



# Designing Instruction with Generative AI

24/7 Support for Optimizing  
Teaching and Learning

**Brent A. Anders**



# Designing Instruction with Generative AI

*Designing Instruction with Generative AI* offers a novel set of tools and strategies for leveraging generative AI to create engaging and personalized learning experiences. While instructional designers are a tremendous asset to higher education, not all colleges or universities have the robust staff needed to support all instructors on staff or large student populations. Drawing on a wealth of research, professional experience, and strategic insights, this book equips new and seasoned teaching faculty and trainers with step-by-step directions on how freely accessible artificial intelligence software can assist with all aspects of the course creation and instruction process and cater to the needs of diverse learners. Each chapter offers forward-thinking and empirically validated ways to help faculty create and improve instructional materials, course design, and learning environments while supporting their digital literacies. Rather than introduce AI as a means of outsourcing subject-area expertise, critical thinking, or cognitive processes, the author instead emphasizes its potential to build on traditionally honed knowledge and foundational instructional design practices. From optimizing course alignment and accessibility practices to fostering active learning, motivation, and engagement, educators will find new solutions to common teaching and learning challenges with greater efficiency in time and capacity.

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**BRENT A. ANDERS**



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NEW YORK AND LONDON

Designed cover image: © Getty Images

First published 2026  
by Routledge  
605 Third Avenue, New York, NY 10158

and by Routledge  
4 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

*Routledge is an imprint of the Taylor & Francis Group, an informa business*

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The electronic version of this book was funded to publish Open Access through Taylor & Francis' Pledge to Open, a collaborative funding open access books initiative. The full list of pledging institutions can be found on the Taylor & Francis Pledge to Open webpage.

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ISBN: 978-1-032-94018-2 (hbk)  
ISBN: 978-1-032-93925-4 (pbk)  
ISBN: 978-1-003-56854-4 (ebk)

DOI: [10.4324/9781003568544](https://doi.org/10.4324/9781003568544)

Typeset in Avenir & Dante  
by KnowledgeWorks Global Ltd.

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# Acknowledgments

I want to start by giving special appreciation to my friends and colleagues (professors, other faculty, librarians, and other staff) in academia from all over the world. I want to give thanks to all of my other friends and colleagues on Twitter (X), YouTube, and LinkedIn, from whom I continue to learn and develop as we all work to increase everyone's AI literacy and improve instructional design to enhance the educational experience for both students and faculty. I am grateful for our advanced AI tools and for our human community of inquiry, where we can all work together to help one another, as well as the rest of academia around the world, in succeeding in this ever-changing world of AI.

Additionally, a very special thank you to my beautiful family, Nelli, Eva, and Lileth, as well as my extended family, for supporting me while I wrote this important book. I also would like to acknowledge and thank the wonderful readers of this book: teachers, professors, general instructors, students, librarians, and others for actively working to professionally develop their skills and capabilities to be better teachers and academics as they enhance the teaching and learning process while preparing students for the new world around them. Finally, and as always, a special thank you to my Lord and Savior, Jesus Christ.

# Understanding Generative AI

# 1

## Defining AI

All of us, including all faculty and students, now have access to advanced free generative artificial intelligence (AI) such as ChatGPT from OpenAI as well as many others from companies such as Google, Microsoft, Anthropic, and Apple. But what is generative AI and regular AI for that matter?

**Artificial Intelligence (AI):** A field of study as well as a computer system (code and algorithms) purposefully designed to perform, create/act, reason, and learn, as it simulates a human mind and its intelligence capabilities ([Google, 2024](#); [IBM, 2024](#)).

**Generative Artificial Intelligence:** A specific sub-type of AI that allows for normal conversational-type interaction by a user via regular text, audio (spoken instruction), visual commands, or other means (ex. combination such as text + image prompting/questioning). This generative AI can then respond in a human-like way, to the user via multimodalities such as text (essays, reports, computer code, poems, scripts, etc.), images, or audio/video ([Baidoo-Anu & Ansah, 2023](#); [Morris, 2025](#)).

Although there isn't 100% agreement on the different types of AI, it is generally best explained as AI based on *capability* and AI based on *functionalities* ([IBM, 2023](#); [ISO, 2025](#)).

### AI Based on Capabilities

1. **Narrow AI** (*weak AI*): An AI trained to perform a single or narrow task. This is the only type of AI that actually exists in the world at this time. Even advanced multimodal AIs, like those used by OpenAI's ChatGPT, are still considered Narrow AI because it cannot function beyond what it was specifically trained on and doesn't meet the threshold of General AI.
2. **General AI** (*strong AI*): A theoretical concept of an AI that could utilize prior learning to accomplish new tasks without the need for human-lead training. It would be self-learning, fully adaptable, and could function on the same intellectual level as a human being.
3. **Super AI** (*artificial superintelligence*): Another theoretical concept of an adaptable AI that could "... think, reason, learn, make judgements and possess cognitive abilities that surpass those of human beings" (IBM, 2023, para. 9). Its capabilities would be beyond human understanding and could even achieve emotions, with its own beliefs and desires.

### AI Based on Functionalities

1. **Reactive Machines:** AI systems without long-term memory that were created with predefined rules to accomplish specific task operations. These simpler AI systems use data sets to make direct predictions as used by examples such as IBM Deep Blue chess-playing recommendations, Netflix movie recommendations, or Amazon/Alibaba purchase recommendations.
2. **Limited Memory AI:** AI systems with some memory to recall past data but cannot retain that data for long periods. Prime examples of this type of AI are ChatGPT and self-driving cars that use limited memory to understand the current situation-context to best predict/adapt to what is requested or needed.
3. **Theory of Mind AI:** An AI system that would have aspects of a general intelligence in that it would be able to perceive and understand emotional states and tones through voice-visual analysis. It would be able to use that emotional understanding to better predict and respond to the world and posed requests.
4. **Self-Aware AI:** A currently theoretical AI system that would not only have the capabilities described in Theory of Mind AI but would also possess a human-like consciousness with reflective capabilities to comprehend its own emotional state and existence within the world around them.

These aspects and current limits of AI will continue to evolve and change as AIs become more advanced and capable of doing much more.

## Brief History of AI in Education

AI integration with education has a long history yet the release of generative AI, such as ChatGPT, is a historical monumental leap in development. The use of AI in education dates back a hundred years if we consider teaching machines such as those developed by Sidney Pressey in 1924 and B. F. Skinner in 1954 (Benjamin, 1988; Namatherdhalala, et al., 2022). Yet these early specialized “teaching machines” used levers and cranks to provide specific static feedback based on students’ limited input. Now, thanks to the release of OpenAI’s ChatGPT and other generative AIs, the type of input/interaction between a student and the “teaching machine” AI is virtually limitless (Anders, 2023; Wu et al., 2023).

As of November 2022, use of AI in education became truly democratized in that OpenAI released the ChatGPT AI (hosted for free on their website) to the entire world. Now, everyone (both students and faculty, as well as the general public) has access and free use of an advanced generative AI system. This new implementation was truly historic in that there is no longer a need for a dedicated machine or infrastructure, and interaction with the AI is done through simple conversational English (no coding needed). This continually advancing new technology is truly revolutionary in that it has been shown to improve processes and results in teaching and learning, yet adoption is slow and difficult in some areas (Almasri, 2024; Salinas-Navarro et al., 2024; Wu & Yu, 2024).

With the sudden ubiquitous availability of generative AI, education has struggled to adjust. Some schools have implemented bans on the use of generative AI and many educational institutions, at all levels and throughout the world, have struggled to properly address issues related to the use of AI in violating academic integrity, as highlighted by the University of Hong Kong education professor Cecilia Ka Yuk Chan’s research in developing a comprehensive AI educational policy (2023). Many in academia have still not been properly trained on how to use AI, which has caused faculty to not realize its potential in improving the teaching and learning process and has led to struggles in understanding and adapting coursework and instruction to properly deal with the newly available AI technology (Antonenko & Abramowitz, 2023; DEC, 2024; Familoni & Onyebuchi, 2024).

Instructors’ struggles with AI have heightened in that several surveys and research have shown that many students have now gravitated to using AI in

## 4 Designing Instruction with Generative AI

that they believe it greatly assists them in learning and can empower their own educational agency (Coffey, 2024; DEC, 2024; GoStudent, 2024; Li et al., 2024). Due to the power and flexibility of generative AI, students are using it to help with studying and educational success in that it can provide multiple examples, express information at different cognitive levels, create practice quizzes, provide feedback, flashcards, games, and simulations, whatever is needed to help the student better learn and understand the material (Baillifard et al., 2025; Sami et al., 2025; Simelane & Kittur, 2025). However, like teachers and professors, most students have never been fully and adequately trained on how to use AI effectively or ethically; they lack AI literacy.

In order to completely understand and use generative AI to its full potential (ethically and efficiently), and to best use it within the teaching and learning process, we must develop AI literacy (Anders, 2023; Şenocak et al., 2024).

### Summary

This chapter helped to define AI and its different forms. It expressed what AI is through its capabilities and functionalities. Additionally, a brief overall history of AI in education was presented in order to gain a greater insight into AI's development and how it can now be used to greatly enhance instructional design to improve teaching and learning. This information will help to better understand the vital necessity of AI literacy.

# AI Literacy

# 2

## AI Literacy Overview

Artificial intelligence (AI) literacy (generally considered as part of digital/media literacy) has many definitions, but a good overall description is “... a set of competencies that enables individuals to critically evaluate AI technologies; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace” provided by AI media professors and researchers Duri Long and Brian Magerko from Georgia Institute of Technology (2020, p. 2).

AI literacy is now a must-have skill for students, instructors, as well as anyone in the modern world. Groups and organizations such as the European Union, the United States, the United Nations, the World Economic Forum, and many other countries (to include BRICS) have all come out and expressed the urgency in ensuring that all people develop these needed AI literacy skills in order to effectively perform in the job market and to function as modernized citizens (Bengio, 2025; EU, 2024; MFARE, 2023; UN 2024; UNESCO, 2024a; US Dept. Edu., 2024; WEF, 2024; Whittacker & Jenkins, 2024). This necessitates the incorporation of AI into the teaching and learning process, not only using AI tools but also teaching aspects of how to use, fully harness, and ethically utilize the power of AI.

To better understand the concept of AI literacy, I have organized it into four specific concepts: Awareness, Capability, Knowledge, and Critical Thinking (Anders, 2023). Each of these important concepts needs to be fully understood to best grasp the general complexities and imperative need of AI literacy overall.

### *AI Literacy Concepts Overview*

**Awareness:** AI is now truly all around us and is impacting society in many different ways (both good and bad). The key issue with this component of AI literacy is that we must be conscious and fully mindful that AI is making many different decisions and can influence and affect us in a multiple of ways.

**Capability:** The greater one understands the many, near limitless possibilities with different AIs, along with development in being better able to use the AI (through prompt engineering), the greater one's capability and power will be.

**Knowledge:** We must all now know that AI is accessible to everyone: faculty, staff, students, businesses, governments, everyone. With that information, we need to also know that different people and groups will be using it in different ways, both good and bad (deepfakes and scams). Additionally, we need to develop an understanding of AI terminology and know the safety and security of our personal data and interactions with the AI itself.

**Critical Thinking:** To be able to understand and use AI effectively and properly all must develop a critical awareness to always question and verify any and all information provided by an AI system. Special attention must also be given to biases that may exist within the system, ethical considerations, physical/environmental ramifications, and issues with overreliance.

### **AI Literacy Component 1: Awareness**

The fact that AI is all around us and is now a major part of everyone's lives has been expressed by a wide range of groups such as Forbes, International Monetary Fund, MIT, the Museum of Science, Northern Northrop Gumman, the UN, and the US White House (Foodman, 2023; Georgieva, 2024; Heikkila & Heaven, 2024; MC, 2024; McKinney, 2024; MoS, 2024; White House, 2023; UN, 2024b). This awareness is key and correlates with the United Nations AI framework that focuses on a human-centered mindset that asserts human agency in relation to AI (UNESCO, 2024b). Everything from results and recommendations from search engines, social media, online stores (like Amazon, Alibaba, Temu), and streaming media services (like Netflix, Hulu, Spotify) to online dating apps and government legislation assistance programs, all use AI in some way (Figure 2.1).

## AI Literacy

<b>Awareness</b>	AI is all around us and is being more and more integrated with everyday life. It is affecting society in ways that are both good and bad.
<b>Capability</b>	Different AIs have different capabilities and limitations. Development of one's capabilities in using AI through prompt engineering (using an advanced prompt formula).
<b>Knowledge</b>	AI is now available for free to everyone. It is important to learn AI terminology to better understand AI concepts and practices. Data safety/security must be maintained. AI can be used for both good and bad ( <i>deepfakes/scams</i> ).
<b>Critical Thinking</b>	All AI responses must be critically analyzed and verified. Understand AI bias and ethical issues. Humans must remain in the loop. What are AI environmental and health effects. Avoid overreliance on AI.

Figure 2.1 “AI Literacy” infographic.

Search engines continue to evolve but have been using AI in different ways for a long time; Google first used AI as part of its search engine in 2015 (Schwartz, 2022). At first search engines used AI in the background to help with understanding and answering queries. Now, search engines incorporate direct AI results and provide that advanced information along with regular search engine query result recommendations. We should be aware that what we now see as most pertinent and top available results is often determined by AI.

Social media has become a very influential part of many people's lives and is also mainly controlled by AI. As many as 63.9% of the world's population use some form of social media (such as Facebook, Instagram, or YouTube) for an average of 2 hours and 20 minutes daily (BL, 2025; Statistica, 2024a). Recommended follow-on video and text posts are determined by different AI systems (Grandinetti, 2023; Ienca, 2023). This is powerful and beneficial in helping the viewer see information and content that they want to see, but this also often creates a silo effect and prevents people from seeing alternative perspectives or points of view. Media streaming services like Netflix and others function in the same way. Although AI is very helpful with recommendations, it can prevent someone from being exposed to new and different aspects or possibilities. All must be aware of how AI is affecting the content being presented to us within these types of social media services.

Online dating apps are another very interesting and powerful utilization of AI in that it very directly affects society. Online dating apps result in 40% of marriages in the United States, with 381 million people using online dating apps worldwide (expected to reach 452 million by 2028), (Statistica, 2024b; Tropiano, 2023). AI is now widely used in different ways within dating apps to help people find a matching partner (Luzan, 2024; Paul & Ahmed, 2024). We must be aware that, as a society, we are now allowing AI to determine who connects with whom to determine our future generations. Good or bad this is a realization that must be purposefully known and contemplated. What might future consequences be, and are we as a society OK with that?

Many different governments around the world have now started to use AI in different ways as well. In an effort to maximize transparency, the US government has created a website (<https://ai.gov/ai-use-cases>) dedicated to expressing how it is using AI technologies to help with administrative and processing practices (AI.gov, 2024). A recent official report titled *Use of Artificial Intelligence in Government*, from the UK National Audit Office, expressed that “The most common purposes of deployed AI are to support operational decision-making or improve internal processes” (NAO, 2024, p. 8). In Japan, AI is being heavily used in law enforcement as part of its crime reduction through AI crime prediction system and in the military for detecting and identifying targets using radar and satellite images, intelligence collection and analysis, in unmanned military assets, to augment command and control, cybersecurity, logistics support, and to help make administrative work more efficient (Japan, 2024; Johnson, 2024). As a final example, India has started using AI to help with overall organization of government data in an effort to improve efficiencies in helping its citizens access information and services (EY, 2024). The World Economic Forum has even stated that:

Artificial intelligence already plays a crucial role in the decision-making processes of many companies and is increasingly used to inform policy and public sector decisions around the world. ... we think that future competitiveness may not only be about who has the most advanced AI, but also how this technology is used for strategic decision-making. This will ultimately influence the competitiveness of companies and countries in the age of AI.

(Meissner & Narita, 2023)

There are many other ways that AI is now used by everyone in daily life. AI is used in car service apps such as Uber, Lyft, Yandex, as well as GPS apps

like Google Maps and Waze to determine best routes, road conditions, and more (Sovorel, 2024). It is used in satellite communications, in sending signals to smartphones, and is now an aspect of most phone apps. AI is now part of virtually everyone's lives, and people need to be aware of it in order to make better informed decisions.

## AI Literacy Component 2: Capability

In order to obtain the greatest ability to use AI for one's own enhancement, it is important to understand that there are different generative AI providers and that developing interaction skills (ability to best ask questions or give commands: prompt engineering) will yield the best results.

### *Different Generative AI Providers*

The previous chapter explained that there are different types of AIs in general (broken down by capabilities and functions), but even within generative AI there are different AI providers and types of generative AIs.

*OpenAI (ChatGPT):* <https://chatgpt.com>

OpenAI is considered the most famous generative AI company due to its release of ChatGPT on 30 November 2022 (OpenAI, 2022). This event was historic in that it became the fastest-growing application to have ever obtained over a million users in just five days (Marr, 2023). OpenAI was originally founded by technology and machine learning experts Sam Altman, Greg Brockman, Elon Musk, Ilya Sutskever, Wojciech Zaremba, and John Schulman in December 2015. An early founding document states:

OpenAI is a non-profit artificial intelligence research company. Our goal is to advance digital intelligence in the way that is most likely to benefit humanity as a whole, unconstrained by a need to generate financial return. Since our research is free from financial obligations, we can better focus on a positive human impact.

(OpenAI, 2015)

OpenAI is now considered a for-profit AI company and is used by 92% of Fortune 500 companies (Hu & Chmielewski, 2024).

ChatGPT is the main way that most people interact with this generative AI model although it can also be accessed through an API (application programming interface) that allows for third-party programs to access OpenAI's foundational AI models (in this case, a large language model: LLM, because it focuses on natural language processing: NLP). The exact generative AI model used by ChatGPT is always being advanced and modified (example: GPT 3.5 to GPT 4, GPT 4.5, to OpenAI o1, o3 ...). ChatGPT provides access via both a free version and a paid (Plus) version. It is considered one of the better AIs for use in any and all tasks to include: text analysis and creation (multilingual), code review and creation, audio/video/image processing and creation, and even assistance with math problems (Pocock, 2024). Microsoft Copilot AI uses OpenAI's AI within its systems via licensing agreements and heavy investing within OpenAI itself (Microsoft, 2023; Muchmore, 2024). This is important to know as an instructor in that some of the key capabilities/features that are only available via ChatGPT Plus can be accessed for free via Microsoft simply by having a Microsoft account.

*Microsoft Copilot:* <https://copilot.microsoft.com>

Microsoft Copilot is the current name for its AI offering, which is integrated into many of its services and applications (Microsoft, 2024; Wiggers, 2024). This AI is a fine-tuned version of OpenAI's AI and offers its users access to advanced features of OpenAI.

*Google AI:* <https://gemini.google.com>

Gemini AI, previously called Claud AI, is a separately developed AI model from Google (Alphabet) (Hslao, 2024). It is similar to OpenAI's model regarding features and capabilities as well as offering free services and increased features/limitations with a paid subscription. A difference with Google AI is that it is also integrated within the Google ecosystem, meaning within Gmail and other Google apps (Google Docs, Google Photos, etc.). Google AI can be accessed for free by simply having a Google account and additional capabilities and services can be accessed with an advanced account (Google One, 2024).

### *Anthropic AI (Claude): <https://claude.ai>*

Anthropic AI is another powerful AI system that uses a separate, originally created foundational model (Claude) (Anthropic, 2024; Morrison, 2024). It is considered a strong competitor in the AI world, was once considered the very best AI system available and is still viewed as the best AI for coding (Madan, 2025; Morrison, 2024). Anthropic was founded by former DeepMind (AI research laboratory subsidiary of Google) co-founder Demis Hassabis. Anthropic AI offers a multiple of access options with different capabilities and services: Free, Pro, Team, and Enterprise.

### *Grok: <https://x.com/i/grok>*

Grok AI is another foundational model that many people still haven't tried in that initially, it was only available to Twitter (X) users who had a paid subscription. Since December 2024, however, a free version of Grok has become available. Grok is a very powerful AI foundational model that is comparable to ChatGPT and has placed number one in AI leaderboards (HuggingFace, 2025). Additionally, images can be directly made within the Grok AI interface. Grok also offers a subscription plan that is tied directly with access to Twitter (X): Free, Basic, Premium, and Premium+ (Grok, 2024, 2025).

### *Perplexity AI: <https://www.perplexity.ai>*

Perplexity AI is often thought of as another foundational model because it is a separate company and its results seem different than other AIs, but it does not have its own foundational model (Perplexity, 2024a). The main power and difference with Perplexity AI is that although it uses other pre-trained models from OpenAI or Anthropic, it also uses current information from the Internet (Perplexity, 2024b). Its results always provide reference links on what was used for its answer and for additional information. Perplexity AI also offers a two-tiered access model, Standard (free) and Professional (monthly paid subscription with additional access and capabilities).

### *Other Models*

There are a multiple of other foundational AI models, to include open source models such as from Meta and a multiple of Chinese AI competitors (like

DeepSeek), but that is beyond the scope of this document (Meta, 2024; Soo, 2025). There are many AI tools and systems out there. Some use the AI foundational models listed, others use additional AI models. The listing provided are the most current and powerful generative AI models easily available to students, faculty, and staff.

It is important to know that other powerful AI models exist beside the ubiquitous “ChatGPT” and how to access them so that different AIs can be accessed when needed. If using a free account, one might run out of interactions allowed with one AI and can then switch to another AI. It is also important to periodically check on the ever-changing different capabilities and strengths of each AI model in order to use the best model for the task at hand (use the right tool for the job). We must all be critical consumers of AI. I often use different AIs, compare the results, and then use whichever provides the best answer and/or results. Now that we know that there are a multiple of foundational AI models (and how to access them), we need to learn how to best interact with a generative AI model in order to get the best results possible.

