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# AI Literacy in Teaching and Learning: A Durable Framework for Higher Education

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## Student ALTL

### Student-Specific Definition

Students must understand, critically evaluate, and ethically apply AI technologies in academic contexts. AI Literacy in Teaching and Learning (ALTL) for students encompasses fundamental knowledge of AI concepts, responsible integration of AI tools in learning and research, and critical assessment of AI limitations and biases. ALTL emphasizes transparent and appropriate use of AI to enhance—not replace—scholarship while developing skills for an AI-integrated professional landscape. Higher education institutions play a crucial role in fostering ALTL by providing curriculum, resources, and guidance that prepare students to engage thoughtfully with AI technologies in their academic pursuits and future careers.

### Student Competencies

Student competencies in AI literacy are crucial for navigating evolving academic and professional environments. Understanding AI fundamentals and ethical considerations enables students to use AI tools responsibly and effectively, enhancing their learning and research capabilities. Critical evaluation skills ensure that they can assess AI's reliability and mitigate biases, whereas practical application skills allow them to integrate AI into

daily tasks and projects. These competencies prepare students to use AI for innovative solutions, fostering a culture of responsible AI use. By mastering these skills, students are equipped to thrive in an AI-integrated world and to become informed and ethical contributors to their fields.

## Technical Understanding

| Competency              | Description                                                                                                                                                                                                                                                                    |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fundamentals of AI      | Students must grasp the core principles of AI, including machine learning, natural language processing, and neural networks. This foundational knowledge is crucial for understanding how AI operates and what its potential applications are in various academic disciplines. |
| Application of AI Tools | Students should become proficient in using AI tools for their academic work. This includes learning to write effective prompts, utilize AI-driven study aids, integrate virtual tutors, and leverage AI research assistants to augment their learning and research processes.  |
| Hands-On Experience     | Through practical sessions and workshops, students will gain hands-on experience with AI technologies, enabling them to apply these tools effectively to their coursework and research projects.                                                                               |

## Evaluative Skills

| Competency                             | Description                                                                                                                                                                                                                                       |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Critical Evaluation of AI Tools</b> | Students need to develop the ability to critically assess the effectiveness and reliability of various AI tools. This involves fact-checking and verification of the credibility of AI sources and modifying the quality of AI-generated content. |
| <b>Assessment of AI Impact</b>         | Students should learn to evaluate the impact of AI on their learning and research outcomes. This includes understanding how AI can enhance their academic performance and recognizing any potential limitations or biases in AI applications.     |
| <b>Ethical Evaluation</b>              | Students must be trained to consider the ethical implications of using AI in their academic work. This involves understanding issues related to privacy, data security, and the potential for bias in AI algorithms.                              |

## Practical Application

| Competency                | Description                                                                                                                                                                                                                           |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Integration into Learning | Students should be encouraged to integrate AI tools into their daily learning activities. This includes using AI to personalize their learning experiences, manage their study schedules, and access AI-driven educational resources. |
| Research Enhancement      | AI literacy will enable students to leverage AI tools for enhancing their research capabilities. This includes using AI for data analysis, literature reviews, and research insights that can inform their academic work.             |
| Project-Based Learning    | Incorporating AI into project-based learning will provide students with practical experience in applying AI tools to solve real-world problems. This approach will help them develop critical-thinking and problem-solving skills.    |

## Ethical Considerations

| Competency                                 | Description                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Responsible Use of AI</b>               | Students must be educated on the ethical use of AI in their academic work. This includes understanding the importance of data privacy, the potential for AI bias, and the responsible use of AI-generated content.                                                                                                                                                        |
| <b>Development of Personal AI Policies</b> | Encouraging students to create their own ethical AI usage policies will help them navigate the complex landscape of AI in education. Providing templates and guidelines will support them in this endeavor.                                                                                                                                                               |
| <b>Vigilance in AI Application</b>         | Students should be trained to remain vigilant in their use of AI tools, ensuring that they continually assess and address any ethical concerns that arise. This includes AI transparency in all academic work, including statements about and citation of AI-influenced academic work. This proactive approach will foster a culture of responsible AI usage in academia. |

# Suggested Student Outcomes

It is important to note that specific outcomes should be developed by higher education institutions in consultation with major stakeholders and in alignment with established institutional priorities and competencies. However, in an effort to start the conversation, we suggest the student outcomes noted below. By achieving these outcomes, students will be well equipped to navigate and leverage AI technologies responsibly and effectively in their academic and personal lives. This comprehensive approach to AI literacy will prepare them to thrive in an increasingly AI-integrated world.

