varied impacts from the same tool.

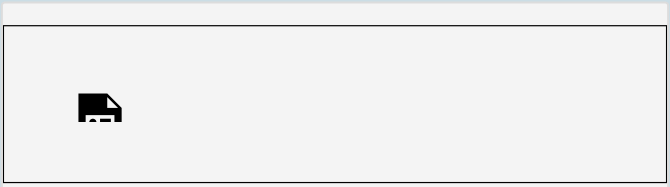
Reflection Questions

- How might you encourage students to explicitly

connect their AI analyses to specific literacy frameworks such as information, media, data, or digital literacies, similar to the example shown in AI-Enhanced Instructional Design Pressbook?

- How might you leverage open resources, such as Assessing AI-Based Tools for Accuracy, for teaching students practical techniques, such as lateral reading, to critically evaluate AI-generated content and verify its accuracy and reliability? Which staff/units at your university can you collaborate with to teach these techniques if you don't feel confident teaching yourself?
- Which of the practical assignment prompts from "ChatGPT Assignments to Use in Your Classroom Today," particularly those focusing on evaluating output and analyzing texts, can you adapt for your course objectives?
- The AI Pedagogy Project features a collection of AI assignments. After browsing the assignments related to Level 3 competencies, which assignments are you interested in adapting to your classes? How might you adapt the assignments to better align with your course learning objectives while still maintaining their core purpose?

Use the Padlet Discussion Board to share your thoughts with peer educators.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=140

Made with :Padlet

Reflection Questions

- *How might you encourage students to explicitly connect their AI analyses to specific literacy frameworks such as information, media, data, or digital literacies, similar to the example shown in AI-Enhanced Instructional Design Pressbook?*
- *How might you leverage open resources, such as Assessing AI-Based Tools for Accuracy, for teaching students practical techniques, such as lateral reading, to critically evaluate AI-generated content and verify its accuracy and reliability? Which staff/units at your university can you collaborate with to teach these techniques if you don't feel confident teaching yourself?*
- *Which of the practical assignment prompts from "ChatGPT Assignments to Use in Your Classroom Today," particularly those focusing on evaluating output and analyzing texts, can you adapt for your course objectives?*

- *The AI Pedagogy Project features a collection of AI assignments. After browsing the assignments related to Level 3 competencies, which assignments are you interested in adapting to your classes? How might you adapt the assignments to better align with your course learning objectives while still maintaining their core purpose?*

Contribute: Add a Resource

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=140

Provide Feedback

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=142

COURSE DESIGN AND ADAPTATION

Adapting Course Design for the Era of Gen AI

Introduction

This chapter explores the critical need to adapt course design in response to the emergence of Gen AI in higher education. Rather than viewing AI as just another technological tool, it presents AI as a transformative force that requires educators to rethink their teaching approaches and assessment methods in fundamental ways. While change can be uncomfortable, staying with traditional methods may no longer serve students effectively in an AI-integrated world. The successful integration of AI in education isn't about the technology itself but rather about reimagining learning goals, assessment methods, and learning activities to better prepare students for an AI-integrated future. Using Fink's backward-integrated course design framework, this chapter provides a hands-on and structured step-by-step approach for educators to imagine new teaching and learning possibilities and incorporate AI literacy effectively and intentionally.

Interactive Module: Adapting Course Design for the Era of Gen AI

Stage 1: Analyzing Situational Factors for AI Literacy Integration

An interactive H5P element has been excluded from this version of the text. You can view it online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=144#h5p-15

Stage 2: Establishing Learning Goals for AI Literacy Integration

An interactive H5P element has been excluded from this version of the text. You can view it online here: https://pressbooks.library.virginia.edu/ai-literacy/?p=144#h5p-16

Stage 3: Designing Educative Assessment for AI Literacy Integration

An interactive H5P element has been excluded from this version of the text. You can view it online here:

https://pressbooks.library.virginia.edu/ai-literacy/?p=144#h5p-17

Stage 4: Designing Learning Activities for AI Literacy Integration

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://pressbooks.library.virginia.edu/ai-literacy/?p=144#h5p-18