### *Prompt Engineering*

The ability to effectively ask questions and pose tasks to generative AI is referred to as prompt engineering and is one of the most important skills that academia should be helping students develop. Although anyone can ask an AI like ChatGPT a question or give a task, those with prompt engineering skills can obtain greater responses, resulting in greater effectiveness and efficiencies. As an example, there is a large difference between the use and results of a simple prompt, such as “write an essay about the benefits of exercise,” versus the improved results from using an advanced prompt:

Please assume the role of a professional kinesiologist. Write a 700-word news article on the physical and mental health benefits of exercise. Begin by introducing the general importance of regular physical activity. In the body of the article, discuss how exercise improves cardiovascular health, supports weight management, and enhances mental well-being. Write and format this article via the Associated Press writing style. Include an analysis of the long-term benefits of consistent exercise on aging and cognitive function. Conclude with practical recommendations for incorporating exercise into daily routines. I am teaching a journalism course to university students and want to give

them an example news article. Do you understand, and is there any other information you need to give me the best result possible?

This advanced prompt uses an advanced prompt formula which is the incorporation of specific components when creating questions/tasks for the AI. These components consist of: Task, Instructions, Context, Reasons, and Clarification. An important additional aspect is to remember that prompting an AI is not a one-and-done process; it is a conversation (Refinement). This means that you can continue to modify the AI's results as well as ask it to try again with any requested changes in order to give you an even better result.

### **Prompt Engineering Advanced Prompt Formula Components**

**Task:** What do you want the AI to do (“Write a ... news article”)

**Instruction:** Specifics on how you want the AI to accomplish something (“700-word ... on the physical and mental health benefits of exercise. Begin by introducing the general importance of regular physical activity. In the body of the article, discuss how exercise improves cardiovascular health, supports weight management, and enhances mental well-being. Write and format this article via the Associated Press writing style. Include an analysis of the long-term benefits of consistent exercise on aging and cognitive function. Conclude with practical recommendations for incorporating exercise into daily routines.”)

**Context:** The perspective or viewpoint you want the AI to take or personify (“assume the role of a professional kinesiologist”)

**Reasons:** Why or background to help the AI better create a response (“I am teaching a journalism course to university students and want to give them an example news article”)

**Clarification:** Give the AI an opportunity to ask questions and to ensure all needed info has been presented to the AI (“Do you understand and is there any other information you need to give me the best result possible?”)

**Refine:** Remember that interacting with AI is a conversation. Follow-on questions or modifications can continue as necessary until full information is obtained or the best product is created (answer or made result)

Some more innovative techniques when using an advanced prompt formula are the use of One-shot Prompting and Zero-shot Chain of Thought. With One-shot Prompting you would simply provide an example response or an example file to aid the AI in better understanding the task at hand (Meskó, 2023). Sometimes this can improve the overall result, but it isn't always needed so this should be something you experiment with. Zero-shot Chain

of Thought is done by simply adding the phrase “Let’s think step-by-step” to aid the AI in processing through the prompt in a more systematic, reflective, and slower manner that can sometimes result in a better outcome (Kojima et al., 2024). This has now become a feature known as “Deep Research” in many different AI models.

In addition to needing this AI literacy skill in order to obtain the best results and increase your overall effectiveness and efficiencies, having prompt engineering skills has been specifically expressed as an important and in-demand skill within the job market by groups such as Adobe, LinkedIn, and Forbes (AE, 2024; Kimbrough, 2025; Smith, 2024; Wells, 2024). This is important to remember when helping students develop their own prompt engineering skills as part of their overall AI literacy.

Note that using an advanced prompt formula is useful both when interacting with an AI via text input as well as when interacting with an AI via voice interaction, document/image upload, or while live sharing a screen or camera. In all interaction cases, you can use the advanced prompt formula to provide clear guidance and instruction to obtain the best response possible from the AI.

### AI Literacy Component 3: Knowledge

The Knowledge component of AI literacy deals with understanding that all people now have access to generative AI, the safety and security of data provided to AI, AI terminology, and knowing that AI can be used in both beneficial and nefarious ways.

#### *All Can Access Generative AI*

OpenAI truly democratized AI when it made ChatGPT publicly available to everyone on 30 November 2022 (OpenAI, 2022). Then, due to the nature of competition, multiple companies (Google, Microsoft, Anthropic, Perplexity, Meta, and others) came out with their own generative AI offerings, each with free access options to this powerful tool. Additionally, open source implementations of AI are now freely available that allows people/groups to use AI on their own computers and cellphones. This now means that everyone, all students, all faculty, all citizens, all businesses, and even governments can now access and use very powerful modern generative AI tools. This is important to understand in that those that don’t develop AI literacy skills will not be

able to effectively compete with people/businesses that do have and use these skills. Additionally, as governments and businesses start to use AI more and more, citizens will need to have developed AI literacy skills in order to best access information and use resources/services.

## *Safety and Security of Data Provided to AI*

Another key aspect of the AI literacy component of Knowledge is an understanding of how one's personal data is used and if it is safe and secure. Each AI system/company is different, so although it might not be everyone's favorite thing to do, ensure that you review the terms of service whenever you sign-up for an AI system such as OpenAI's ChatGPT. Be sure to understand how your information (as well as your students' info) will be used. Is it safe, is it secure, and are you OK with how your information will be handled? Additionally, is this in accordance with the educational institution you are working for? OpenAI specifically states, "If you do not want us to use your Content to train our models, you can opt out by following the instructions in this Help Center article ..." (OpenAI, 2024c, para. 21). Additionally, in their Privacy Policy, they state "We may also aggregate or de-identify Personal Data so that it no longer identifies you and use this information... to analyze the way our Services are being used, to improve and add features to them, and to conduct research" (OpenAI, 2024b, para. 18). This is for the free version of ChatGPT. Ensure that you fully know how your information will be used.

## *AI Terminology*

In order to better understand AI overall and develop AI literacy, we should have a mindset of lifelong learning and increase our knowledge of key AI terminology. Although this book has already introduced a multiple of AI terms and its definitions, and has a full glossary, here are some key AI terms that everyone should be aware of in order to continue to improve their understanding of generative AI:

**AGI:** This stands for Artificial General Intelligence (also referred to as "strong AI") and is a theoretical concept of an AI that could utilize prior learning to accomplish new tasks without the need for human-lead training. It would be self-learning, fully adaptable, and could function on the same intellectual level as a human being.

**Artificial Intelligence (AI):** A field of study, as well as a computer system (code and algorithms), purposefully designed to perform, create/act, reason, and learn, as it simulates a human mind and its intelligence capabilities (Google, 2024; IBM, 2024).

**GPT (Generative Pre-trained Transformer):** This is a type of deep learning large language model, originally created by OpenAI, that uses transformer architecture (neural network) to create human-like text (conversational text) based on submitted prompts.

**Hallucinations:** The creation of text or information that is inaccurate or nonsensical but confidently presented as if it were correct. This can sometimes occur if the AI model has incomplete or ambiguous information to provide a factual/valid answer but still provides a plausible-sounding answer.

**LLM:** This stands for Large Language Models and is a type of foundational model that specifically focuses on natural language processing. This AI model has been trained on a large amount of textual data and is designed to understand, generate, and manipulate human conversational language.

**Machine Learning:** A field of study within AI that deals with training algorithmic models to understand and learn statistical patterns from data. With machine learning, these models are able to learn from databases/datasets, instead of being directly programmed by a human to perform a task/process (such as decisions or predictions based on identified patterns).

**Neural Network:** A machine learning model inspired by the structural nature of the human brain. It is made up of interconnected nodes (neurons) that processes/learns patterns that emerge from data provided. It then adjusts internal parameters (weights) to make predictions and/or classifications by recognizing the complex patterns from the inputs provided.

**NLP:** This stands for Natural Language Processing and is a field of AI that focuses on the interaction between natural (conversational) human languages and computer languages. It specifically deals with computers' ability to understand, interpret, and then create human language in a useful way.

There are many more terms to learn and understand, but these are keywords and phrases that everyone should comprehend to better understand generative AI overall.

### *Beneficial and Nefarious Uses of Generative AI*

An important aspect of the Knowledge component of AI literacy is in the realization that generative AI can be used for both good and bad. It is an ongoing duality to be fully cognizant of so as to be prepared and aware.

One example of a positive use of generative AI includes translation services. Generative AIs such as ChatGPT can now be used to not only translate text, images of text, and audio, but can also be used during a conversation to act as a real-life simultaneous translator (OpenAI, 2024). Here is an example implementation: <https://youtu.be/WzUnEfilqP4>.

There are many other positive applications and uses of generative AI such as special effects in movies where AI technology is used to complete a movie where an actor passed away or when the actor needs to be older/younger and, of course, to aid with creation of learning content in different ways. AI can be used to create learning content in multimodalities to help with comprehension and learning, as well as to aid people with disabilities or anyone with special needs. Other great uses of generative AI include: product design and development, medical review, diagnostics and explanation, marketing analysis, immersive entertainment such as gaming, companionship through interactive discussions, and much more. Sadly, there are also negative ways that generative AIs can be used.

Generative AI has been used by some in very negative and harmful ways, such as through the creation of deepfakes to scam and deceive others. A deepfake is defined as “an image or recording that has been convincingly altered and manipulated to misrepresent someone as doing or saying something that was not actually done or said” (Merriam-Webster, 2024). However more and more the term “deepfake” is being used for anything digital that is false. Note that it isn’t generative AI that is bad, it is people using generative AI in negative and harmful ways.

A recent infamous example of a deepfake occurred when scammers tricked an employee of an international firm in Hong Kong into transferring 25 million dollars into their account (Chen & Magamo, 2024). The scammers used deepfake technology to appear to be several different people, including the company’s Chief Financial Officer during a conference call. The deepfake characters looked and sounded so realistic that the employee was convinced they were real and transferred the money as requested.

Deepfake-type of technology has been used to depict famous individuals in compromising positions (fake nudes/sexual videos) as well as for political propaganda, either for or against the official up for reelection (AI Team, 2024; Chen & Magamo, 2024). A CNN news article highlighted this negative issue by stating “Authorities across the world are growing increasingly concerned at the sophistication of deepfake technology and the nefarious uses it can be put to” (Chen & Magamo, 2024, para. 13).

The different ways that AI technology can be used is an important aspect of AI literacy and needs to be realized by everyone, both young and old in order to prevent people from being deceived and scammed. The following

**TRAP Test: How to Spot a Deepfake & Not Be Deceived**

<b>T</b>	<b>Think Critically:</b> Critical awareness, question any digital text, audio, or video. A mindset of ensuring objective truth within reading, seeing, & hearing.
<b>R</b>	<b>Realistic/Reliable/Reputable:</b> Does this seem real, is it likely to be occurring? Is the source of this reliable & reputable, is the source credible & trustworthy?
<b>A</b>	<b>Accurate/Authority:</b> Are all parts of the media accurate; any inconsistencies? Does this correlate with other things we know? Is the source an authority?
<b>P</b>	<b>Purpose/Propaganda:</b> What is the purpose of this media? Is it trying to sell me something, to change my view, or vote? Is it propaganda, bias, & misleading? Is there more to this story?

Figure 2.2 “How to Spot a Deepfake & Not Be Deceived” infographic.

infographic expresses this importance and offers a convenient and easy-to-understand acronym (TRAP) in order to help people better address and protect themselves from deepfakes that can be generated with AI (Figure 2.2).

Please note that this TRAP test is built upon the efforts of hard-working librarians that came up with the original CRAP (Currency, Reliability, Authority and Purpose/Point of View) and CRAAP (Currency, Relevance, Authority, Accuracy, and Purpose) tests that my new test, dealing with AI, is based on (Beestrum & Orenic, 2008; Blakeslee, 2004).

**T: Think Critically:** All people must now have a critical awareness and question any digital text, audio, or video in that AI technology has advanced to a point where any digital content can be convincingly created with AI. We must all now have this critical mindset to help ensure objective truth by using critical thinking when evaluating anything digital while reading, seeing, and hearing.

**R: Realistic/Reliable/Reputable:** When exposed to digital content now, we need to ask ourselves, “Does this seem real, is it likely to be occurring?” Further, we must ask “Is the source of this reliable & reputable; is the source credible & trustworthy?” We cannot blindly accept something because it looks real. We need to critically evaluate by asking questions.

**A: Accurate/Authority:** We now need to continue to investigate authenticity by asking “Are all parts of the media we are observing accurate and are there any inconsistencies?” Additionally, we need to think and ask “Does this correlate with other things we know? Is the source an authority?”

**P: Purpose/Propaganda:** Finally, we need to really consider the purpose of this media being reviewed. “Is it trying to sell us something, to change

our view, or vote? Is it propaganda, bias, & misleading? Is there more to this story?” By asking and knowing more, we are better able to make decisions and less likely to be deceived and/or scammed.

By knowing that all now have access to generative AI, realizing the importance of data safety and security, developing a greater grasp of AI terminology, and seeing how AI can be used for good and bad purposes (and how to fight nefarious uses with the TRAP test), one will have an enhanced understand and development with the Knowledge component of AI literacy.

## AI Literacy Component 4: Critical Thinking

The great 20th-century American teacher, author, and educational philosopher John Dewey referred to critical thinking as “reflective thinking” and explained it as “active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends... something is believed in (or disbelieved in), not on its own direct account, but through something else which stands as witness, evidence, proof, voucher, warrant” (1910, pp. 6–8).

The key parts to take from John Dewey’s definition are “careful consideration of any belief” and the important need for “evidence, proof” to verify the information provided. We all need to understand and remember that AI is not perfect. It isn’t omniscient and although it uses logic, that doesn’t mean it will always provide the right logical answer. Additionally, we must consider other important aspects that require critical thinking to address aspects such as bias, ethical uses of AI, environmental/physical effects of AI, and overreliance.

### *Hallucinations*

Hallucinations is a term that is common within AI to describe a generative AI response/result that is false but expressed in a confident manner as if it were correct (Achiam et al., 2023). Common examples of this are if an AI gives made up information regarding facts and figures, names, dates, or references.

As a more specific example, I once asked an AI to write an example essay dealing with democracy in the country of Armenia and to include at least three references. In this instance, two of the references were correct but one was made up. The author was a real author who had written about the topic,

but it didn't correctly coincide with the title or link. The publisher was a well-known publisher (Routledge), but the actual overall reference was made up and incorrect. It looked confidently real, but was false.

Although rates of hallucinations within AI models continue to fall, we must always understand that AI can make mistakes, just like a human subject matter expert could make a mistake (HHEM, 2025). This could be due to not being pretrained with pertinent information, having outdated information, or simply by not taking additional possibilities into account. For this reason, we need to always keep the human in the loop and verify all information from AI.

### *Bias*

The issue of bias should also be considered in that any system will have some level of bias based on the information it was trained on and the AI scientist controlling how the AI responds. Guardrails placed on public-facing AI responses are a prime example of this. These guardrails are often used to modify an AI response so that they do not provide offensive or dangerous answers (think what is the best religion or how do you make a bomb) or even to help reduce bias, yet they can still be bias in different ways. An AI that was created in Silicon Valley, in California, within the United States, will be biased in a different way than an AI created in China, or Russia, or somewhere else. Once again, everyone must develop critical thinking in order to be able to check for bias when evaluating all AI responses.

### *Ethical Uses of AI*

There are many different ethical aspects regarding the use of AI. Everything from how an AI-controlled car responds to certain situations to when it is appropriate to use AI should be considered. In considering the latter, academia must continually evaluate the use of AI in the teaching and learning process to better understand when AI should and shouldn't be used to ensure fairness and equity in the creation of the best educational experience for everyone involved (Stahl & Eke, 2024).

We must consider that although there is now free access to AI, those with financial means can access even better more capable AIs. This needs to be taken into consideration if requiring students to access AI as part of an assignment/assessment. In a similar light, faculty, students, and staff need to be specifically trained on when it is appropriate/allowable to use AI with regard to

school work to avoid academic misconduct in alignment with the educational institutions' policies (Anders, 2024). This carries over to the allowed use of AI in the workplace in order to ensure data safety and adherence to company processes and guidelines.

## *Environmental/Physical Effects of AI*

Another important aspect to contemplate is the environmental impact and the physical effects that AI is having and will have within the general environment on mankind itself. AI currently uses a huge amount of electricity and water (for cooling), which can be very harmful for the environment if clean fuel sources are not used and proper steps are not taken (Calvert, 2024).

Both Google and Microsoft (major user and financial backer of OpenAI) claim to be carbon neutral, but only through the purchasing of carbon credits (Kerr, 2024). However, the major AI companies are looking to address this energy issue directly, "From Amazon to Google, companies at the forefront of the AI boom are investing in nuclear energy to fuel data centers — which provide the infrastructure and resources needed to train and run AI models" (Varanasi, 2024, para. 2). The specific companies listed in the news article were Amazon, Google, Microsoft, and OpenAI.

We must also consider that AI is now working to also help address many different aspects of improving the environment. An article by the World Economic Forum titled "9 ways AI is helping tackle climate change" highlighted how AI is being used in everything from weather forecasting to reforestation and waste management (and much more) to help with environmental issues (Masterson, 2024).

There are also aspects to consider regarding physical and mental health. Many people already struggle with issues associated with computer/internet (technology) addiction, adding AI will make this an even greater issue (Eliot, 2024; Marais & Jacobsen, 2024). There are also worries about unregulated use for self-care, unhealthy romantic AI relationships, social isolation, and lack of physical activity due to overuse of AI (SW, 2024).

Yet at the same time, generative AI is being used more and more to help people's mental health in many different ways. Properly trained and implemented AI is now being offered that can specifically help people with their mood, help them overcome depression, address social skills, anxiety, and much more (Olawade et al., 2024). Additionally, there is a growing demand for this type of assistance in that "There's a critical shortage of human therapists and a growing number of potential patients. AI driven chatbots are

designed to help fill that gap by giving therapists a new tool” (LaPook, 2024, para. 1).

### Overreliance

The term “overreliance” was highlighted as extremely important and defined by OpenAI in their *GPT 4 Technical Report* (Achiam et al., 2023). They expressed that,

Overreliance occurs when users excessively trust and depend on the model, potentially leading to unnoticed mistakes and inadequate oversight. This can happen in various ways: users may not be vigilant for errors due to trust in the model; they may fail to provide appropriate oversight based on the use case and context; or they may utilize the model in domains where they lack expertise, making it difficult to identify mistakes. As users become more comfortable with the system, dependency on the model may hinder the development of new skills or even lead to the loss of important skills. Overreliance is a failure mode that likely increases with model capability and reach.

(pp. 59–60)

Overreliance is especially important in academia given the final part of the quote expressing that overreliance on AI can cause people to have problems in developing new skills and could also result in losing current skills. Teachers and instructors at all levels must realize that and ensure that foundational knowledge in all needed subjects is fully developed and that students are held accountable for their learning both with AI and without.

To help address issues of overreliance with AI in academia I have come up with the following key steps:

1. **Teach AI Literacy:** Students must gain a firm foundational understanding of the AI literacy components in order to use AI appropriately and avoid overreliance.
2. **Ensure the Teaching of Ethics and Critical Thinking:** Although already a key aspect of AI literacy, this component needs to be directly highlighted and repeatedly developed to help students address this issue.
3. **Foster the Development of Critical Awareness:** Students need to be able to recognize and be aware of, when they are relying and over-relying on an AI system. They need to be able to properly reflect on and make

informed decisions on whether or not this reliance and possible loss of skills (if an outdated skill) is OK or not. This must be purposefully done.

4. **Review Dangers and Consequences of Overreliance:** Use video, images, and real case studies to create an emotional connection to the dangers and ramifications that can occur from overreliance on an AI system.
5. **Hold Students Accountable for their Learning:** Use many different types of assessments to ensure students entirely incorporate concepts and are fully learning both with the use of AI as well as without the help of AI.
6. **Foster a Growth Mindset:** Students need to know that struggling to figure some things out is part of the learning process. AI can be used as a helpful tool to assist with examples and explanations, but it should not always be used to immediately answer all questions when trying to learn.
7. **Highlight Who Will Be Most Successful in the Future:** Express that those who will be able to excel the most with AI are those who can understand concepts and integrate subject matter information within their knowledge and internal schemas.

As you can see, there are many issues and aspects to these issues, which is why critical thinking is so important. These issues face faculty and students, as well as everyone else, so it is important they are contemplated and brought up in the classroom as well.

AI literacy is an imperative that all people must continually develop in order to succeed in our current AI-infused world and in the future that is quickly approaching.

## Summary

Now that you have gained a much deeper understanding of generative AI in general (as covered in [Chapter 1](#)) and AI literacy specifically (Awareness, Capability, Knowledge, Critical Thinking), you are ready to fully harness its power in the process of teaching and learning. The rest of this book will focus on the many different ways that you can use AI as a personal instructional designer to help you with all aspects of the educational process. The next chapter will provide an overview on what instructional design is and why it is so important in teaching and learning.

# Instructional Design Introduction

# 3

## Important Statement Dealing with Instructional Design

Please note that those who work as instructional designers are an extremely valuable resource that you should access and use whenever you can. This book is not meant to replace the important work that those individuals do. The reality is that there simply aren't enough instructional designers to be able to help all the faculty that need their assistance. At one big university I worked at, there were over 1000 faculty and only two instructional designers. At another university I worked at, there were almost 400 faculty with zero instructional designers. Additionally, we have to think about availability. Many instructors will work on their courses or address instructional issues after hours and on weekends when most instructional designers cannot be reached. The purpose of this book is to learn how to use artificial intelligence (AI) as a tool to assist with instructional design whenever you need it to enhance the teaching and learning experience for everyone.