## Technical Understanding

| Competency                 | Outcome                                                                                                                    | Example Assessment                                                                                                                                                                                    |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fundamentals of AI</b>  | Students will understand core AI principles, including machine learning, natural language processing, and neural networks. | Students will complete quizzes and projects demonstrating their understanding of AI fundamentals, such as creating simple machine-learning models, data analysis projects, and personalized AI tools. |
| <b>Hands-On Experience</b> | Students will gain practical experience with AI technologies through interactive sessions and workshops.                   | Students will complete hands-on projects using AI tools to solve academic problems, with assessments based on their application and problem-solving skills.                                           |

## Evaluative Skills

| Competency                                | Outcome                                                                                 | Example Assessment                                                                                                                                                                                                                  |
|-------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Critical Evaluation of AI Tools</b>    | Students will critically assess the effectiveness and reliability of various AI tools.  | Students will design evaluation rubrics for AI tools and apply them in reviewing multiple AI applications, submitting a comparative analysis report.                                                                                |
| <b>Assessment of AI Impact</b>            | Students will evaluate the impact of AI on their learning and research outcomes.        | Students will conduct case studies on AI integration in their studies, presenting findings on its benefits and limitations.                                                                                                         |
| <b>Fact-Checking and AI Hallucination</b> | Students will carefully evaluate AI output for inaccuracies and hallucinations.         | Students will research and employ specific prompting techniques to reduce hallucinations, then carefully review AI output. Students will submit screenshots of prompting for verification of their work and reflect on the process. |
| <b>Ethical Evaluation</b>                 | Students will understand and evaluate the ethical implications of using AI in academia. | Students will engage in debates and write position papers on ethical issues related to AI, such as privacy, data security, and bias.                                                                                                |

## Practical Application

| Competency                       | Outcome                                                                                                                                           | Example Assessment                                                                                                                                                                                                                                     |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Integration into Learning</b> | Students will effectively integrate AI tools into their daily learning activities, including studying, personalized learning, and review of work. | Students will create personalized learning plans incorporating AI tools, with periodic reviews and adjustments based on their progress.                                                                                                                |
| <b>Research Enhancement</b>      | Students will leverage AI tools to enhance their research capabilities.                                                                           | Students will complete a research project using AI to identify specific types of sources for data analysis so as to complete annotated bibliographies and literature reviews and to present their methodologies and findings with multimodal AI tools. |
| <b>Project-Based Learning</b>    | Students will apply AI tools to project-based learning to enhance critical thinking and problem-solving skills in addressing real-world problems. | Students will work on group projects addressing real-world problems using AI, followed by presentations and peer reviews utilizing image, audio, video, and infographic AI tools.                                                                      |

## Ethical Considerations

| Competency                                 | Outcome                                                                                          | Example Assessment                                                                                                                     |
|--------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Responsible Use of AI</b>               | Students will use AI responsibly, understanding data privacy, AI bias, and ethical implications. | Students will create guidelines for responsible AI use in their studies and conduct peer reviews to ensure adherence.                  |
| <b>Development of Personal AI Policies</b> | Students will develop personal ethical AI usage policies.                                        | Students will draft and submit their AI usage policies, with feedback sessions to refine and improve them.                             |
| <b>Vigilance in AI Application</b>         | Students will remain vigilant in their use of AI tools, addressing ethical concerns proactively. | Students will participate in ongoing discussions and submit reports on their vigilance practices and any ethical dilemmas encountered. |

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