## Defining Instructional Design

Instructional design is the conglomeration of theory and practice with regard to teaching and learning. The key is to think about students' learning needs and how to best help the students to successfully learn. Instructional design experts, Michael Molenda, Charles Reigelueth, and Laurie Nelson, from

DOI: [10.4324/9781003568544-3](https://doi.org/10.4324/9781003568544-3)

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Indiana University skillfully encapsulate and define instructional design by expressing,

Instructional design is a construct that refers to the principles and procedures by which instructional materials, lessons, and whole systems can be developed in a consistent and reliable fashion. The principles and procedures can be applied to guide designers to work more efficiently while producing more effective and appealing instruction suitable for a wide range of learning environments

(Molenda et al., 1983, p. 574)

This definition, even though it is from 1983, still holds true in that although we will be using advanced AI as a tool to assist us with instructional design, we are still seeking to “work more efficiently while producing more effective and appealing instruction suitable for a wide range of learning environments.” To use AI to its utmost in our teaching and learning endeavor, it will greatly help for us to know different aspects of good instructional design.

## ADDIE

The ADDIE model is an effective process for instructional design that has been around since the 1970s (Branson et al., 1975). This cyclical process has five distinct stages, which make up the ADDIE acronym (Analysis, Design, Development, Implementation, Evaluation), to help ensure efficient and logical course creation, organization, and completion (Peterson, 2003).

### *Stage 1: A: Analysis*

A *Needs Analysis* is conducted within this stage in order to understand what students already know about the content to be learned (to gain an understanding of the intended audience), as well as what specifically needs to be learned in order to accomplish the task or develop the needed skill (understanding). This can sometimes be as easy as reviewing the already provided course curriculum to ensure proper nesting of course goals, but sometimes this may require a review of specific job/field tasks and/or organizational requirements, in order to understand what skills, capabilities, or understandings students need to obtain. If this is truly a new field/subject and/or course,

it may necessitate physically observing the job or process to be taught as well as interviewing those within that area. Employer surveys and interviews can add additional valuable insights to this analysis phase.

### *Stage 2: D: Design*

This second stage deals with planning, requiring the identification of learning outcomes/objectives, what evidence will be used to determine that those objectives have been met (assessment), and what activities (pedagogical approaches) will be used in the teaching and learning process. Information from the analysis phase is used to make design decisions in this phase. This is also where considerations are made on instructional material to include, such as media and technological tools, to create the most impactful learning experience. Note that this section correlates well with the key aspects already described within Course Alignment. Additionally, note that after each stage within the ADDIE model, an evaluation should be made as to that component's progress; continued evaluation throughout is a key aspect of the success of this model in instructional design.

### *Stage 3: D: Development*

This stage deals with production and uses the information gained from the previous two stages (analysis and design). Now, you, as the instructional designer, actually develop and/or select different materials and media needed for instruction and directly evaluate this content for suitability and effectiveness. This can include prototyping or full development of an instructional component or course. Both the instructional materials/media and the overall ADDIE process are evaluated at this stage to ensure proper effectiveness and applicability. Remember that all parts of ADDIE should have an evaluation aspect to ensure proper coherence and movement to the end goal of course creation (or course modification).

### *Stage 4: I: Implementation*

Within this stage, the course or course modification is actually implemented and delivered. Depending on the circumstances, a pilot course could be conducted, or the full new course or change could be executed. A key aspect

of the implementation phase is to review this application and evaluate all aspects of its process and results in order to make any necessary modifications. This can be a quick process that can be done during implementation if needed. The key is purposeful observation and evaluation, which can be accomplished via your own thoughts/critiques, students' thoughts obtained via discussion, survey, or other means, and/or an outside reviewer's observations (can even include formal end-of-course evaluations). Ongoing redesign and modification are natural and expected when implementing a new course or modifications to an existing course.

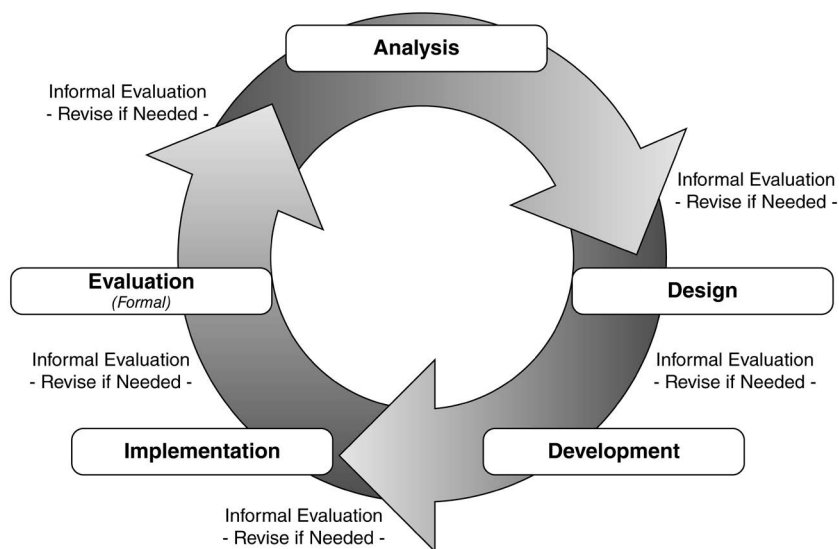
### *Phase 5: E: Evaluation*

This phase is an extremely important aspect of ADDIE and is different from the ongoing evaluations done after each phase. This evaluation is directly conducted at the end of the overall process to assist with quality assurance and to identify any issues that need to be adjusted and improved. It is of vital importance during this evaluation process is to ensure that student learning outcomes (SLOs) are being fully met.

Note the circular process of the ADDIE process and the importance of both informal and formal evaluation. Although the ADDIE process typically starts with Stage 1: Analysis, faculty can use ADDIE however they need to best address their current challenges and needs.

Another instructional design technique that is popular with some is AGILE. Although this was initially created for software development, it is believed to be a fast-moving process that consists of A: Align, G: Get set, I: Iterate and implement, L: Leverage, and E: Evaluate (Neibert, 2013). By taking a step back, one sees that it is simply another implementation of the ADDIE process with a focus on quick prototyping and an emphasis on communication with those involved (focus on the stakeholders over the processes). ADDIE itself starts with a focus on the stakeholders (the students) and can be implemented in this way as well since you, as the user of the method, are free to implement and modify as needed to best suit your specific use case (Figure 3.1).

I recommend ADDIE because it is the most trusted method overall, is easy to remember, and can yield great results if followed. Remember that a key aspect of the ADDIE model is to continually evaluate your course to identify issues, developments, or new technology or system processes that necessitate improvements/modifications to the course to stay current, relevant, and effective.



**Figure 3.1** ADDIE model for instructional design.

## Course Alignment

Course alignment (referred to as “constructive alignment” by John Biggs) is generally considered as being developed by Ralph Tyler and then refined by Biggs (2014), expresses the need for three main aspects of a course (student learning objective/outcomes: SLO, instructional strategies, and assessment strategies) to be properly aligned or in support of one another (Biggs, 1996). This is eloquently expressed by Biggs himself when stating,

“Constructive alignment” represents a marriage of the two thrusts, constructivism being used as a framework to guide decision-making at all stages in instructional design: in deriving curriculum objectives in terms of performances that represent a suitably high cognitive level, in deciding teaching/learning activities judged to elicit those performances, and to assess and summatively report student performance. The “performances of understanding” nominated in the objectives are thus used to systematically align the teaching methods and the assessment.

(Biggs, 1996, p. 347)

Using more simplistic language, course alignment is a process to ensure that appropriate SLOs are decided upon first in order to then choose assessments

that would provide evidence that this outcome was achieved, to then decide on the instructional strategies (teaching activities: pedagogies) that would best help the student learn the material and pass the assessments chosen. An implied aspect of this is that the teaching activities are in alignment with the assessments, meaning that they need to be correlated. As an example, if I am teaching students presentation skills but only lecture to my students, I can't expect them to do well on a physical presentation oral exam, since I only prepared them to do well on a written test. In this example, I would need to do more hands-on learning and *formative assessment* (lower stakes/points assessment to help develop students and provide feedback) in order to better prepare them for a full presentation that they would be assessed on for their *summative assessment* (higher stakes assessment that more fully evaluates what they learned and can accomplish).

Course alignment is important because it improves standardization, which then leads to increased reliable and fairer assessments, allows students to more easily focus on stated learning goals, improves the ability to conduct course, module, and teaching evaluations, and enhances congruence with nested curriculum program and organizational objectives. Course alignment is also considered an important best practice within academia (Blumberg, 2009).

This aspect of instructional design will be explained more fully, to include how AI can greatly help with its development, in a dedicated chapter on Course Alignment (Chapter 4). For now, it is just important to become familiar with the concept and realize the importance of having learning objectives/outcomes, teaching/learning activities, and assessments all in support of or in alignment with one another.

## Backward Design

This needed aspect of instructional design was introduced by curriculum experts Grant Wiggins and Jay McTighe, and is described as “One starts with the end – the desired results (goals or standards) – and then derives the curriculum from the evidence of learning (performances) called for by the standard and the teaching needed to equip students to perform” (Wiggins & McTighe, 1998, p. 1):

1. Desired results (student learning objectives/outcomes)
2. Evidence of learning (assessments needed)
3. Teaching needed (teaching and learning activities)

This generally implies that we as educators need to focus on what students need (student-centered) to learn as the starting point to properly plan the needed educational components (evidence: meaning assessments and the learning plan: teaching/learning activities) (Wiggins & McTighe, 2005).

Backward design is a needed component to help ensure course alignment. This type of planning design helps to improve efficiencies and effectiveness by helping faculty focus on what needs to be instructed and how it needs to be done to ensure achievement of the end educational goals.

## Bloom's Revised Taxonomy

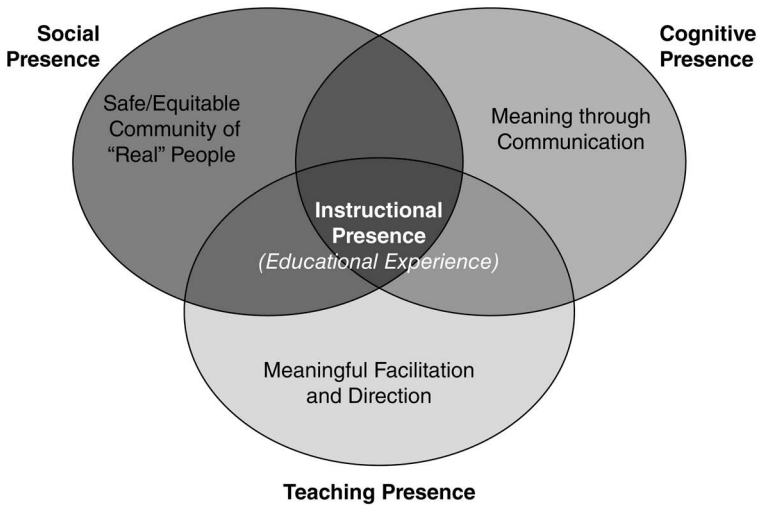
Bloom's Revised Taxonomy provides a framework for educational objectives (such as SLOs) dealing within students' cognitive domain (knowledge and mental capability) (Krathwohl, & Anderson, 2001). This taxonomy affords six different levels, which are generally expressed as moving from simple to more complex capabilities: (1) remember (examples: recognize, identify, recall, and retrieve), (2) understand (example: interpret, exemplify, classify, summarize, explain), (3) apply (example: execute, implement), (4) analyze (example: differentiate, organize, attribute), (5) evaluate (example: check, critique), and (6) create (generate, plan, produce).

An instructor would evaluate the knowledge to be learned by the students, categorize it within a knowledge dimension (factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge), and then, based on the needed level of learning (skills mastery), decide on the appropriate level within Bloom's Revised Taxonomy. Once that is understood and decided upon, SLOs/objectives can be created (Figure 3.2).

This taxonomy, its use, and how generative AI can be used to help with the process of creating SLOs will be more fully expressed in the Student Learning Outcomes chapter (Chapter 5).

## Kolb's Experiential Learning Cycle

The Experiential Learning theory is "a holistic integrative perspective on learning that combines experiences, perception, cognition, and behavior" and has intellectual origins from the influential works of Dewey, Lewin, and Piaget (Kolb, 1984, p. 21). Experiential learning focuses on a continuing process as opposed to outcomes and centers on the idea that thoughts and



**Figure 3.2** Bloom's revised taxonomy.

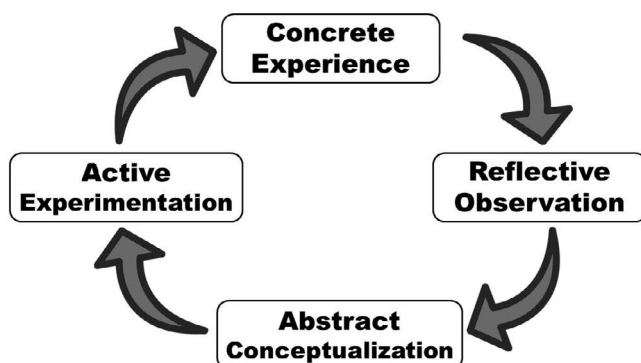
therefore learning “are formed and re-formed through experience,” which causes an adaption within our thinking (p. 26).

Kolb goes even further and provides us with a specific definition of learning, “Learning is the process whereby knowledge is created through the transformation of experience” (Kolb, 1984, p. 38). He states that this definition is meant to emphasize the process of learning through adaption as opposed to just content or outcomes, that acquiring knowledge is an ongoing transformational process through creation and recreation (not something that is simply transmitted), and that learning is a transformational objective and subjective experience.

The specific components of the Experiential Learning Cycle begin with a Concrete Experience, then a Reflective Observation occurs, which turns into Abstract Conceptualization, followed by Active Experimentation, and finally, the cycle repeats.

### *Concrete Experience*

This is when a student is fully involved (focused) in a new or surprising experience. Great examples of this would be field trips, hands-on activities, a demonstration, role play, simulations, an internship, and other experiential exercises. A key factor here is that students are engaged/focused and actively



**Figure 3.3** Kolb's experiential learning cycle.

experiencing, not simply just going through the motions of a class (instructional) session. Increased realism or engagement, using as many senses as appropriate, can really aid and enhance the experience, but care must be taken to ensure that students don't slip into *cognitive overload* and become overwhelmed (Figure 3.3).

### *Reflective Observation*

Students need to take the time to purposefully reflect on the experience and contemplate it through multiple perspectives. This is an important step for a number of reasons, including better understanding, improved memory of the situation, and development of critical thinking. Kolb gives additional importance to this part of the learning cycle when citing another prominent learning scientist, "The great educator Paulo Freire (1992) stressed the importance of naming one's own experience in dialogue with others, emphasizing praxis, the transformative dialectic between reflection and action" (Kolb & Kolb, 2018, p. 11).

### *Abstract Conceptualization*

At this stage, students think about their observations and analyze different ideas to create theories for possible plans of actions (how the newly learned information could be used in different ways). Students in this stage use critical thinking as well as problem-solving techniques to ensure enhanced comprehension of the experienced phenomenon.

## Active Experimentation

Now, students use and test out created theories and plans to see if they can effectively accomplish tasks and solve problems. This testing and subsequent solutions then serve as useful guides for new concrete experiences, which then starts the experiential learning cycle once again.

By going through this process of learning (not just a circle but a spiral of consecutive iterations), students obtain input/information through the concrete experience event which they then transform through reflection and conceptualization and then transform what was learned again by active experimentation, thereby starting the cycle once again.

Kolb explains the importance of this ongoing experiential learning process (spiral) to help ensure an enhanced educational experience, to faculty by stating,

Organise your course or curriculum as a series of learning cycles to form a deepening spiral of learning that expands in complexity and application. The learning modes are revisited, and students' understanding is developed further each time. They discover more about the practical limits and the wider applications of their new knowledge by taking what they have learned in one situation and using it in another.

(Kolb & Kolb, 2018, p. 9)

A full explanation of how generative AI can be used to help address the experiential learning cycle will be fully expressed within the Instructional Strategies ([Chapter 7](#)). The purpose of presenting this information is to give you a greater general understanding of the theoretical base for how learning can best occur within students.

## Motivation

Another important element in good instructional design is in the consideration and implementation of educational motivation. Educational motivation deals with the sustained arousal, persistent interest, and actions of students toward the desired behavior of learning. This is best captured and illustrated within noted educational psychologist, John Keller's ARCS Model of Motivation which organizes educational motivation into the four key concepts of Attention, Relevancy, Confidence, and Satisfaction (Keller, 1987). This motivational model as well as how generative AI can be used to maximize each component's effectiveness in teaching and learning will be fully explained within the Motivation chapter ([Chapter 8](#)) of this book.

The importance of motivation in education is highlighted by Dale H. Schunk, professor in the School of Education at the University of North Carolina, at Greensboro, in often cited book, *Learning Theories: An Educational Perspective*, stating “Cognitive theories emphasize that motivation can help to direct attention and influence how information is processed” and “Teachers need to consider the motivational effects of instructional practices and classroom factors to ensure that students remain motivated to learn” (Schunk, 2012, p. 23).

### Instructional Presence

An often overlooked area of instructional design deals with instructional presence, which can be described as “... the ability of a teacher [instructor] to make a student feel like a real learning member of an instructional community and not ‘just a number,’ that is not simply an unknown student just going through the motions of taking the class,” and it also implies that the “... instructor is also a real human person that students want to listen to, can approach, and interact with” (Anders, 2017, p. 8). The overall concept of instructional presence is derived from education researchers Randy Garrison, Terry Anderson, and Walter Archer’s development of their Community of Inquiry Model composed of Social Presence, Cognitive Presence, and Teaching Presence (Garrison et al., 1999).

These three overlapping components of the Community of Inquiry Model equal the overall concept of instructional presence, an important aspect of instructional design. Generative AI can be harnessed for each one of these components to help ensure improvements in this area. Greater details and examples of implementation will be provided within the Instructional Presence chapter (Chapter 9) of this book (Figure 3.4).

### Additional Guidance

I would also like to share with you the four key things that I personally focus on whenever I teach any course. This is coming from someone that has been teaching at the university, in the military, and in business sectors for over twenty years.

1. **Make Learning Active and Hands-On:** People, in general, prefer hands-on and engaging learning as opposed to passively sitting there just hearing a lecture. Much research shows that people learn better when the

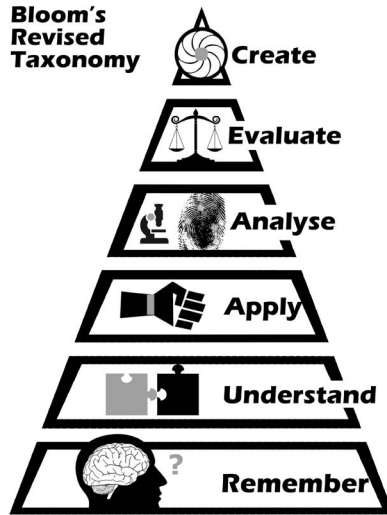


Figure 3.4 Instructional presence.

learning experience is more active (Aguilar & Calabrese, 2025; Freeman et al., 2014; Göller et al., 2017).

2. **Create a Safe, Friendly, and Communal Environment:** Be approachable and show your real human side to people so they are less anxious. Explicitly state that there will be civil interaction/debate in the class and always work to ensure that no one is made to feel unimportant. Use appropriate humor and smile.
3. **Motivate and Inspire:** Actively be thinking about how you can show the importance and relevancy of what you are teaching. Additionally, be genuinely enthusiastic about the content, it spreads to the students as well.
4. **Be Their Role-Model:** Ensure that you are using good verbal and non-verbal communication techniques so that they can see what right looks like. Along with that, use active listening and be as clear as possible so that students will do the same.

## Summary

By going through this chapter, you have gained a greater understanding of key aspects of instructional design to create enhanced educational experiences. You have learned about the definition of Instructional Design, the utility of the ADDIE model, the need for Course Alignment, the value of

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Backward Design, the illumination of Kolbe's Experiential Learning Cycle, the power of educational Motivation, the importance of Instructional Presence, and the assistive nature of Bloom's Revised Taxonomy.

Now that you have a good amount of foundational knowledge, we can build upon it and see how generative AI can be used in many different ways to help with each aspect of instructional design.

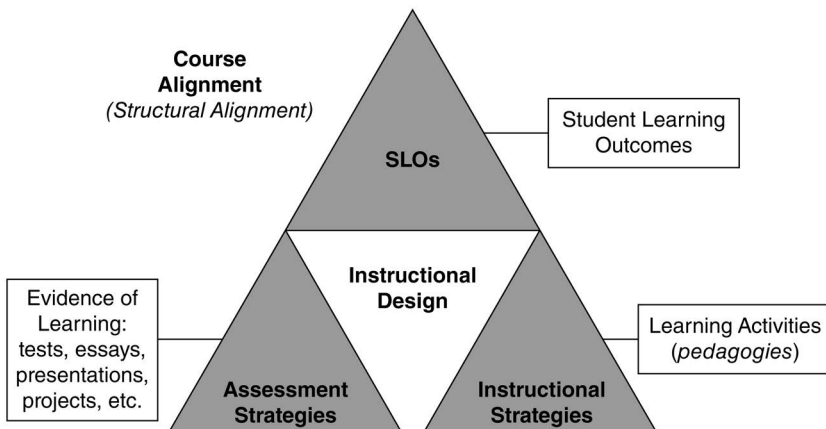
# Course Alignment

# 4

## Key Parts of Course Alignments

In [Chapter 3](#), we defined course alignment as a process to ensure that appropriate student learning outcomes (SLOs) are decided upon first in order to then decide on assessments that would provide evidence that this outcome was achieved, to then decide on the learning activities (pedagogies) that would best help the student learn the material and pass the assessments chosen ([Figure 4.1](#)).

With this understanding, we have the foundational aspects of instructional design, but the key to overall course/structural alignment is the word “alignment.” The idea that assessment strategies are to be focused on providing evidence of learning of the SLOs and that the instructional strategies (learning activities) need to be done in a way that fully supports the assessment



**Figure 4.1** Course alignment.

DOI: [10.4324/9781003568544-4](https://doi.org/10.4324/9781003568544-4)

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strategies can sometimes be difficult for some faculty to fully comprehend. This is important to understand to improve organizational aspects of a given course, to aid in time management and focus, and to ensure students better understand the content, are prepared for their assessments, and stay properly motivated.

## Alignment of Key Parts of the Course

Here is a simple example to help illustrate this point of good course “alignment.” I’m teaching a course on Professional Communication, and here is one primary SLO along with the assessment and teaching activities. Let’s look at these three components:

**SLO:** You will be required to create and present an oral presentation effectively using verbal and non-verbal communication techniques to a diverse audience, with the use of media/ technology, and answer questions from the audience without the aid of additional technology.

**Assessment:** You will give a 10-minute presentation to the class that will include a digital slideshow followed by a Q&A where you will answer questions without being assisted by technology.

**Instructional Strategies, Teaching Activities (Pedagogies):** Short (15-minute) lectures will be used followed by hands-on learning practical exercises to practice aspects of verbal and non-verbal communication along with getting up in front of the class and presenting and answering questions. I will model what good oral presentations and what good slideshows are. We will use Project-Based Learning (PBL) in preparation for their final assignment.

We see that the SLO requires students to be able to “create and present” a presentation with the use of technology and then answer questions without technological help. So that is the end goal that students must be able to accomplish, but how are we going to evaluate them? What evidence are we going to require to ensure that this SLO has been accomplished?

Our assessment states that students will actually “give a 10 minute presentation to the class.” They will have to create and demonstrate their effectiveness by using a digital slideshow and then answering questions without the assistance of technology. This seems like a logical way for students to prove that they have achieved the learning outcome. In addition to us recognizing and ensuring this alignment, we can also ask the artificial intelligence (AI) to verify our understanding at this point.

## AI Activity

Note that following suggestions on how to use AI to assist you with instructional design are orientated toward the use of text input with the AI. This focus was selected to make it easier to see all aspects of what is being explained. You can, however, use voice commands, screen readers, or upload your own files to an AI to accomplish the same things being described via text prompting.

Go to your preferred AI (Example ChatGPT, Google's AI, Grok, Claude, etc.) and, using our advanced prompt formula learned in a previous chapter, type in the following **prompt**:

Please assume the role of a professional instructional designer. I am teaching a university course on Professional Communication. One of my main Student Learning Outcomes (SLO) is: You will be required to create and present an oral presentation effectively using verbal and non-verbal communication techniques to a diverse audience, with the use of media/technology and answer questions from the audience without the aid of additional technology. My Assessment for this is: Students will give a 10 minutes presentation to the class that will include a digital slideshow followed by a Q&A where you will answer questions without being assisted by technology. Please review this SLO and Assessment and ensure that it properly aligns. I want to make sure that the assessment effectively provides evidence of students' learning and attainment of the SLO. Let me know if you need any additional information to give me the best result possible.

Review the AI response and notice the way it provides you with extensive information. For an even broader experience, use two or three different AI systems to see and compare the differences in the AI responses.

Generally, the AI will respond by saying that this SLO and assessment are good and are aligned, but there is room for improvement. Remember that these AI systems are meant to be conversational, so they will always try and give you some sort of recommendation. In testing this prompt with ChatGPT, Google AI, and Claude, it usually wants to put in more clarification within the SLO and assessment and to include a rubric for the assessment. We have to remember that we want the SLO and assessment to have some detail but not too much detail. We want to allow for flexibility of implementation. We will provide much more specific details within the actual assessment instructions and within the rubric (this will be described within the forthcoming chapters as well).

In order to help you see the real value here, let's modify this good example so that it is *not* properly aligned. Here is a bad example:

**SLO:** You will be required to create and present an oral presentation effectively using verbal and non-verbal communication techniques to a diverse audience, with the use of media/technology and answer questions from the audience without the aid of additional technology. (*same as before*)

**Assessment:** Students will identify key components of a good oral presentation by taking a 50-question multiple choice written test (*different assessment*)

Notice here that in our bad example, our new assessment is using a typical written multiple choice test. So now we have to look and ask ourselves, “does this assessment and its evidence of learning properly give us an indication that our students really learned and accomplished the SLO?” Let's see what the AI has to say.

### *AI Activity*

Once again, go to your preferred AI (Example ChatGPT, Google's AI, Microsoft's AI, Claude, etc.). Make sure that you start a new chat session (just to make sure that there is no confusion with any previous prompts) and type in the following **prompt**:

Please assume the role of a professional instructional designer. I am teaching a university course on Professional Communication. One of my main Student Learning Outcomes (SLO) is: You will be required to create and present an oral presentation effectively using verbal and non-verbal communication techniques to a diverse audience, with the use of media/technology and answer questions from the audience without the aid of additional technology. My Assessment for this is: You will identify key components of a good oral presentation by taking a 50 question multiple choice written test. Please review this SLO and Assessment and ensure that it properly aligns. I want to make sure that the assessment effectively provides evidence of students' learning, attainment of the SLO. Let me know if you need any additional information to give me the best result possible.

Now, you should notice that the AI will recognize that this change has caused the assessment of the SLO to not be properly aligned. ChatGPT responded by saying, “Misalignment Observed,” and Google’s AI stated that it was only “Partially Aligned.” Claude AI stated it nicely by expressing “I notice some significant misalignment between your SLO and assessment method.”

The reason that we do not have proper alignment here is that although a 50-question multiple choice test might be a good indicator of obtained understanding, it is not a good assessment to indicate that students can “create and present” an effective oral presentation both with and without the use of media and technology.

Asking the AI if our assessment is properly aligned with our SLO will verify this for us. It serves as an excellent assistive tool and second opinion. The AIs, in this case, give some great suggestions to help modify our assessment so that it is more like our initial good example to accurately indicate that full learning has occurred.

But what about the learning activities? We need all course components to be properly aligned to maximize learning and pass the required assessment that will provide evidence of obtaining the SLO.

The purpose of the learning activities is to help the students understand the content and to adequately prepare them to successfully pass the assessment. My assessment, in the good example, is to have them actually give a presentation to our diverse class that will include a digital slideshow and be followed by a Q&A session (without technology). We now need to ensure that our chosen pedagogy is used effectively to help students get ready for that assessment.

**Instructional Strategies, Teaching Activities (Pedagogies):** Short (15-minute) lectures will be used followed by hands-on learning practical exercises to practice aspects of verbal and non-verbal communication along with getting up in front of the class and presenting and answering questions. I will model what good oral presentations and what good slideshows are. We will use PBL in preparation for their final assignment.

Notice how these Instructional Activities are hands-on, meaning that students actually go through and do things that match what they will later do in their summative assessment. We go through and do formative assessments, low-stakes practice to help develop students’ capabilities and give them feedback so that they can improve and succeed in the summative assessment, real evaluation for higher points. The instructor will also be demonstrating and modeling what right looks like through effective verbal/non-verbal

communication and proper development and use of digital slideshows. This presents the information in a logical way, increasing students' understanding, and lowering their frustration, which aids in motivation.

### *AI Activity*

Let us now take all of our course components (from our good example), feed it into the AI, and see what it says regarding proper course alignment. Start a new AI session, like last time, and use the following **prompt**:

Please assume the role of a professional instructional designer. I am teaching a university course on Professional Communication. One of my main Student Learning Outcomes (SLO) is: You will be required to create and present an oral presentation effectively using verbal and non-verbal communication techniques to a diverse audience, with the use of media/technology and answer questions from the audience without the aid of additional technology. My Assessment for this is: Students will give a 10 minutes presentation to the class that will include a digital slideshow followed by a Q&A where you will answer questions without being assisted by technology. For Learning Activities, I will conduct short (15 minute) lectures followed by hands-on learning practical exercises to practice aspects of verbal and non-verbal communication along with getting up in front of the class and presenting and answers questions. I will model what good oral presentations and what good slideshows are. We will use Project Based Learning (PBL) in preparation for their final assignment.

Please review this SLO, Assessment, and Learning Activities to ensure that it is all properly aligned. I want to make sure that the assessment effectively provides evidence of students' learning, attainment of the SLO, and that the Learning Activities helps them learn and prepares them for the assessment. Let me know if you need any additional information to give me the best result possible.

The results of this prompt, when used with ChatGPT, stated, "Your course design shows strong alignment between the SLO, assessment, and learning activities," which is exactly what we want to hear.

This result from the AI, acknowledging that our course was in proper alignment, was what we expected to see because we have already learned

what good course alignment looks like. Because we have this foundational knowledge in instructional design, we can now use AI as an enhancement tool to help us improve our teaching and learning. We are still the human in the loop, but we are able to accomplish more (and faster) because we know what right looks like and we know how to properly use the AI tool.

Now we can view and understand this infographic and see the two key areas where AI can greatly assist us in helping to ensure proper course alignment. First, we can ensure alignment between the SLO and the assessment strategies and then between all three course components (SLO, assessment strategies, and instructional strategies). We do this by using the provided prompts, created with our advanced prompt formula to get the best results overall (Figure 4.2).

This overall process would then be repeated for additional SLOs. We want to make sure the assessments and instructional/learning activities are all properly lined up for all learning goals within the course for all of the SLOs. This has the additional benefit of helping faculty avoid spending unnecessary class time and resources on instructional content that is outside the scope of the agreed-upon and identified SLOs. Faculty can now focus on the key content important to the course.

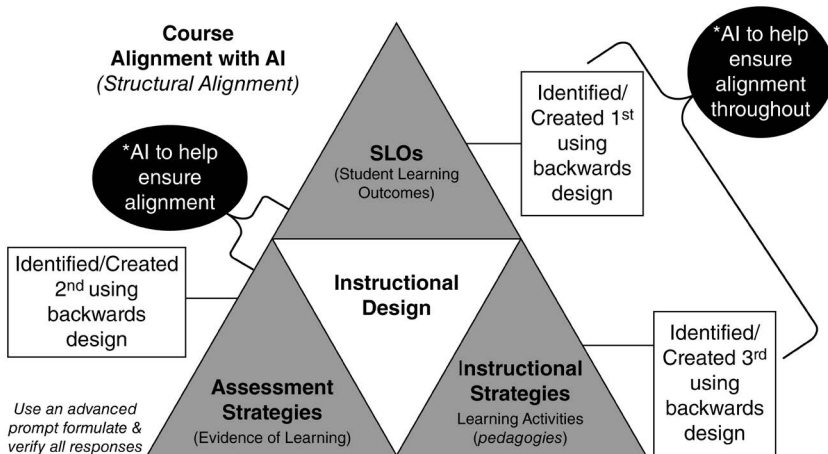


Figure 4.2 Course alignment with AI.

## Summary

In this chapter, we went over the key aspects of course alignment (SLOs, assessment, and instructional strategies) and developed a greater understanding of why this alignment is vital to students' comprehension, development, and even motivation. We used AI to verify different aspects of our alignment as an assistive tool and second opinion.

To continue to better understand the course alignment process, and see how generative AI can be used for each of these course components individually, subsequent chapters will address each part of course alignment: SLO creation, assessment strategies development, and instructional strategies/teaching activities formulation.

# Student Learning Outcomes

# 5

## Learning Domains

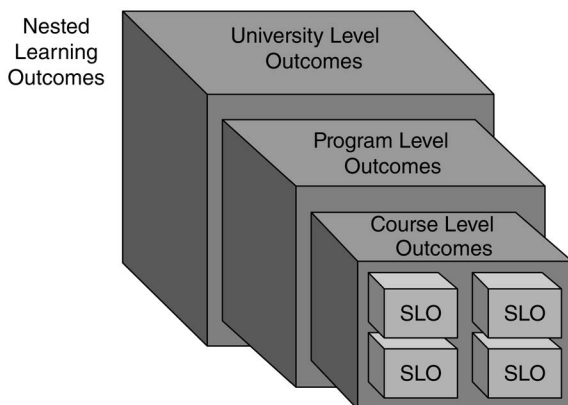
The process of learning is most often viewed and categorized within three separate domains: cognitive, affective, and psychomotor (Bloom & Krathwohl, 1956; Hoque, 2016). Note, however, that it is actually impossible to completely separate these different domains from one another in that you need cognition to have an attitude and to decide to physically act. Each one of these domains have multiple levels of learning which move from a lower level (surface-level type learning) to a more advanced (deeper-level type learning). I will focus on the cognitive aspect of learning here in that this domain is the one that is mostly focused upon in academic settings, but I will provide more information on the other two domains of affective and psychomotor at the end of this chapter, because they too are very important in different ways.

## Nesting

Learning outcomes are important to ensure logical structuring of the course and to focus instruction toward the goals. Some faculty can get distracted or are unsure about how much of a subject to cover, having these specific learning outcomes helps to address these issues to focus the teaching to best address the SLO. Faculty must know that SLOs are the required outcomes that must be focused on in that these SLOs are nested within other layers within the educational institution. As an example, student learning outcomes (SLOs) are nested within Course Outcomes, which are nested within Program Outcomes, that are all nested within university level Outcomes.

DOI: [10.4324/9781003568544-5](https://doi.org/10.4324/9781003568544-5)

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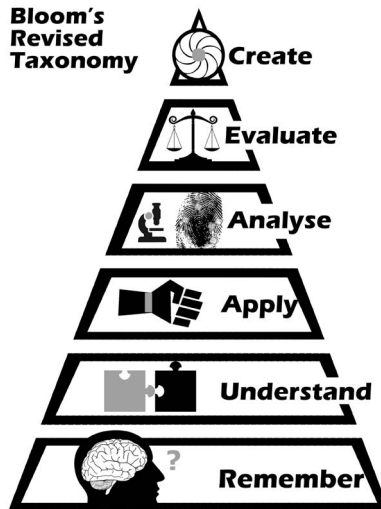


**Figure 5.1** Nested learning outcomes.

## SLO Development

Yet this then raises the question of how does one come up with appropriate student learning outcomes (SLOs)? SLOs will typically be given to an instructor so that its goals will be appropriately nested within that of the program, degree/specialty, and university (or other educational institution). Some courses, however, will be new and require full development of learning outcomes (Figure 5.1). In following the instructional design process of ADDIE (as described in Chapter 3), we would have conducted an A: Analysis of the subject/field or aspect of the job to be learned to then be ready to move to the next phase D: Development of our SLOs. Let us continue with our previous example to best illustrate this:

I'm teaching a university course dealing with Professional Communication. This course is taught as part of a degree in English and Communication. In reviewing the field and ensuring proper nesting, I have identified key skills needed by students. They need to know how to create a good written report and to be able to effectively give an oral presentation. To effectively give a good oral presentation students need to know and use proper verbal and non-verbal communication skills. They need to be able to efficiently use technology such as slideshow creation software and other technology and media. Students also need to be able to communicate to a diverse audience without the use of technology (able to talk and answer questions on the spot, on their own).



**Figure 5.2** Bloom's revised taxonomy.

As briefly introduced in [Chapter 3](#), Bloom's Revised Taxonomy provides an easy-to-understand framework for us to develop our educational outcomes (SLOs) dealing with the cognitive domain (their knowledge and mental processing capability) (Krathwohl & Anderson, 2001). This taxonomy was originally created by Benjamin S. Bloom and colleagues (Bloom & Krathwohl, 1956) and then later refined (Figure 5.2). The current cognitive taxonomy has six different levels, generally explained as advancing from simple to more complex capabilities: (1) Remember (recognize, identify, recall, and retrieve), (2) Understand (interpret, exemplify, classify, summarize, explain), (3) Apply (execute, implement), (4) Analyze (differentiate, organize, attribute), (5) Evaluate (check, critique), and (6) Create (generate, plan, produce).

As the instructor for the course (and possibly with the help of a program chair or other advisor), you would evaluate what the students are to learn (remembering the need for nesting with the overall program) and then categorize this needed learning within a knowledge dimension (factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge, see [Figure 5.3](#)) (Krathwohl, 2002). This is done one at a time for each learning component. Next, based on the needed level of learning/comprehension (based on things like prior exposure or prerequisites, age/grade level, and/or skills mastery needs), you would choose the appropriate stage

The Knowledge Dimension	The Cognitive Dimension (Bloom's Revised Taxonomy)					
	Remember	Understand	Apply	Analyze	Evaluate	Create
<b>Factual Knowledge</b> understanding terms & details						
<b>Conceptual Knowledge</b> inter-relationships of structures						
<b>Procedural Knowledge</b> how to do something, procedures						
<b>Meta-Cognitive Knowledge</b> awareness & appropriate context						

Figure 5.3 Bloom's knowledge dimension.

within Bloom's Revised Taxonomy. Here is a spreadsheet to help with this process:

In reviewing my example analysis, I can see that in wanting my students to be able to *effectively give a good oral presentation* with the use of technology, I see that this lies both within Apply and Create in Bloom's Revised Taxonomy (I will go with and use the "Create" taxonomy since it is a higher order). I understand this through the purposeful identification of appropriate *action verbs* for the identified skill. Arizona State University's Office of Evaluation and Educational Effectiveness' website offers a great list of action verbs that effectively correlate with each category of Bloom's Revised Taxonomy (ASUOE, n.d.). Below is a small example:

**Action Verbs**

1. **Remember:** identify, list, match, recall, recognize
2. **Understand:** classify, discuss, exemplify, explain, interpret, summarize
3. **Apply:** calculate, demonstrate, employ, execute, implement
4. **Analyze:** attribute, differentiate, deconstruct, organize, integrate

5. **Evaluate:** assess, check, critique, judge, rank, validate
6. **Create:** design, formulate, generate, plan, produce, write

Note that this is not an exhaustive list and that there can be some overlap. Clarification would be given to students via the evaluation’s specific instructions.

Having identified its placement within the cognitive domain (within Bloom’s Revised Taxonomy) I would then delineate its placement within the Knowledge Dimension. I would place this learning skill within both the Procedural Knowledge and Metacognition Knowledge sections (see Figure 5.4 example). This process then helps me understand what skills/subskills I need to focus on so that my students can fully learn the educational material and concepts.

AI can be a great assistant with this process in that we can ask it to help us decide the appropriate placement of the learning within the cognitive and knowledge dimensions.







The Knowledge Dimension	The Cognitive Dimension <i>(Bloom's Revised Taxonomy)</i>					
	 Remember	 Understand	 Apply	 Analyze	 Evaluate	 Create
<b>Factual Knowledge</b> understanding terms & details						
<b>Conceptual Knowledge</b> inter-relationships of structures						
<b>Procedural Knowledge</b> how to do something, procedures			Effectively giving an oral presentation	Effectively giving an oral presentation		Effectively giving an oral presentation
<b>Meta-Cognitive Knowledge</b> awareness & appropriate context			Effectively giving an oral presentation	Effectively giving an oral presentation		Effectively giving an oral presentation

Figure 5.4 Bloom’s knowledge dimension example.

## *AI Activity*

Go to your preferred AI, start a new chat session, and pose the following **prompt**:

Please act as a professional instructional designer at a university. I'm teaching a university course dealing with Professional Communication. This course is taught as part of a degree in English and Communication. In reviewing the field and ensuring proper nesting, I have identified key skills needed by students. One of them is that they need to know how to effectively give an oral presentation. To effectively give a good presentation students need to know and use proper verbal and non-verbal communication skills. They need to be able to efficiently use technology such as slideshow creation software and other technology and media. Yet, students also need to be able to communicate to a diverse audience without the use of technology (able to talk and answer questions on the spot, on their own). I have access to many different resources (technology, guest speakers, etc.). I am using backward planning and need this information to develop a student learning outcome. These are Junior and Senior students who are native speakers. Assist me in deciding the most appropriate placement of this learning requirement within both Bloom's Revised Taxonomy (the cognitive dimension) and within the Knowledge dimension as explained by Krathwohl (2002). Do you need any other information to give me the best answer possible?

The AI may want to ask you for additional information. If this seems pertinent, then add info; otherwise, simply read on or ask it to answer with the given information (the provided prompt has all the needed info for a good response).

In testing the provided prompt with ChatGPT, it expressed that the placement of "effectively giving an oral presentation" in Bloom's Revised Taxonomy would be Creating (to include Applying and Analyzing) and that placement within the knowledge dimension would be both procedural knowledge and metacognitive knowledge (for awareness of communication strategies). This provides a useful second opinion that can either verify my initial thoughts or give me a different opinion, allowing me to look into it further.

Once I am satisfied and understand what I, as the instructor, need to focus on with the learning outcomes, I can move forward and create the actual SLO. I simply use an appropriate action verb and write out what the student will be required to "do," accomplish.

Some key guidelines (Kennedy, 2006) in writing good SLOs are:

1. Use simple clear terms that will be easily understood by students, other faculty, and reviewers.
2. Have only one main verb per SLO. Yes, my example has “create” and “present,” but they easily go together in this situation.
3. A course should generally have between four and eight total SLOs.
4. Ensure that the SLO is measurable (more specifics will be given in the assignment/assessment’s instructions and in the rubric).
5. I also recommend to write SLOs in the second person to make it more direct and personable to the student (the primary audience of the SLO).

### *Example SLO Write-Up*

You will be required to create and present an oral presentation effectively using verbal and non-verbal communication techniques to a diverse audience, with the use of media/technology and answer questions from the audience without the aid of additional technology.

### AI Activity

Now that we have a firm understanding and agreement regarding placement within Bloom’s revised taxonomy and the knowledge dimension, we can ask the AI to create the SLO for us (in this case it would be a continuation of the previous conversation with the AI so we would NOT start a new chat session). Pose the following **prompt**:

Please create a clear student learning outcome to best address the learning outcomes discussed. Write it in the second person to be more personable towards the student.

Here is the exact result given by the AI (ChatGPT):

By the end of this course, you will be able to design and deliver professional oral presentations by:

1. Applying verbal and non-verbal communication strategies to engage diverse audiences.

2. Utilizing slideshow creation software and media to enhance your presentation effectiveness.
3. Adapting your delivery to communicate effectively without technology, including responding to audience questions spontaneously.

Notice the similarities between what I wrote and what the AI was able to create for me. We must remember the importance of AI literacy and always review an AI's response. Additionally, we are able to effectively review this response because we have first built up our own knowledge and understanding of instructional design. Used differently, I could have written the SLO myself and then fed it into the AI and ask for feedback on it. Remember that there are many ways that you can use the AI to your advantage. You decide how much help you want the AI to provide.

## Other Types of Learning Domains (Affective/Physical)

A question that might arise deals with a difference between cognitive learning tasks (as expressed in the previous example) and more affective (attitudinal) or physical learning tasks.

### *Affective Learning Domain*

As opposed to the Cognitive domain (which is the usual focus in higher education and lower levels), the Affective domain isn't focused on knowledge (mental processing/computation) but instead deals with attitudes. This means things like feelings, emotions, values, and even habits and willingness, as well as aspects of motivation (Bloom & Krathwohl, 1956; Hoque, 2016; Nelson et al., 2020). Another informative way to describe this is, "In the cognitive domain we are concerned that the student shall be able to do the task when requested. In the affective domain we are more concerned that he does do it when it is appropriate after he has learned he can do it" (Krathwohl et al., 1964, p. 60).

As instructors, we should take a step back and realize the importance of this. If we want students to fully appreciate the content being learned and be able to apply their skills outside of the classroom, then we need to ensure that their affective domains are being incorporated into our educational goals.

The Affective domain is expressed via five different categorizations/levels (Krathwohl et al., 1964):

1. **Receiving:** This is the lowest level or initial categorization and deals with an individual's resistance or willingness to receive and accept the instruction or information being taught (basic awareness). **Action Verbs:** *ask, explain, identify, listen, recognize, respond.*
2. **Responding:** This denotes someone's active (seeking/perusing) participation, showing interest, and willingness to participate (even expressing joy in the process). **Action Verbs:** *assist, cooperate, demonstrate, discuss, examine, respond.*
3. **Valuing:** This is expressed through accepting and internalizing the value of what is being learned. An appreciation and/or concern for the subject matter. **Action Verbs:** *defends, demonstrates, follows, invites, justifies, shares.*
4. **Organization:** This deals with prioritization of different values and balancing different responsibilities by changing behaviors. This is highlighted by adaptability to different situations and value systems. **Action Verbs:** *formulates, initiates, organizes, prioritizes, relates, synthesizes.*
5. **Characterization:** This is the highest level or final categorization and refers to a pervasive, consistent, and predictable internalized value system that directs students' behavior. The student displays self-reliance and has a greater capability to work individually with a strong commitment (more internally motivated). **Action Verbs:** *decides, influences, proposes, questions, solves, verifies.*

## AI Activity

Now that we better understand this aspect of the affective domain, we can go to the AI and pose a slightly different **prompt**:

Please act as a professional instructional designer at a university. I'm teaching a university course dealing with Professional Communication. This course is taught as part of a degree in English and Communication. In reviewing the field and ensuring proper nesting, I have identified key skills needed by students. One of them is that they need to know how to effectively give an oral presentation. To effectively give a good presentation students need to know and use proper verbal and non-verbal communication skills. They need to be able to efficiently use technology such as slideshow creation software and other technology and media. Yet, students also need to be able to communicate to a

diverse audience without the use of technology (able to talk and answer questions on the spot, on their own). Additionally, students need to develop an appropriate internal appreciation for this content so that they can apply this skill outside of the classroom at appropriate times to succeed. I have access to many different resources (technology, guest speakers, etc.). I am using backward planning and need this information to develop a student learning outcome. These are Junior and Senior students who are native speakers. Assist me in using Blooms's revised taxonomy and affective domain, help me write a good Student learning outcome. Do you need any other information to give me the best answer possible? Please write this out in the second person to make it more direct to the student and format it so that it is a short paragraph.

Notice at the end that we added specific aspects of the affective domain. The results of this prompt (in this case tested with ChatGPT) show that it is now also incorporating some of the affective domain considerations:

By the end of this course, you will be able to plan and deliver an engaging oral presentation that effectively incorporates verbal and non-verbal communication skills. You will demonstrate proficiency in utilizing technology, such as slideshow software, to enhance your message while also showcasing your ability to adapt and communicate effectively without technological aids, responding thoughtfully to audience questions. Additionally, you will cultivate an internal appreciation for the value of these skills, enabling you to apply them confidently in diverse real-world settings beyond the classroom.

The fact that the affective domain is more of an internal state makes it more difficult to fully observe and evaluate. Some suggestions to accomplish this include attitudinal surveys, self-observations (such as through journaling), other observations (done by you or student peers), role-playing (where students make a decision based on their attitudes/values), and reflective activities (Cassady, 2002; Olatunji, 2014).

### *Psychomotor Learning Domain*

The third and final learning domain deals with physical movement (psychomotor/kinesthetic). Bloom, Krathwohl, and others in their group made reference to this important learning domain but never fully addressed it or created

a taxonomy for it. Other researchers have created different psychomotor learning domain taxonomies such as the 5-level Dave taxonomy describing progressive stages of Imitation, Manipulation, Precision, Articulation, and Naturalization (Dave, 1970). But I will share with you a newer psychomotor learning domain taxonomy, the Learn, See, Practice, Prove, Do, and Maintain Framework, that I think more closely resembles the learning process for physical learning tasks (Sawyer et al., 2015).

Although originally developed by researchers and practitioners in the medical field, this psychomotor learning domain taxonomy can greatly assist faculty in any genre to best create and organize SLOs. It follows a logical order of progression and even incorporates aspects of development and simulation in order to best achieve the final level of accomplishment. Here are its levels presented in order:

1. **Learn:** This recognizes the necessity of a preemptive cognitive contribution and deals with the students learning via reading and other simple images (low-fidelity photos/videos).
2. **See:** Although still an aspect of the cognitive domain, the student sees a demonstration of the physical task to be learned in high fidelity maximizing both verbal and non-verbal cues. This is generally done both at full speed to see and realize the task in actuality and at different, slower speeds so as deconstruct the actions needed with usable commentary to provide further explanation and understanding.
3. **Practice:** This truly psychomotor phase requires the student to deliberately go through the process, as observed, to help to develop the skill being taught. This could involve the use of simulators (like virtual/augmented reality). Providing learners with actionable feedback on this formative practice is key at this stage so that students can properly learn and develop.
4. **Prove:** The main difference in this stage is that a student (after having ample opportunity to practice) would be more formally assessed for skills mastery. This skills master is focused purely on the physical components of the skill to be learned and could be evaluated via a virtual/reality or other simulation system.
5. **Do:** This is an even higher level of proficiency and involves actually applying and conducting the learned skill in a real environment or situation. A medical example would be to prove skills mastery, such as to conduct an operation, via a virtual reality simulator and now having to prove skills mastery by performing the operation on a real patient. A different example could be assembling an electrical circuit on a breadboard done first via a simulator and now done live in front of an instructor.

6. **Maintain:** This aspect of the psychomotor learning domain deals with preventing the loss of capability (of what was learned). This is well expressed by Sawyer’s group when stating, “The term ‘de-skilling’ has been applied to the gradual loss of skills through infrequent practice. In novice providers, this de-skilling will likely occur rapidly. In experienced providers, de-skilling may occur more slowly” (p. 5). In an educational setting, this is often done through multiple tests of a skill, either within the same class or through the degree process, or via ongoing life-long learning, professional development, or re-credentialing requirements.

Since it is a process of developing a student’s physical capabilities, an instructor would create student learning objectives on the level of development that they seek to achieve within the course.

## AI Activity

As an example of using AI to assist with this process, let’s start a new chat with your preferred AI and use the following **prompt**:

Please assume the role of an instructional designer. I am teaching a university course dealing with traditional American folk dancing. Students will need to be able to actually dance and display their skills with the traditional American Square Dance. How could I best write a student learning outcome for this using the Learn, See, Practice, Prove, Do, and Maintain Framework (Sawyer et al., 2015) for the psychomotor learning domain? I want to create a good student learning outcome, written in the second person, to best guide my students.

The AI (Grok in this case) responded with a long and very detailed SLO:

### Student Learning Outcome

**Learn:** You will understand the historical and cultural significance of traditional American Square Dance, including its origins, evolution, and regional variations.

**See:** You will observe demonstrations of key Square Dance moves and formations by instructors or expert dancers to visually learn the steps, patterns, and timing.

**Practice:** You will engage in regular practice sessions where you replicate the movements, focusing on coordination, rhythm, and partner interaction.

This includes practicing basic calls, turns, and set formations until they become second nature.

**Prove:** You will demonstrate your competency in executing a set sequence of Square Dance moves during mid-term evaluations. This will involve performing under observation where you'll be assessed on accuracy, timing, and style.

**Do:** You will participate in a class performance or at a local community event, where you will dance live with others, adapting to various dance calls in real time, showcasing your ability to apply learned skills in an authentic setting.

**Maintain:** Beyond the course, you will engage in activities designed to keep your skills sharp, such as joining local dance groups, attending workshops, or participating in dance festivals. You'll also reflect on your learning by documenting your progress in a dance journal or through peer feedback sessions.

**Full SLO Statement in Second Person:** You will learn about the cultural context of American Square Dance, observe and analyze expert demonstrations, practice these dances through guided sessions, prove your mastery in structured assessments, perform in real-life settings, and maintain your skills through continued participation and reflection. By the end of this course, you will be able to confidently participate in and lead traditional Square Dances with precision, understanding, and cultural appreciation.

As always, this is an ongoing conversation, so I can ask the AI to make its response shorter for me. Or, I can simply select the parts that I want to use. I like a portion of the last part titled "Full SLO Statement in Second Person." So, I would just use that:

**SLO:** You will learn about the cultural context of American Square Dance, observe and analyze expert demonstrations, practice these dances through guided sessions, prove your mastery in structured assessments, and perform in real-life settings.

## Summary

As demonstrated, AI can be used in a multiple of ways with SLOs. AI can help us to identify where an SLO falls within Bloom's taxonomy, its placement within the knowledge dimension, incorporations of affective and psychomotor domains, and the writing of actual SLOs. The importance of understanding

these different learning domains while working on creating the SLO is that by understanding how they all overlap and intertwine, we as educators improve our ability to define our goal and create an enhanced educational experience for everyone involved. Now that we have gained a firm understanding of SLOs, we can move on to the second step in the instructional design course alignment process, deciding on what evidence (assessment) will be needed to verify that learning occurred, achievement of the SLO.

# Assessment

# 6

## Importance and Assessment's Role

Biggs (popular research figure behind course alignment) expressed the importance and role that assessments play for students by citing a fellow learning scientist researcher and then adding important commentary,

As Ramsden (1992) puts it, the assessment is the curriculum, as far as the students are concerned. They will learn what they think they will be assessed on, not what is in the curriculum, or even on what has been 'covered' in class. The trick is, then, to make sure the assessment tasks mirror the DLOs [Desired Learning Outcomes].

(2003, p. 3)

How many of us have had students directly ask "will this be on the test?" That is a clear example of students being focused on assessment and not understanding or valuing the other important aspects of good overall learning. It is important to be explicit with students and explain why each part is being learned: aspects of foundational knowledge, and how in order to learn something more complex, one first needs to understand some of the building blocks, or one needs to know other aspects besides the final goal in order to achieve better results. This all needs to be clearly and directly explained. Biggs goes on to describe the importance of alignment within assessment for student success by saying,

To the teacher, assessment is at the end of the teaching-learning sequence of events, but to the student it is at the beginning. If the curriculum is reflected in the assessment, ...the teaching activities of the teacher and the learner activities of the learner are both directed

DOI: [10.4324/9781003568544-6](https://doi.org/10.4324/9781003568544-6)

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towards the same goal. In preparing for the assessments, students will be learning the curriculum.

(2003, pp. 3–4)

## Types of Assessment

Within academia, there are typically four types of assessments, two of which are much more often used in academia (formative and summative) and two of which are used less but are still helpful to know and possibly use (diagnostic and ipsative). In reviewing these descriptions and examples be sure to also note that an assessment in itself can also serve as a learning activity (Evans et al., 2014; Moore, 2010).

### *Formative Assessments*

The first type of assessment is formative assessment and is a developmental evaluation. As the name implies, this is meant to help “form” the student and is typically done with low stakes (low points or no points) such as just participation points to help with students’ growth. I like to think of it as the student’s understanding is like a piece of clay and we are helping to form (formative) their understanding through this type of assessment. Formative assessments directly help students prepare for the final summative assessment by providing an opportunity for practice and providing feedback so that students can understand their current level of proficiency and know what to do to improve (Zhang & Henderson, 2015).

Formative assessment should generally be similar to or have an aspect of how the summative assessment that will be conducted. As an example, if the summative assessment would be a written exam, then some formative assessments should have written components similar to the final summative assessment, such as shorter quizzes. Briggs also recommends that formative assessments should focus on components of knowledge needed to help fully develop the student to then put it all together for a summative assessment (Biggs, 2014). As an example, if I am preparing students to give a big oral presentation to the class, I could observe them giving a presentation to two or three students in small groups and focus on just verbal communication during one observation and just non-verbal communication during another observation. Giving them feedback on each portion would much better prepare and develop them as a formative assessment process. Also remember

that obtaining this type of assessment data should be used to drive your instruction (what to review, reexplain, and/or focus on).

## Examples of Formative Assessments

**Questions in Class:** There are many ways to ask students questions in class, but the act of interacting with students and having them physically raise their hands and physically answer is important for hands-on, student-centered learning, engagement, and motivation. Asking questions not only holds students accountable for paying attention, staying focused, and learning but also helps to develop their understanding and lets you see their level of understanding.

Use different types of question types for maximum effect such as closed questions (yes/no, one specific answer), open questions (multiple possible answers), opinion questions (what did you like most and why), evaluation questions (how would you rate this business leader's performance, why), problem-solving questions, and more. Be sure to generally use the ask, pause, call technique by first asking a question, pausing for the appropriate amount of time (to let students process), and then calling on someone to answer. This is beneficial so that all participate, have time to think, and know that they can be called upon to answer (actively work to get everyone involved).

**Think Pair Share:** Students are presented with a question/problem and are then asked to *think* about the solution or their opinions (usually, for about a minute or two). Then, they are asked to *pair* up with another student to discuss each other's solutions/ideas (again usually for a minute or two). Finally, they are called upon to *share* their ideas or what they came up with for the solution.

**Classroom Polls:** A great formative assessment that has everyone participating at once is through the use of a classroom poll. This can be done at any time and simply involves asking a question to the entire class and having them respond. They can respond to some questions by simply raising their hands (yes/no, true/false), or cellphones/tablets/laptops could be used with an online poll system (example: [www.mentimeter.com](http://www.mentimeter.com)) to get results for more complicated questions (multiple choice, fill in the blank, short answer). This is also a great way to start a discussion or introduce a topic.

**Quizzes:** This can be done in a variety of ways and in different formats. You could simply ask them to take out a sheet of paper and write down answers to your questions. You could create a worksheet for them to

fill out via pen/pencil. You can now also create online quizzes and have them do it in class via their cellphone (Google forms is great for this: <https://docs.google.com/forms>). Be sure to give students feedback in some way as to what was correct and why other answers were wrong.

**Exit/Admission Tickets:** Using exit and/or admission tickets is an easy and quick way to formatively assess a student's understanding of a previous or current instructional session. Exit tickets are generally short summaries that a student writes on what was learned during class (handed to the instructor as they leave). An admission ticket is something that a student either writes as soon as they come in or is written ahead of time on what was learned in the previous class, and is handed to you, as the instructor, as the student gets to class. These are short assessments that you will be able to read through in a matter of minutes that can help you clear up issues/misunderstandings or help you focus on certain topics. It also helps the students reflect on what they learned.

**Journals:** You can have students keep a special notebook that they bring to class specifically for journaling about class activities and topics. Students can either free-write about what they want (regarding the class) or you can pose specific things for them to concentrate on as they write out their issues and learning journey. Students can write in class or out, with you periodically picking up and reviewing what they've written and even replying back to their questions and other entries. Participation points are usually a great low stakes way to help ensure maximum participation.

**One-Minute Papers:** This useful formative assessment can be used in different ways. It can be used to ask students to answer questions regarding a specific part of the topic being learned, about the main point of the lesson, to write out a question they may have, to express what was interesting, confusing, missing, surprising, etc. It is labeled as *one minute* to encourage students to quickly and directly express themselves, but you can manipulate the time given.

**Observations:** Creating any type of practical exercise, such as a scenario where students need to role-play, act out, demonstrate, and/or apply what they have learned, can offer students a great opportunity to practice and for you to observe their understanding. This can be a very valuable formative assessment if students are allowed to watch other students and if constructive feedback provided.

Note that these formative assessments are just a sample of the many different ones that are available and can be modified as needed for online or hybrid implementation. The use of formative assessments should be done to help

students better understand the material, see their progress, offer an opportunity for feedback (which should be given as quickly as possible, providing actionable ways to improve and areas of strength), as well as to help guide you, as the instructor, regarding how to possibly adjust your teaching focus. Additionally, remember that for proper internal alignment, a majority of formative assessments (low stakes) should be done in a manner to help prepare students for the higher stakes (higher points) summative assessment.

## AI Activity

Now that we have developed our understanding of instructional design with regard to formative assessments, we can use artificial intelligence (AI) as an assistive tool.

Let's use the example of a high school math instructor who is teaching students about the Pythagorean theorem. For the final test for this module (summative assessment), she will be giving the students a word problem that will require them to not only solve by using the Pythagorean theorem but also draw out a representation of their answer.

Go to your preferred AI, start a new chat session, and pose the following **prompt**:

Please assume the role of an instructional designer and a high school math instructor teaching the Pythagorean theorem. The final test for this module will have a word problem that will require students to not only solve by using the Pythagorean theorem but also draw out a representation of their answer. Give me three options for impactful formative assessment that I can give my students to best prepare them for the final summative assessment. Do you need any additional information to give me the best answer?

The results of this prompt yielded three great formative assessment possibilities. The best part is that you can always simply tell the AI "Give me three more possibilities." Below is the second result that the AI provided. I want to share this example because it presents a novel formative assessment that was not previously expressed.

### Collaborative Triangle Challenges

**Activity:** Students work in pairs to create their own word problems involving right triangles.

**Step 1:** Each pair writes a unique word problem, ensuring it requires the Pythagorean theorem to solve.

**Step 2:** They solve their own problem and create a labeled drawing.

**Step 3:** Pairs swap problems, solve their peers' challenges, and critique the accuracy of the drawings.

**Rationale:** By creating and solving problems, students deepen their conceptual understanding and practice identifying critical components for visual representation.

This interesting formative assessment option, offered by the AI, will allow students to develop some social learning experience by working with a partner and using creativity to develop their own word problem that incorporates the Pythagorean theorem. The additional step of swapping what they have created with another group, solving their created word problem, and then offering a critique of the problem and illustration is also very impactful. This is an example of peer-to-peer interaction and peer critiques that have been shown to be a great way to learn (Stigmar, 2016; Tullis & Goldstone, 2020).

My recommendations in using this type of formative assessment would be to ensure clear instructions on the process to ensure that students are properly guided (examples: proper time management, civil engagement with constructive critiques, friendly/safe environment, use of a possible worksheet to best guide them). This is to help students focus on the key purpose(s) of the activity. An AI could again be used to help you develop these types of instructions. Use the provided advanced prompt formula to ask the AI to help you with this.

## *Summative Assessments*

This is a culmination type of evaluation that is done after formative assessments have been provided. Summative assessments are done at the end of an instructional unit or at the end of a course. Multiple summative assessments, as opposed to just one final summative assessment, are highly recommended to improve student understanding and help minimize academic misconduct (Lang, 2013; Trotter, 2006). These summative assessments are meant to provide an evaluation and evidence as to what the student has learned/accomplished with regards to the SLO (student learning outcome).

A key component of the summative assessment is that it evaluates students in an appropriate way at an appropriate level. The appropriate level was previously identified and chosen when formulating the SLO (this was done using

Bloom's Revised Taxonomy). Now we need to ensure that the summative assessment type will be of an appropriate form.

Let's look once again at our example of the SLO and assessment from [Chapter 4](#) to see the importance of an appropriate and aligned assessment:

**SLO:** You will be required to create and present an oral presentation effectively using verbal and non-verbal communication techniques to a diverse audience, with the use of media/technology and answer questions from the audience without the aid of additional technology.

**Assessment:** You will give a 10-minute presentation to the class that will include a digital slideshow followed by a Q&A where you will answer questions without being assisted by technology.

The assessment here is appropriate and aligned in that assessment evidence will be that students will be able to actually go through and give a presentation to the class using media and then answering questions. The aligns with the SLO requirement of students being able to “create and present an oral presentation” using technology and then being able to answer questions without technology. The assignment would not be properly aligned if, for example, I chose a different form of evidence such as students passing a multiple choice test or writing an essay about giving a presentation. That would not properly give evidence that students could actually conduct an oral presentation. To further illustrate this, let's test this out through the use of an AI.

## AI Activity

Go to your preferred AI, start a new chat session, and pose the following **prompt**:

Please assume the role of a professional instructional designer. I am teaching a university course on Professional Communication. One of my main Student Learning Outcomes (SLO) is: You will be required to create and present an oral presentation effectively using verbal and non-verbal communication techniques to a diverse audience, with the use of media/technology and answer questions from the audience without the aid of additional technology. My Assessment for this is: Students will write a 1000 word essay on how to properly conduct an oral presentation. Please review this SLO and Assessment and ensure that it properly aligns. I want to make sure that the assessment effectively

provides evidence of students' learning and attainment of the SLO. Let me know if you need any additional information to give me the best result possible.

In an effort to use different AIs and expose you, the reader, to many different tools, I chose to use LeChat AI (<https://mistral.ai>) made by a French company, Mistral. This AI's response was:

The assessment is a written essay, which primarily measures theoretical knowledge and writing skills rather than practical presentation skills. The essay does not provide an opportunity for students to demonstrate their oral presentation skills, use of technology, or ability to handle audience questions in real-time. The essay may provide evidence of students' understanding of the theory behind effective oral presentations but does not provide direct evidence of their ability to apply this knowledge in a practical setting.

After the AI identified the misalignment and inappropriateness of the assessment, it went on to give recommendations such as having students actually give a live presentation either in class or via a video connection. It also gave additional recommendations such as having both peer and instructor feedback and possibly having the students write a reflective essay after their actual presentation. These are all useful ideas for you to contemplate and possibly incorporate.

## Examples of Summative Assessments

A summative assessment can take on many different forms. The key aspect with a summative assessment is that it is for higher stakes (more points), is a culmination of the previous formative assessment to help prepare the student, and provides full evidence for SLO attainment. The following is a partial listing of summative assessments:

**Tests:** These are structured assessments (done by hand or digitally) which evaluate students' understanding of specific knowledge or skills through the use of multiple choice, true/false, short answers, or other types of question. An exam like this is usually done under a specific time limit. This is usually done in class under monitored conditions but can be administered however you, as the instructor, desires.

**Essay:** This type of assessment requires that students express their understanding, analysis, reflection, and/or argument on a given topic using an established format for writing. Generally, specifics such as word count, formatting, needed references, allotted time, and more are given to students as criteria.

**Performance:** With a performance assessment, students actively demonstrate capabilities, knowledge, and skills via presentations and demonstrations. The key aspect of a performance is that students are evaluated on their ability to actively apply what they have learned (examples: oral presentations, music recital, dance, dissection, putting a specific combination of chemicals together in the right order).

**Projects:** Done individually or in a group (project-based learning), this type of assessment requires students to research information, apply their knowledge, and use their skills to solve a problem or create a product of some kind. This is generally done over an extended period of time and can be used to develop and evaluate teamwork, creativity, knowledge application, and integration of learning from diverse areas. Examples of projects can include but are not limited to a business proposal, an art project, a historical presentation, a marketing campaign, a video game creation, or an engineered prototyped product.

**Portfolios:** This can be done physically or digitally and is a collection of curated student work done within the class. It provides a showcase of learning accomplished, content/products created, achievements, and progress through the course. This is beneficial in that it can provide a holistic view of the student and often has reflection for each portfolio item. Content within the portfolio could be designated by the instructor or self-selected by the student depending on how the assessment is configured.

## AI Activity

Continuing with the previous example of professional communication, let's use AI to help us create a summative assessment. Go to your preferred AI, start a new chat session, and pose the following **prompt**:

Please assume the role of a professional instructional designer. I am teaching a university course on Professional Communication. One of my main Student Learning Outcomes (SLO) is: You will be required to create and present an oral presentation effectively using verbal and

non-verbal communication techniques to a diverse audience, with the use of media/technology and answer questions from the audience without the aid of additional technology. Help me create a performance based summative assessment that would provide good evidence that this SLO was achieved. Let me know if you need any additional information to give me the best result possible.

The results from the AI provide an aligned assessment with usable details. Remember that you are the subject matter expert and have gained instructional design knowledge so you can properly evaluate the AI suggestions. Here is a summary of the AI's response (tested with ChatGPT) to the prompt:

**Assessment Title:** "Diverse Audience Communication Challenge"

**Overview:** Students will deliver a 5–7-minute oral presentation to a simulated diverse audience on a topic relevant to their field of study or professional interests. The presentation will include the use of media/technology to support their ideas. After the presentation, students will answer 2–3 audience questions without the aid of additional technology to demonstrate their ability to think critically and communicate effectively in real time ...

The AI continued by giving a breakdown of how students would create their presentation as well as other recommendations for you as the instructor in evaluating their performance. Remember that, as always, these are just AI recommendations that you can modify or continue to refine through the AI.

## *Diagnostic Assessments*

This type of assessment would be done before instruction to provide a preliminary understanding of students' strengths, areas to improve, and/or retention of previously required course skills/competencies. This then allows the faculty member to better understand the class's knowledge and abilities. This would then help an instructor adjust focus or modify needed components that need to be covered in order to ensure that students would be able to accomplish the SLOs. Diagnostic assessments also help students understand where they are in terms of needed proficiency in the learning topic.

Diagnostic assessments can be done in multiple ways including written questions, performances (skills tasks), and oral questioning. These diagnostic assessments, sometimes referred to as "pre-test," are often used in math/science to identify knowledge gaps, as well as within language courses to

identify proficiency levels. This is also often done within athletics or physical type training to more fully identify individual and class physical capability within different tasks. The following is an example of how AI can be used to help create a diagnostic assessment.

## AI Activity

Go to your preferred AI, start a new chat session, and pose the following **prompt**:

Please assume the role of an instructional designer and a professor in Kinesiology. I am teaching a first-year kinesiology course focused on flexibility to university students (7 males and 9 females with different physical experiences and capabilities). Help me create a diagnostic test to administer to my students dealing with this topic. Our class is conducted in a yoga studio with mats, and we have one hour and 15 minutes of class time. I want to understand their ability level with this and for them to experience the different movements and gain practical knowledge expressed in this topic. Do you need any other information to give me the best result possible?

The results of this prompt (tested with ChatGPT) provide an outline with specific steps to conduct a simple diagnostic on flexibility capabilities. The following is a summarized version of its response:

**Objective:** Assess students' baseline flexibility across key movement patterns.

Provide students with experiential learning of flexibility techniques and body awareness. Identify areas of improvement for individual students.

**Structure:** Warm-Up (10 minutes): Prepare students for movement.

Assessment Stations (45 minutes): Test specific flexibility measures.

Debrief and Reflection (20 minutes): Facilitate understanding and feedback.

## Step-by-Step Plan

1. Warm-Up (10 minutes) ...

2. Assessment Stations (45 minutes)

Divide students into three groups (five to six students per group). Rotate through the stations below...

Station 1: Forward Flexibility (Hamstrings and Lower Back)...

Station 2: Lateral Flexibility (Trunk and Shoulders)...

Station 3: Hip Flexibility (Hips, Groin, and Lower Back)...

3. Debrief and Reflection (20 minutes)...

Notice that the AI's description of this assessment stated that it would "Provide students with experiential learning of flexibility techniques and body awareness." This important realization that students can actually learn through the assessment process itself is something that we will further discuss in the next chapter focusing on instructional activities. Also, remember that the final part of a good advanced prompt formula is to "Refine." The results provided by an AI do not have to be the end of your interaction with the AI. You can always ask for it to modify its response or provide you with a completely different option.

### *Ipsative Assessments*

These types of assessments are very similar to diagnostic assessments but focus on the individual student's performance/ability as compared to their previous performance/ability. It is meant to showcase a student's personal development and progress over time and is not meant to compare students against an established standard or peers.

Ipsative assessment helps faculty give more personalized feedback and can be more motivating to students because it shows personal growth and specific improvement (Hughes, 2017). This type of information and motivation can greatly help students move forward by providing insight and give students an empowering sense of achievement throughout their ongoing efforts, which has been connected with benefits of a growth mindset (Dweck, 2006; Hughes, 2017). This type of assessment can be easily done in conjunction with formative and summative assessment to directly show students their ongoing progress and achievements.

### **Grading**

An important aspect of assessment deals with how students will be graded. Grading provides a logical, structured way to evaluate students' ability, performance, measure their progress, and help ensure accountability of their learning by communicating feedback to students. Properly structured grading (using a developed standard for judgment) provides usable insights into

students' accomplishments and can provide important motivation for students to continue to improve.

### Key Aspects of Effective Grading (Piontek, 2008; Yale, 2025)

1. **Clarity/Transparency:** The grading process for any and all assessment should be made very clear to students through specific instructions and the use of rubrics (explained later in this chapter). Students need to know how they will be graded so that they can ensure success.
2. **Student Learning Outcome Alignment:** The grading of assignments should work to help develop students' ability to accomplish the SLOs for the course.
3. **Consistency:** The grading of assessments must be consistent and equally applied to all students to ensure fairness for all.
4. **Constructive Feedback:** Although grades are a form of feedback, additional constructive feedback is necessary to help develop students' ability to improve and encourage ongoing development.
5. **Timeliness:** The grading of assessments needs to occur promptly so that students can remember what they have done and learn from their mistakes to improve for next time.

Realize that good grading can sometimes be difficult due to time requirements and possible issues of subjectivity for certain types of assessments. To help address these issues, it is important to schedule assignment turn-in with adequate time for grading and the use of clear instructions along with the use of a good rubric.

### *Rubrics*

A rubric is best described by UCLA Graduate School of Education and Information Studies Professor, James Popham, "... *rubric* refers to a scoring guide used to evaluate the quality of students' constructed responses – for example, their written compositions, oral presentations, or science projects. A rubric has three essential features: evaluative criteria, quality definitions, and a scoring strategy" (Popham, 1997, p. 72).

Within a rubric, the evaluation criteria refer to the components that will make up acceptable responses/actions. These will form categories within the rubric that will either be judged equally or will have different weights for points (evaluation). Quality definitions refer to different tiers of quality that a student will be evaluated on. The scoring strategy for a rubric deals with

how the overall score or rating will be determined (either as an overall score or as separate sectional aspects). This is generally better understood visually.

The following spreadsheet is an example of a rubric using the previously used example of students being summatively assessed on an oral presentation assignment:

<i>Criteria</i>	<i>Exemplary</i>	<i>Proficient</i>	<i>Developing</i>
<b>Content and Structure:</b> Topic is well researched and clearly communicated	Well researched; clear, insightful ideas, and well-articulated	Well researched; clear ideas but lacks depth	Limited research; ideas are unclear or incomplete
Info is logically organized with a strong introduction, body, and conclusion	Exceptionally organized with logical flow	Adequately organized; minor issues with flow	Poor org.; lacks clear structure
<b>Verbal Communication:</b> effective voice modulation and clarity	Voice is dynamic, clear, and engaging	Voice is mostly clear; minor modulation issues	Voice is unclear or monotonous
Appropriate pacing and pronunciation	Excellent pacing and precise pronunciation	Pacing and pronunciation are generally effective	Pacing is erratic; issues with pronunciation
<b>Non-Verbal Communication:</b> confident posture and eye contact	Posture is poised, with consistent eye contact	Posture and eye contact adequate but inconsistent	Posture is poor; eye contact is minimal or absent
Purposeful facial expressions and gestures	Expressions and gestures nicely reinforce message	Underutilization of expressions and gestures	Expressions gestures absent or distracting
<b>Media/Tech Use:</b> Media enhances understanding without dominating the presentation	Media effectively complements the content	Media is used but does not strongly enhance the message	Media is poorly used or distracts from the presentation
Visuals are clear, professional, and appropriately used	Visuals are polished and highly effective	Visuals are functional but lack professionalism	Unclear visuals, unprofessional, or ineffective
<b>Q&amp;A Performance:</b> actively listens and acknowledges questions	Listens attentively; rephrases or confirms understanding	Listens well but could improve	Does not actively listen; misses questions
Provides thoughtful, relevant responses with confidence	Responses are concise, insightful, and confident	Responses are ok but lack depth/ confidence	Responses are inadequate, off-topic, or hesitant

Rubrics are strongly recommended for any assignment where there could be a fair amount of subjectivity involved, such as written or performance assessments. This will help with ensuring consistency, fairness, and will help to lower confusion and anxiety within students.

## AI Activity

AI can now be used to either fully create or draft a rubric for your assignments. Go to your preferred AI, start a new chat session, and pose the following **prompt**:

Please assume the role of an instructional designer. My students (Juniors and Seniors) in a university professional communication course were just visited by a special entrepreneur guest speaker. She gave a great talk on professionalism in the work place and in pitching ideas to potential investors. I am having my students write a reflective essay in the form of a debriefing report on this special event. The purpose of this assessment is to address the student learning outcome of “students will be able to write effective correspondence and reports.” Help me create a draft of a rubric that I could use to best evaluate this assignment. Do you need any other information to give me a highly usable response?

The results of this prompt (tested with Claude AI) first asked for additional information. You can give it more info if you would like, but in this case, I just wanted a draft that I would then further modify myself. Here is a summary of the AI’s results:

<i>Criteria</i>	<i>Distinguished</i>	<i>Proficient</i>	<i>Developing</i>	<i>Beginning</i>
<b>Understanding of Key Messages (40 Points)</b>	Demonstrates thorough understanding of speaker’s messages about professionalism and pitch strategies	Demonstrates clear understanding of most key messages	Shows basic understanding of presentation content	Shows minimal understanding of presentation content
Use of examples	Provides specific, relevant examples from the presentation	Provides some examples from the presentation	Provides few or vague examples	Lacks specific examples

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<i>Criteria</i>	<i>Distinguished</i>	<i>Proficient</i>	<i>Developing</i>	<i>Beginning</i>
Personal reflection	Offers meaningful personal insights and connections to professional goals	Offers personal insights with some depth	Offers surface-level personal insights	Contains minimal personal reflection
Application	Makes thoughtful connections between presentation content and workplace communication	Makes general connections to workplace applications	Makes limited connections to workplace applications	Makes few or no connections to workplace applications
<b>Professional Writing Style (30 Points)</b>				
Tone	Maintains consistent professional tone throughout	Maintains professional tone with minor lapses	Inconsistent professional tone	Inappropriate or informal tone
Language	Uses clear, concise language appropriate for business context	Generally uses clear language	Language occasionally unclear or informal	Unclear or confusing language
Writing conventions	Demonstrates sophisticated vocabulary and varied sentence structure	Shows good control of business writing conventions	Inconsistent use of business writing conventions	Poor understanding of business writing conventions
Grammar and mechanics	Contains no grammatical or mechanical errors	Contains minimal grammatical or mechanical errors	Contains several grammatical or mechanical errors	Contains numerous grammatical or mechanical errors
<b>Organization and Structure (30 Points)</b>				
Flow	Logical, seamless flow of ideas	Clear organization with minor gaps	Some organizational issues	Poor organization
Introduction/ conclusion	Clear, engaging introduction and conclusion	Adequate introduction and conclusion	Weak introduction or conclusion	Missing or ineffective introduction/ conclusion
Paragraphing	Effective paragraph structure with smooth transitions	Generally effective paragraphing	Inconsistent paragraphing	Poor paragraph structure

<i>Criteria</i>	<i>Distinguished</i>	<i>Proficient</i>	<i>Developing</i>	<i>Beginning</i>
Length	Adheres to required length (800 words)	Meets length requirement ( $\pm 50$ words)	Notable deviation from required length	Significantly shorter/longer than required
Formatting	Professional formatting and presentation	Generally professional formatting	Inconsistent formatting	Unprofessional formatting

This AI-created rough draft would be an excellent starting point for me to modify so that it is exactly what I am looking for. This draft is already an 80% solution for me, so it has saved me a lot of time and effort. As always, the key here is that I know what right looks like and what to look for since I have first developed instructional design understanding and skills.

## *Use of AI for Grading*

As AI has become more powerful and capable, there are now possibilities and opportunities for the use of AI for grading. Please note that this requires a special process and has both pros and cons that need to be contemplated and addressed before AI should be used to do any type of student assessment evaluation (Kumar, 2023; Mueller & Chiou, 2025; Owan et al., 2023).

### **Pros**

**Time Savings and Efficiencies:** Using AI for grading can significantly reduce the time needed to evaluate different assignments (this would allow more focus on instructional activities).

**Consistency and Objectivity:** An AI grading system, if used properly, can provide fair and uniform evaluation by consistently applying the same criteria across all assessments without possible human bias or favoritism.

**Immediate Feedback:** AI grading systems can quickly create feedback to give students immediate information on how to improve and areas that were done well. This is a vital component to help students develop and fully learn SLOs.

**Scalability:** A dedicated AI grading systems can be used to efficiently handle large volumes of student assignments. This makes AI a perfect tool for courses that have a large number of students. This helps to ensure that all

students obtain fairly graded assignments with timely feedback, regardless of the size of the class they are in.

### Cons

**Possible Algorithmic Bias:** An AI will need to be properly trained with the right prompt, to include a clear rubric and adequate examples to help ensure that it grades appropriately and isn't being biased based on previously trained data. Considerations should be addressed dealing with different writing styles and cultural differences.

**AI understanding/Comprehension:** Some student writing might be too complex or creatively expressed for the AI to fully understand the nuances made within their argument(s). The depth of AI comprehension of students' works should be evaluated continually to ensure adequate grading.

**Overreliance:** Faculty need to fully develop proper grading capabilities in order to ensure that the AI is properly doing the grading as well. If faculty never gain this skill or lose this skill due to overreliance on an AI, then an important quality assurance process will be missing. This is additionally important in that knowing students' grades and assessment results are important to fully develop teacher-student relations where a teacher deeply knows and understands how their students are developing. This additionally serves as feedback for faculty to possibly modify instructional practices.

**Data Safety/Security:** The collecting and submission of students' data (works and identity info) is an important privacy and data security issue. There are ethical and legal concerns that need to be reviewed. The type of AI used needs to be secure and ensure that submitted information will be protected and will not be used to train future AI models. Special considerations should be given to the handling of possible sensitive assignments such as narrative essays asking students to write about personal events/situations. Check with your educational institution for any policy and or legal requirements.

**Ethical Issues:** Some have debated on whether it is ethically right to use an AI to grade students' work (Akgun & Greenhow, 2022; Kumar, 2023). The question arises, "Is it right to use AI in this way when an instructor tells students not to use AI to accomplish the assignment being evaluated?" These are ethical issues to consider.

The actual grading of assessments by AI can be done in two different ways: via a regular AI or through the use of a dedicated AI grading system.

## *Grading through a Regular AI System*

A regular system would be a commonly accessible AI, such as ChatGPT, Claude or other similar general AI systems. In grading with this type of system, you would open a new chat session, ensure that the essays to grade have been stripped of any sensitive private student data, and enter the following **prompt**:

Please assume the role of an instructor for the university course “Freshman Seminar,” which is a writing course given to freshmen. Use the attached rubric to grade the essay that I will provide you.

The AI will acknowledge receipt of the rubric and ask for the student’s essay.

Here is the student’s essay (attached). In addition to using the rubric for grading, please highlight strengths and any areas for improvement, and then give an overall score with a summary of the strengths and areas to improve, along with actionable ways on how the student can improve their essay.

Review the results to make sure it is in line with your rubric. Ensure that it is understanding your rubric properly and is giving the type of score you would provide. If it is OK, then feed it another student essay using the following **prompt**:

Thank you. Here is another student essay (attached) for you to evaluate and grade using the same rubric that was already provided.

Note that when feeding an essay into an AI to grade, no more than two or three should be done after one another. The AI might drift from the specifics of the initial prompt due to excessive words/tokens used in the current conversation. Evaluate the two or three essays (as per good AI literacy), checking for consistency, then start a new conversation with the AI and enter the prompt again and go through the process.

## *Grading through a Dedicated AI Grading System*

There are many different AI companies that offer dedicated services for grading student assignments (examples include AI Grading Assistant: <https://>

[aigradingassistant.com](https://aigradingassistant.com), CoGrader: <https://cograder.com>, and many more). Although these dedicated systems cost money through different types of subscription plans, they do provide a lot of benefits and can save additional time. One benefit is that once you create your rubric for a given assignment, it would be saved as a special profile for that grading task that could be used every semester/year. You would then be able to batch process multiple essays at the same time (a big time saver over doing them one at a time). Results would then be provided through an easy-to-use interface that could be saved and downloaded in a multiple of ways.

Dedicated AI grading systems offer lots of benefits and flexibility but must be selected and properly managed. Assurances should be made that all data would be kept safe and secure and would not be used to train future AI models. AI grading systems should also be properly evaluated for validity, reliability, and for additional features such as student performance trends and more.

### *AI Grading Doesn't Have to Be an All or Nothing Process*

The use of AI to assist with grading doesn't have to be an all-or-nothing endeavor. AI can be used to help in the grading process by: drafting feedback for different types of issues/areas for students to improve (and how to improve), evaluating parts of a written assignment (example just the mechanics/grammar portion), reviewing overall grades and feedback provided to identify patterns or trends, and even providing a second opinion when doing your own grading.

Using AI for grading can provide many benefits but a thorough review of the pros versus the cons must be taken. Ensure proper permissions are obtained and properly notify all that should be notified, taking care to always properly protect students' information.

### *Academic Misconduct (Cheating)*

There have been some students that have resorted to cheating since as long as records have been kept. To best address the issue, we need to understand what are the key reasons why students cheat and what can be done to help prevent it. The top five reasons why students cheat are:

1. Not Being Fully Prepared/Fear of Failure
2. Not Enough Time to Complete Assignment
3. Not Fully Understanding the Material

4. Believing that Cheating is Acceptable (and the teacher is OK with it)
5. Believing that Others are Cheating (and getting away with it)  
(Awdry & Ives, 2021; Javed, 2019; Lang, 2013; Verhoel & Coester, 2021)

Although AI can make it much easier for students to cheat, it isn't the main cause of cheating in and of itself. The issues identified here can be addressed by ensuring that a course has properly aligned formative assessments that will help students fully understand the material and become fully prepared for summative assessments. Ensure that there are multiple summative assessments as opposed to just one big test at the end in that this makes it harder to learn, more stressful, and has been linked to greater instances of academic dishonesty (Nichols & Berliner, 2007).

Other aspects of the identified reasons why students cheat can be addressed by ensuring a logical progression of learning tasks via well-scheduled classes and assessments. This schedule needs to be explicitly given to the students with periodic reminders to help student stay on task (adequate and timely feedback on all assessment are also important). Additionally, students need to be fully aware of and trained on the policies regarding AI use and, via your instructions, how AI can be used within an assignment (AI use syllabi statements are also recommended). If a student violates these policies/instructions, then follow-through must occur so that students are fully aware that there are consequences for academic misconduct.

## SHARE Technique to Improve Assessment and Assignments

This SHARE technique is an acronym that I created to help everyone in academia to improve both their overall assessments and specific assignments in the age of AI (Anders, 2023b). Each letter in this acronym stands for a specific aspect of what should be done to enhance assessments and assignments now that we have freely available AI.

**S: Strong and More Authentic.** Assignments should have increased rigor and realism in order to properly challenge students, maximize focus along with relevancy, and enhance overall motivation. Assignments should push students to accomplish more now that AI tools are freely available (expect more from them). Additionally, assignments should be made more authentic by making them like what they will be doing in

the workplace. For example, instead of each assignment being an essay, it could be a business proposal, a blog post, a product review, or an event debriefing. Students should be allowed to do some of these assignments with AI and some should be required to be done without AI. Foundational knowledge is important, yet so is the development of AI literacy and AI content creation skills. Incorporate role-play, scenarios, and/or multimedia to increase realism within assessments to create greater emotional connection and interest in actually doing the assignment.

Grounding is another important aspect to make assignments stronger and more authentic. The idea with grounding is that students will make a better connection to the learning content by tying it to specific events that occurred in the class such as: demonstrations, special guests, original case studies, and/or special hands-on activities. Assignments would then be based on what was learned within these events, making it harder for AI to be used, relying more on the students' perceptions and critical/reflective thinking of what occurred and what was learned. This also ties in well with experiential learning.

**H: High Price for False Information.** The idea here is that students would be fully aware that a high amount of points will be deducted from their assignment's grade if the information within it is false or made up. AI can sometimes hallucinate and create made-up information that sounds real or create non-existing references. Having students see the need to double-check and ensure that all of the information within their assignment is correct helps them improve attention to detail, gives them additional exposure to the information, and re-enforces the AI literacy skill of critically evaluating AI responses.

Ensure that students know that there is a high price for false information by specifically stating it in the instructions and within the rubric. To maximize realism and relevancy, I do a quick role-play in my course where I act out a scenario where a worker has put off doing a report for their boss until the last second and then just had an AI do it. The AI created a report but it had several outdated facts/figures and some made-up references. In this role-play scenario, the worker ends up getting fired. I do this to create an emotional connection to the importance of double-checking the specific details of one's assignment. I additionally always have students provide links to all references, even if they are for books or journal articles that they had to physically obtain (I have them provide a library index URL or even an Amazon link). In this way I can quickly check their references to ensure they are real and applicable.

**A: Additional and/or Other Assessment Techniques**

It is important to realize that there are many different types of assessment techniques other than just using an essay. Essays are great, and students learn a lot through the writing process, but in the age of AI, other techniques should be incorporated that additionally teach students other subskills while learning the main content and holding students accountable for learning both with and without the use of AI. Here is a partial list of additional assessment types that should be strongly considered: student presentations (viva voce), Q&As, visual works (student-created videos, posters, and more), student podcasts, in-class writing/quizzes, and group work (via project-based learning).

The idea with these additional assessment techniques (that could be used both for formative and summative assessments) is that it would be holding the students accountable for their learning. If only an essay is assigned and it is done outside of class, then there is no way to be sure that an AI wasn't used to complete the task for them (Fleckenstein et al., 2024). These additional techniques, which could be done in conjunction with an essay (example: write a 5-page essay and then give a 5-minute presentation with a Q&A), better hold students accountable and provide deeper evidence that students have truly achieved the desired SLO.

**R: Reflection/Critical Analysis of Feedback:** The purpose of this aspect of the SHARE technique is to ensure students critically think about their learning and educational experience. The idea here is that student would either write about or verbally express their thoughts on feedback received on a turned-in assignment. This would preferably done in class to help ensure that AI was not used, to help give students direct practice in reflection (contemplation and understanding the what/why of the feedback) and in being able to express themselves. This is again another avenue of holding students accountable for their learning.

**E: Expanded Assignment:** Another option to consider is to expand any current assignment into smaller assignments to help increase visibility of students' understanding, progression/development, and to better ensure that they are only using AI the way that you, as the instructor, want them to use AI.

An example of an expanded assignment would be that instead of assigning an essay and having them turn it in within two weeks, you would break up the assignment into multiple steps. To begin with, you could have students use AI to help them research a desired topic. In a following class, you could have students write out, in-class, key aspects that they want to cover and then

create an outline. Next, students could write out a rough draft. These rough drafts could then be peer-reviewed to give students an opportunity to see what others are doing and to work on specifically identifying key components of a good essay (the use of a peer review checklist like this: is strongly encouraged to help guide and focus students in the process). Students would then give a copy of this peer review to the other student and to you as the instructor.

Continuing on with this example, you could have students use Track Changes or a specialized writing transparency tool like Grammarly Authorship, to help students improve their essays based on feedback from both their peer and you as the instructor. Additionally, you could have students create a separate annotated bibliography where students would need to express why they chose the different references used. Finally, as part of this assignment, students could be required to potentially give a presentation or just answer questions in class on their final essay. This would help hold students accountable for their learning and give them a deeper understanding of the work they created by being ready to answer questions about their essays.

Through the example expressed, there would be plenty of opportunities for you, as the faculty member, to see students' progression and development with their capabilities. Clearly seeing a C level (average) rough draft essay suddenly turn into an A+ level paper would provide you with an opportunity to interact with the student and ask them more direct questions to see if their cognitive abilities have indeed been enhanced or if they are inappropriately using assistance (such as through the use of AI).

The SHARE technique has been successfully used by my educational colleagues around the world to include in the United States, Canada, Jamaica, Australia, Great Britain, Germany, Armenia, and Tunisia (Figure 6.1). I have also created a video explaining this instructional design technique, available on my educational YouTube channel here: <https://youtu.be/QRTsH-RHFFY>.

A final thing to consider when reviewing the SHARE technique is its overall goal. Remember, that we aren't trying to make things AI proof, we are just trying to help ensure that AI is being used when we, as the instructor, want them to use the AI and that regardless of AI use, students are still being held accountable for their learning. Additionally, when we look at all the components of the SHARE technique, when we take a step back and look at it as a whole, we realize that it is simply good instructional and assessment design. Notice how it maximizes engagement, realism, motivation, and overall hands-on learning; this is what good student-centered learning is all about.

## The SHARE Technique

### To Enhance Assignments and Assessment in the Age of AI

<b>S</b>	<b>Strong &amp; More Authentic:</b> Add rigor, realism (match real world: report, article, posting, use AI) & grounding (specifics from class, demos, guest presenters, case studies). This also increases motivation
<b>H</b>	<b>High Price for False Info:</b> More points taken for made-up/hallucinated quotes, facts, citations/references. On rubric for creditability, accountability, consistency, and flow
<b>A</b>	<b>Additional and/or other Assessment Techniques:</b> Student presentations ( <i>viva voce</i> ), Q&As, visual works, student podcasts, in-class writing/quizzes, group work, etc.
<b>R</b>	<b>Reflection/Critical Analysis of Feedback:</b> Critical writing on feedback, process, and what was learned/experienced. Understanding of what/why. Done in-class or out.
<b>E</b>	<b>Expanded Assignment:</b> Progression can be seen. Ex: 7-Step Writing Process, rough draft, track changes, peer-observation, & annotated bibliography (why sources used).

Figure 6.1 SHARE technique.

## Summary

The assessment aspect of course alignment functions as an important component of a student's learning journey. As demonstrated, AI can be used in a multiple of ways to help us implement different types of assessments in order to develop students' understanding and then obtain evidence of students' learning and achievement of the SLO. Academic misconduct was described, along with specific actions that can be taken to help minimize the issue. Additionally, it was demonstrated that AI could be used to help with the grading process, although there are some important pros and cons to consider. Finally, the SHARE technique was introduced and explained on how assessments and assignments could be designed in order to best address the use of AI by students through these evaluations. Now that we have gained a firm understanding of assessment, we can move on to the third and final step in the instructional design course alignment process, deciding on what instructional strategies to use to best prepare students for the Assessment to fully achieve the SLO.

# Instructional Strategies 7

## Role and Importance of Instructional Strategies

Instructional strategies, which is the overall pedagogy, should be understood as specific actions that faculty take to direct student activities that will help them learn and be able to accomplish aligned assessments to provide evidence of attainment of the student learning outcomes. Put another way, Biggs states, “The ‘alignment’ aspect refers to what the teacher does, which is to set up a learning environment that supports the learning activities appropriate to achieving the desired learning outcomes” (2003, p. 1). Biggs also sites another learning researcher, Thomas J. Shuell (1986), who powerfully expresses the importance of hands-on student-centered learning when describing this concept,

If students are to learn desired outcomes in a reasonably effective manner, then the teacher’s fundamental task is to get students to engage in learning activities that are likely to result in their achieving those outcomes ... It is helpful to remember that what the student does is actually more important in determining what is learned than what the teacher does.

(p. 429)

Keep this definition and understanding in mind in that the focus needs to be on using instructional strategies that focus on engagement and getting students to do things and apply skills in order to maximize learning.

## Instructional Strategies: Teaching/Learning Activities

In listing and describing the following instructional strategies (teaching/learning activities), note that they should be selected based on what would

DOI: [10.4324/9781003568544-7](https://doi.org/10.4324/9781003568544-7)

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provide the greatest benefit to the student. You need to ask yourself, based on the topic, my students' level of understanding, time, resources, and required summative assessments, which are the best learning strategies that I should implement.

**Presentation:** With this activity you dynamically present information using excellent verbal and non-verbal communication skills, as well as with the use of helpful visuals/media. Questions are also integrated to ensure engagement with students. This type of activity should not last more than 15 minutes since it is still somewhat passive and not as hands-on as other teaching activities.

**Discussion:** This is a more student-centered activity that should be focused on more with open-ended questions to encourage critical thinking and deeper analysis. Students should be encouraged to share their ideas and opinions for enhanced social and collaborative learning via the conversation that is still guided by you, the instructor. The Socratic method (questioning beliefs, requiring evidence of thought) could be used, but it is important to have maximum participation in the discussion.

**Demonstration:** With this technique, you physically show students a process or utilization of a skill. It is recommended to do it once at full speed without explanation (allowing students to simply observe), and then demonstrate the process step-by-step with an explanation. This can then be repeated as many times as necessary for students to understand and to answer any questions they may have. Students should then actively participate and accomplish what was demonstrated.

**Role-Play:** This highly recommended dynamic teaching and learning activity involves having students assume different roles (characters/viewpoints) in order to gain a better understanding and experience from that perspective, to obtain enhanced empathy, improved communication skills, and greater problem-solving capabilities. This learning strategy is often used in business, healthcare, and education (but can be used in any field) because of its effectiveness and increased emotional connection (Fu & Li, 2025; Rao & Stupans, 2012).

**Simulation:** Similar to Role-Play, simulations involve having students assume a role and go through an activity that mimics a real-world event with similar conditions based on the learning focus. Simulations are often enhanced with technology to increase environmental realism or processes. This allows for repeated practice in a low-risk/risk-free environment. Enhance realism as needed and as students are ready for more realistic opportunities to display their skills and gain more usable experience.

**Games/Gamification:** Games can be any type of fun interactive challenge (physical or digital) between individuals or groups (groups are recommended) that have game elements such as points, levels, and competition. Some simple classroom educational games would be Jeopardy, Family Feud, or even Charades, where the game content is the course subject matter. Gamification is where you use the game elements throughout the course.

**Project/Problem-Based Learning:** With this strategy, students work on projects (generally in groups) to solve real-world type problems requiring research/investigation, critical thinking, collaboration, and some level of self-directed learning. Generally, students give a presentation of their project solutions to the class and/or the public.

**Student Presentations:** This is an active learning strategy that requires students to properly prepare for and use communication skills to articulate specific aspects of their assignment (a project, essay, poster, podcast, video, etc.). Generally, a Q&A (questions and answers) session is attached at the end of a student presentation, requiring them to fully know their content and use critical thinking to provide adequate answers.

**Case Studies:** This active learning method requires students to critically analyze a hypothetical or real scenario (real scenarios are recommended in that they increase motivation). Students then identify problems and develop solutions. This can be done in conjunction with role-play by having students assume different roles within the case study to understand the problem(s) and solutions from different perspectives.

**Debate:** This is a structured argument activity that requires students to develop and defend opposing views (students can either self-select which side they will be on or it can be assigned to them). Students must use critical thinking, research skills, and persuasive communication skills to win the debate. The instructor moderates and ensures civil engagement.

**Peer Teaching:** With this learning strategy, students are taught directly by other students. The students are given a class topic to cover along with enough time to properly research, develop their presentation/learning activity, and practice. Then, along with additional guidance from an instructor, they conduct the class.

**Other Experiential Learning Activities:** Field trips, guest speakers, special field assignments, service learning, internships, and other hands-on, real-world activities deepen students understanding by providing real engaging experiences. Incorporating professional experiences provides industry insights, community involvement, critical thinking, networking opportunities, and allows for application of academic concepts (theory) into practical knowledge (praxis).

**Lecture:** An instructor-led, one-way, passive form of communicating course content to students for the entire course period. Although saving time and requiring less preparation by the instructor, this technique has been found to be the least effective way to teach, which often results in students feeling bored and losing focus (Firdaus & Mukhtar, 2025; Freeman et al., 2014; Samsuri, 2024).

A mixture of different instructional strategies is recommended to provide variety, interest, and increase motivation. Having elements of surprise and novelty helps students stay focused and enthusiastic in the course and learning process overall. Additionally, by using various types of teaching and learning activities, information is presented in different formats, and students engage with the learning process in multiple ways, which aids in overall understanding.

### *AI Activity*

Artificial intelligence (AI) can be used in different ways with instructional strategies, such as to help us choose which learning strategies, teaching and learning activities, would be best for our specific situation. As an example, go to your preferred AI, start a new chat session, and use the following **prompt**:

Please assume the role of a professional instructional designer and a professional communications university lecturer. Please help me decide on the best pedagogical approach for teaching and learning activities to use with my students to address the topic of interviewing. I have two weeks (four class sessions) to cover this topic. Their summative assessment for this will be that they will be required to conduct an interview, outside of class, with a person who is currently working in the field that they plan to go into after graduation. They will then write a reflective essay in the form of a 700 to 1000-word blog or news article. This ties in with the course's student learning outcome of "Apply effective interviewing techniques using critical thinking and persuasion for enhanced information gathering and network development." Do you need any other information?

The results from this prompt (tested with ChatGPT and Grok), recommended, in addition to the use of short presentations on the topic, the use of in-class practical exercises where students would role-play the interviewer and the interviewee to gain experience in the interview process. Additionally, the

use of a guest speaker is suggested so that students could practice developing and asking questions to someone from outside of class but still in the lower stress environment of the class before doing the full summative assignment.

Another way that AI could be used in the process of developing one's instructional strategies is to use our developed understanding of instructional design, select an activity on our own, and then ask the AI for assistance in implementation.

Once again, go to your preferred AI, start a new chat session, and use the following **prompt**:

Please assume the role of a professional instructional designer and a professional communications university lecturer. For the next two weeks (four class periods) I will be teaching my students the topic of interviewing. Their summative assessment for this will be that they will be required to conduct an interview, outside of class, with a person who is currently working in the field that they plan to go into after graduation. They will then write a reflective essay in the form of a 700 to 1000-word blog or news article. This ties in with the course's student learning outcome of "Apply effective interviewing techniques using critical thinking and persuasion for enhanced information gathering and network development." I'm thinking of using games/gamification as my pedagogical approach. What type of activities should I do to best prepare my students with this technique? Do you need any other information?

Testing the prompt with both ChatGPT and Microsoft CoPilot resulted in recommendations to use engaging mini-presentations to introduce and explain the topic, followed by different games. One suggestion was a simple gameshow:

Interview Jeopardy: Create a Jeopardy-style game with categories related to interviewing skills, such as "Body Language," "Types of Questions," "Active Listening," and "Common Mistakes." Students compete in teams to answer questions and earn points.

Another suggested game was the Mystery Interviewer Game:

- Split students into small groups and give each group a card with a profession on it (e.g., software engineer, marketing manager, biochemist).
- One student in the group takes on the role of this professional but does not reveal their identity.

- The rest of the group must use critical thinking to develop and ask well-structured questions to figure out what the job is based on their answers.
- Debrief: Discuss what types of questions helped the most in gathering information.

The AIs additionally recommended other gamification components such as the use of scoreboards (for friendly competition), the awarding of badges or rewards for achievements (e.g., “Best Follow-Up Question” or “Most Engaging Interviewer”), as well as bonus points for students who go above and beyond in the class activities.

Another way that AI can be used as a powerful tool, is to use the AI itself as an instructional tool and learning activity. In doing this, the AI will be used as a learning activity and assignment (homework) at the same time, which has been shown to be an impactful teaching and learning practice (Grodner & Rupp, 2013; Papandreou, 1991). In the following example, the AI is used as a simulation to help students practice and prepare for a “real” face to face summative assessment.

Go to your preferred AI, start a new chat session, and use the following **prompt**:

Please assume the role of a real-life professional marketing executive with 10 years of experience working at Google, in California, USA, whom I will be interviewing to gain a better understanding of this person’s specific experience and this professional industry as a whole. Let me ask questions, and then you answer, and I reply so I can practice my interviewing skills. After you answer five questions, give me usable feedback on how well I conducted the interview (active listening, follow-up questions, etc.) and what I can do to improve.

This prompt (tested with ChatGPT via both text and voice) helps students implement what was initially learned in class. In many instances, this can help put theory into practice by letting students practice/rehearse their skills and capabilities. I recommend that you have your students use this prompt (modifying it as needed) through an AI’s voice mode to enhance the realism and emotional connection that comes through interacting with a realistic and emotional human-like voice.

Another way that AI can be used as a powerful tool to help with instructional strategies, is with case studies. In addition to using AI as a simple search engine to find appropriate case studies to use with students, AI can be used to help create case studies from news articles.

First find a suitable news article with enough detail to address the subject matter or issue that you want your students to learn about. Ensure that there is a problem/issue that students will have to identify, analyze, and create possible solutions to address the situation.

Go to your preferred AI, start a new chat session, and use the following **prompt**:

Please assume the role of a university instructional designer and business professor. Use only the details within the news article at <https://www.bbc.com/news/articles/czxkn393rww0> and create a case study that I can use to teach my students. I am instructing juniors and seniors in a business course dealing with how companies respond to the public when unexpected problems occur and want them to develop their critical thinking skills in applying what we are learning to real life situations.

The results of this prompt (tested with ChatGPT) are excellent questions that can be used within your case study teaching and learning activity. Remember that you are the subject matter expert, the instructor, and the one in charge. You could always tell the AI to create different questions or to focus/modify the question in whatever way you see fit to best address what you are trying to teach your students. This example (feel free to modify to best suit your needs) provided me with a 90% solution to create an engaging, inclusive, and motivating case study instructional strategy for my class.

## Challenges and Solutions with Instructional Strategies

Active learning strategies are very beneficial with proven effectiveness but can have some challenges (Børte et al., 2023; Ndebele & Maphosa, 2013). The following are main challenges that you could face as you use these teaching and learning activities along with solutions to best address/prevent these issues.

**Student Hesitancy:** To ensure that students are fully willing to participate, you must ensure that a good, safe environment has been established. This means that no one will be ridiculed, and all engagements will be civil and constructive. Additionally, students need to be explicitly informed as to the relevancy of the activity and why/how this will directly help them learn and perform well on the assessment(s).

**Lack of Collaboration:** Help students to get to know one another as soon as possible and explicitly express the need for the class to develop into a

community of practice where everyone is there to help one another out. Show your humanity and instructional presence and be a role model by role-playing or going through processes first before asking students to do the same. Keep the environment friendly and highlight the benefits of working together.

**Running Out of Time:** It takes time to create and manage good learning activities. Often students and even instructors can get so engaged in a good activity that keeping track of time is forgotten (that is a powerful and impactful activity). To help address these issues, AI can be used to help design and organize teaching and learning activities, and timers/alarms can be placed. Tell students when they only have one or two minutes left on an activity to help keep things on schedule.

By using AI, additional technologies, contemplation, and planning, all of these challenges can be easily overcome. Remember that you now have a much better understanding of both instructional design and AI. You can now use this knowledge to use AI as a powerful tool to assist you if any other challenges come up or to learn more about any of the instructional strategies listed. Try different teaching and learning activities little by little and take note of which of these strategies are highly effective or ones that aren't as effective and modify as needed. The AI can assist with that as well by describing situations and results and asking for analysis and recommendations.

## Summary

The instructional strategies aspect of course alignment functions as another key component of a student's learning journey and as the third part of the backward design process ((1) SLO, (2) assessment, and (3) instructional strategies). This chapter covered the many different types of teaching and learning activities that can be used as instructional strategies, with the overall recommendation to use multiple teaching and learning activities to maximize understanding, focus, and motivation. As demonstrated, AI can be used in a multiple of ways to help with choosing teaching and learning activities, creating or modifying activities, and even functioning as a teaching and learning activity itself (simulation example used). Additionally, the use of AI as an assistive tool was highlighted when describing different challenges and solutions with learning strategies. The following chapters deal with other important aspects of instructional design, such as motivation and instructional presence, and how AI can be directly used to assist with those aspects as well.

# Motivation

# 8

## Role and Importance of Motivation

Motivation is often an abstract afterthought for many instructors, which is a travesty in that motivation is a key aspect, if not the most decisive aspect, in determining if students learn or not. Motivation is reasonably defined by most people as: the reasons or driving factors for behaving in a certain way. This is good but still abstract and doesn't provide enough understanding to fully help us with teaching and learning. Learning science researcher John Keller, in his seminal work on educational motivation, describes motivation as the process that initiates, directs, and sustains learner behavior toward achieving an educational goal; the emphasis being not just about arousing interest but also about maintaining focus and engagement while fostering persistence in learning (1987).

Additional important aspects of motivation in education include how artificial intelligence (AI) can now enhance students' agency, affecting their locus of control (belief that one's actions/efforts affect change in the world around them) and self-regulated learning (ability to be self-motivated, self-directed learners) (Chang et al., 2023; Rotter, 1966; Zimmerman, 2008). Some educational researchers are now also stressing the importance of motivating factors found within "... the interwoven relationships between learners, educators, and materials [such as AI] within educational settings, suggesting that these elements are deeply interconnected and cannot be understood in isolation from each other" (Lodge et al., 2023, p. 4). Throughout this chapter we will gain a better understanding of motivation in education and how AI can help us obtain it.

DOI: [10.4324/9781003568544-8](https://doi.org/10.4324/9781003568544-8)

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## ARCS Model of Motivation

John Keller' ARCS (Attention, Relevancy, Confidence, and Satisfaction) model of motivation has been shown to enhance student academic performance and gives us in academia an easy-to-understand way to view motivation and incorporate it into teaching (Cai et al., 2022; Fang et al., 2024; Mirzaei et al., 2024). The following will explain each component of the ARCS model of motivation and provide examples on how AI can be used to help address each component within our teaching and learning activities (Keller, 1987; Song & Keller, 1999).

### A: Attention

The first element of the ARCS model for educational motivation is attention, which deals with not only obtaining students' focus (a requirement for learning) but sustaining their attention on the instructional material throughout the educational session. An instructor needs to provide the right amount of stimuli to arouse students' curiosity but balanced to avoid anxiety and hyperactivity.

Keller explains that this can be done in many different ways and recommends that all faculty ask themselves the following important question before each class session: What can I do to capture their interest, to stimulate and sustain an attitude of inquiry? Here are some specific possibilities to consider:

- Use novel approaches, personal and/or emotional material, appropriate humor.
- Ask contemplative questions, create paradoxes, and provide thinking challenges.
- Vary presentation styles with analogies, examples, and unexpected events.
- Present problems or conflicting information along with captivating visuals.
- Use engagement: role-playing, simulations, and give students options/choices.

### AI Activity

AI can be used with each part of this motivational model to help us address and maximize these components individually. As an example, go to your preferred AI, start a new chat session, and use the following **prompt**:

Please assume the role of a professional university instructional designer and English Professor. I am about to teach my students about

the importance of and how to properly use the APA (American Psychological Association) style of citing and referencing. I want my students to be able to do this properly because they will use it throughout their time at the university and possibly as part of their work life. I want to ensure that students are properly motivated to succeed with this. Suggest some specific ideas I could try to address the Attention component of John Keller's ARCS model of motivation with regards to my class.

The results of this prompt (which you are free to modify as needed), this time used with Microsoft Copilot AI, yielded eight different ideas on what I, as the instructor, could incorporate in my class to increase the Attention motivational component. Everything from starting off with a compelling story of the subject's importance, to creating a citation scavenger hunt where students find sources and practice creating correct APA citations on the spot, was recommended. Remember that this is a conversation with the AI so at any point you can ask for more details or clarification as well as to simply give you more ideas.

I continued this conversation with the AI and asked it to give me five more ideas. One of the ideas I really liked was to incorporate pop culture. So instead of just using an academic source when demonstrating proper citation, you could also show how to properly cite a trending YouTube video or other currently popular entertainment example.

## *R: Relevancy*

Relevancy is important to help students answer the questions of "So what," and "Why is this important?" Faculty should be explicit in helping students see why the content being learned is valuable to help students better understand a larger concept, how this knowledge will help them with short-term and long-term goals (getting good grades, doing well in a future job, other), and the intrinsic value in knowing more and being further educated (wisdom). Relevance can also be addressed with needs-matching dealing with students' desires to succeed in accomplishment in general, with the specific field being addressed, and of interest to them specifically. There are also other multiple techniques to help address this motivational component:

- State explicitly how the information to be learned is important and useful.
- Ask students to relate the instruction to their future goals.

- Explain how learning the content has intrinsic value on its own and is a great accomplishment (wisdom).
- Describe how the content is interesting and is something that those in the field need to accomplish and fully know (need for affiliation).
- Bring in a guest presenter with direct experience about the importance of the topic.
- Be an example by directly modeling enthusiasm and excitement for the topic and offer students choices when possible so they can focus on personal relevance.

## AI Activity

We can again use AI to help us address this motivational component individually. Go to your preferred AI, start a new chat session, and use the following **prompt**:

Please assume the role of a professional university instructional designer and English Professor. I am about to teach my students about the importance of and how to properly use the APA (American Psychological Association) style of citing and referencing. I want my students to be able to do this properly because they will use it throughout their time at the university and possibly as part of their work life. I want to ensure that students are properly motivated to succeed with this. Suggest some specific ideas I could try to address the Relevancy component of John Keller’s ARCS model of motivation with regards to my class.

The results of this prompt, this time tested with Google’s Gemini AI, yielded many great possibilities that correlated with the recommendations given. One specific idea that I felt could be very impactful was:

Connecting APA to Real-World Success:

“APA in Action” Showcase: Start the unit with a showcase of how APA is used in various professional fields. Don’t just talk about it; show them:

- **Published Articles:** Display articles from their specific fields of study that use APA. Point out how the citations and references are integral to the research process and contribute to the credibility of the work.
- **Professional Reports:** If possible, find examples of reports or documents used in professional settings (e.g., business reports, policy

briefs) that utilize APA or a similar style. This demonstrates the transferability of the skill.

- Job Postings: Find job postings in fields relevant to your students that specifically mention APA or strong writing skills as a requirement or preference. This makes the connection between academic success and career prospects concrete.

### C: Confidence

This component of motivation is very important in that it has a great effect on students' persistence, engagement, and accomplishments. This correlates with aspects of Carol Dweck's *growth mindset* in that it is important for students to understand and believe that their success comes from their effort as opposed to simple luck; that something difficult is a challenge to overcome, not an obstacle to avoid (Dweck, 2006).

Keller states that faculty need to generate or maintain motivation by fostering, "the development of confidence despite the competitiveness and external control that often exist in schools. ... to help the learner form the impression that some level of success is possible if effort is exerted" (1987, p. 7). His recommendations to help accomplish this are:

- Always provide clear assessment instructions and grading criteria (rubrics).
- Present content in an increasing level of difficulty so that it is "conquerable."
- Make statements dealing with real possibility of success with adequate effort.
- Help students set goals that are realistic with manageable plans.
- Explicitly attribute students' success to their effort instead of luck or task difficulty.
- Give students opportunities to fail and develop without seriously affecting their grades.
- Provide multiple ways that students can practice skill development on their own.

The only thing that I would add to this portion of motivation is that it is also important for students to be confident in *you*, the instructor. They should be confident that you are a subject matter expert in what you are teaching, that you are presenting the content in a logical way so that it can be learned, and that you are fair and impartial. This aspect of confidence can be addressed by using good verbal/non-verbal communication to show

your professionalism, explaining your credentials and/or experiences, using formative and summative assessments with usable feedback, and giving clear instructions with rubrics to ensure logical progression, understanding, fairness and student learning outcome tie-in. Students will be confident in you if you present yourself in a confident, organized, and caring way.

## AI Activity

Once again, AI can be a very useful tool in helping us individually with this motivational component. Go to your preferred AI, start a new chat session, and use the following **prompt**:

Please assume the role of a professional university instructional designer and English Professor. I am about to teach my students about the importance of and how to properly use the APA (American Psychological Association) style of citing and referencing. I want my students to be able to do this properly because they will use it throughout their time at the university and possibly as part of their work life. I want to ensure that students are properly motivated to succeed with this. Suggest some specific ideas I could try to address the Confidence component of John Keller's ARCS model of motivation with regards to my class.

In this case, the AI (Google Gemini AI) provided great results with a variety of ideas that addressed the suggestions provided. Several of the ideas presented highlighted the need to use *scaffolding* to help students develop confidence in their APA skills. Here is one idea the AI provided that was a good example of this:

- Provide Checklists and Templates: Offer readily available checklists for different source types and templates for formatting papers. These tools provide structure and support, reducing anxiety and boosting confidence.

Once again, remember that we can continue the conversation here by asking it to create these checklists and templates for us or to at least give us a rough draft to more efficiently complete for our specific applications. I actually did this by giving it the **prompt**:

I really like your idea of "Provide Checklists and Templates." Please go ahead and create those for me now. Please format them as visually appealing spreadsheets.

It provided very usable results that would function as helpful scaffolding to help my students in the learning process while also helping to develop their confidence.

### *S: Satisfaction*

This motivational component deals with helping students feel good/positive about their learning accomplishments. Mainly derived from reinforcement theory, the idea is that students will feel more motivated if the learning task is appropriately reinforced/rewarded (Skinner, 1961). However, this doesn't fully account for all students' behavior in that "... attempting to control achievements outcomes directly through extrinsic rewards ..." can fail or backfire, leading to "... lower-quality motivation and performance" (Ryan & Deci, 2020, p. 2).

In light of these different aspects of intrinsic and extrinsic rewards, Keller emphasizes the need for an appropriate balance to avoid overcontrolling and to help students develop greater levels of intrinsic satisfaction. Suggestions to help develop satisfaction are:

- Provide opportunities for students to use newly developed skills in a realistic setting as quickly as possible and appropriate (to use and appreciate their new capabilities).
- Explicitly and verbally acknowledge and reinforce students' intrinsic pride when successfully completing or improving upon difficult tasks.
- Give personal attention to students and model internal pride for effort shown.
- Provide helpful and informative feedback as soon as possible.
- Provide motivating feedback to help students see successful effort accomplishment
- Ensure all students see the accomplishments and progressions made through the time spent within the course = valuable use of time well spent

### AI Activity

This final component of motivation can also be individually addressed with AI. Go to your preferred AI, start a new chat session, and use the following **prompt**:

Please assume the role of a professional university instructional designer and English Professor. I am about to teach my students about

the importance of and how to properly use the APA (American Psychological Association) style of citing and referencing. I want my students to be able to do this properly because they will use it throughout their time at the university and possibly as part of their work life. I want to ensure that students are properly motivated to succeed with this. Suggest some specific ideas I could try to address the Satisfaction component of John Keller's ARCS model of motivation with regards to my class.

The results of this prompt (used with Google Gemini AI) were excellent in that it provided suggestions for both extrinsic and intrinsic reward possibilities. Some of the great ideas dealing with extrinsic rewards included the use of "APA Ace" Badges or Certificates, and bringing in "... a representative from Career Services to talk about the importance of APA style in professional settings. This can help students see the long-term value of mastering this skill and increase their motivation to learn it."

The suggestions for intrinsic rewards were also very useful. Some key suggestions included placing an emphasis on how properly using APA actually protects students' intellectual property as future writers and researchers and how "... This connects the skill to a real-world need, making it more meaningful. When they see the direct link, the 'aha!' moment fuels intrinsic satisfaction." Another great suggestion for intrinsic motivational satisfaction was to "Highlight how correct APA citation enhances the credibility and professionalism of their work. This shows students that mastering APA style is achievable and valued."

Now that we have gained an enhanced understanding of motivation, have seen how it can greatly enhance the teaching and learning experience, and have used AI to address each component individually, we can use AI as an assistive tool to help us with all aspects of the ARCS model at the same time.

## AI Activity

Go to your preferred AI, start a new chat session, and use the following **prompt**:

Please assume the role of a professional university instructional designer and English Professor. I am about to teach my students about the importance of and how to properly use the APA (American Psychological Association) style of citing and referencing. I want my students

to be able to do this properly because they will use it throughout their time at the university and possibly as part of their work life. I want to ensure that students are properly motivated to succeed with this. Suggest some specific ideas I could try to address all components of John Keller's ARCS model of motivation with regards to my class.

The results of this prompt (tested once again with Google Gemini AI) provided highly usable suggestions on all parts of the ARCS model of motivation to implement with the example class. If the suggestions provided don't seem adequate or appropriate for your given class, be sure to tell the AI and ask for additional suggestions. The "refinement" aspect of our advanced prompt formula means that you can keep interacting with the AI to obtain the necessary level of explanation needed to help ensure teaching and learning success.

## AI for Enhanced Student Agency and Motivation

AI can now greatly help students to improve their agency, thereby enhancing their motivation to learn and succeed, but only if their AI literacy is properly developed (Darvishi et al., 2024; Shen & Cui, 2024). This is also important for us as faculty because we often become students to enhance our qualifications as well as to model life-long learning. By developing students' AI literacy and specifically showing them how AI can be used to help them with their learning journey, their belief that their actions and efforts affect real change in the world around them (locus of control), and their ability to be self-motivated, self-directed learners (overall agency), greatly enhances (Chang et al., 2023; Rotter, 1966; Zimmerman, 2008).

AI literacy information was already provided in a previous chapter, but here are key ways that students can use AI on their own (along with prompt examples) to improve their agency, thereby enhancing their educational motivation:

**Additional Explanation:** Students can use AI to provide additional explanations to enhance, extend, and/or personalize what was provided in the classroom.

**Prompt** (example, modify as needed): Please assume the role of my university philosophy instructor. Explain Plato's the Allegory of the Cave and use computer science examples. I didn't understand the reading and I want to be able to talk about it in class today.

**Cognitive Level Manipulation:** Students can ask the AI to explain instructional content at any cognitive level needed (higher or lower) to help address their specific needs.

**Prompt:** Please assume the role of my university philosophy instructor. Explain Plato's the Allegory of the Cave as if I'm in high school. The instructor explained it today but it was too complicated. Use simple language and lots of examples for me.

**Timely and Actionable Feedback:** AI can function as a second pair of knowledgeable eyes to provide feedback 24 hours a day, whenever the student is ready. Also, notice the specific instructions given to the AI to provide usable feedback without academic misconduct.

**Prompt:** Please review this essay that I am providing you. Compare it to the requirements of the rubric that I am also uploading to you. Give me actionable feedback on how I can improve, but do not rewrite it for me.

**Idea Development and Prototyping:** AI can be used to help students develop their ideas, come up with new ideas, and to visualize their concepts for rapid prototyping. *Note that I usually have students come up with ideas on their own first, and then allow them to use AI to enhance their ideas or help them discover other possibilities.*

**Prompt:** Please create an image of a cool, trendy sofa shaped like a coffee cup with a male and female university student in it. I am trying some prototype ideas for my entrepreneur class and need a good visual for my business concept.

**Practice and Rehearsals:** AI is a powerful study buddy that can pose questions to students or be used to help students gain experience by functioning as a simulator for many different types of situations/scenarios assuming any type of role. This can be enhanced via using enhanced AI voice mode or visual interactions.

**Prompt:** Please assume the role of a professional in the field of Marketing. Let me interview you so I can practice my interviewing skills. After you answer five questions, give me usable feedback on how well I conducted the interview (active listening, follow-up questions, etc.) and what I can do to improve.

Providing students with an understanding of how to use these prompts for the different learning situations noted will greatly enhance their learning agency and contribute to greater educational motivation. It is important that students also develop general foundational knowledge of AI through AI literacy and to be fully aware of policies dealing with AI and its use within their educational institution.

## Summary

This chapter covered the very important topic of motivation, its different components as explained through the ARCS model of motivation, and associated aspects of motivation related to locus of control and agency. The use of AI to help with instructionally designing motivation components within one's course was highlighted through multiple examples. Additionally, the powerful way that students can use AI on their own to gain greater control (agency) of their own learning was explained, leading to enhanced student learning motivation. Example prompts were provided to specifically show how AI can be used in different aspects of students' learning while also avoiding the use of AI for academic misconduct.

The following chapter on Instructional Presence provides useful information to help improve teacher-student relationships and develop a better community of inquiry within each course. The use of AI will be highlighted as a tool to assist with this process. Notice how some motivational aspects addressed within this chapter are also applicable in other parts of an enhanced teaching and learning process.

# Instructional Presence

# 9

## What Is Instructional Presence

Instructional presence is best defined as the purposeful actions and work of an instructor to create the environment and engagements needed to help students "... feel like a real learning member of an instructional community and not 'just a number,' that is not simply an unknown student just going through the motions of taking the class," additionally, it exemplifies that the person teaching the course is genuine, "... a real human person that students want to listen to, can approach, and interact with," and truly cares about the welfare and educational success of the student (Anders, 2017, p. 8). A majority of instructional presence is made up of the Community of Inquiry Model (CoIM) which is composed of cognitive presence, social presence, and teaching presence (ElSayad, 2024; Garrison et al., 1999) all of which play an important role and can be enhanced with artificial intelligence (AI) both in online and face-to-face instruction (Ariati et al., 2023; Lang, 2024; [Yang & Lay, 2024](#)).

## Community of Inquiry Model

Initially designed for online learning but since validated with face-to-face instruction, the CoIM identifies the three key components of cognitive presence, social presence, and teaching presence, as being "...crucial prerequisites for a successful higher educational experience" (ElSayad, 2024; [Garrison et al., 1999](#), p. 2). A key aspect of the model is not only in identifying the individual components but also in how these components interact with one another within the learning community (the instructor and students within

DOI: [10.4324/9781003568544-9](https://doi.org/10.4324/9781003568544-9)

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the class). Each one of these elements will be described, elaborated, and specific techniques will be identified related how AI can be used to help enhance each component of the CoIM.

### *Cognitive Presence*

This component of the CoIM deals with how students can develop meaning through ongoing communication with the instructor, the content, one another, and even within themselves. This then pertains to critical thinking, critical inquiry. Faculty need to actively develop an environment and situations to help students go through the critical thinking process (Practical Inquiry), which Garrison, Anderson, and Archer (2001) identify as consisting of four steps: (1) Evocative (a concrete triggering event), (2) Inquisitive (exploration/researching), (3) Tentative (reflection/justification), and (4) Committed (testing/defending). Notice how similar this is to the key components of Kolb's Experiential Learning Cycle, described in [Chapter 3](#), as consisting of having a Concrete Experience, Reflective Observation, Abstract Conceptualization, and then Active Experimentation (Kolb, 1984). This is an important observation to better understand this CoIM component.

### *AI Activity*

AI can greatly assist with this CoIM component through three powerful ways: Engaging learning activities with Scaffolding/Personalization, as a Facilitator for Reflection, and as an Experimentation Enabler.

### *Engaging Learning Activities with Scaffolding/ Personalization*

As demonstrated in [Chapters 7](#) and [8](#), AI can be used in a number of ways to help select and design assessments and instructional strategies to deeply engage students as well as help them explore and critically think about the content while learning. This could be extended through needed scaffolding and personalization. Go to your preferred AI, start a new chat session, and notice how both the creation of scaffolding and personalization can be applied in the following **prompt**:

Please assume the role of an instructional designer and professor in business. I am teaching a university course in Leadership and Management. I just finished a module with my students dealing with leadership resiliency. My student said she didn't fully grasp it and that it didn't seem that important. Create a short story that better illustrates the importance and use of resiliency within a marketing firm. She is a Junior, getting a dual degree in business and marketing. I think seeing how this would be specifically important to her field would better help her understand relevancy.

The results of this story (created instantly with ChatGPT) provide the student with helpful and highly personalized scaffolding that better allows her to think critically about the instructional topic and understand its purpose and importance.

### Facilitator for Reflection

AI can be used to create reading outlines along with deeply reflective questions for students to contemplate while they read and reflect on the instructional content. As an example, go to your preferred AI, start a new chat session, and enter in the following **prompt**:

Please assume the role of an instructional designer and professor in cyber security. I teach sophomore students a university course in Intro to Cyber Security. Please review the reading I am uploading to you and create an outline of it with deeply reflective questions for each main section to help students think critically and answer while going through the reading material. This is an important reading that I really want them to understand so that we can discuss it in class and reference it throughout the semester. Do you need any other information to give me the best response?

Using this prompt (tested with ChatGPT) creates a very usable reading outline with good reflective questions that cause students to think more critically and personally about the reading material. This could be used even further by asking students for their reflective question responses in class and then asking them to further explain their answers in a discussion to help students be accountable for their learning.

## Experimentation Enabler

The power of AI lies in its versatility. Students can use AI in many different ways to help them experiment with and test hypotheses as well as defend their thoughts and understanding. AI can serve as a virtual lab or partner to role-play debates with to help students with the important process of critical thinking and analysis.

As an example, go to your preferred AI, start a new chat session, and enter in the following **prompt**:

Please assume the role of a professor in American history. I am a freshman at the university taking a somewhat advanced course dealing with World War II. The professor said that any student might be called upon during our next class to give our opinion and fully defend it, on the dropping of the atomic bomb on Japan on the sixth and ninth of August, 1945, to help end the Second World War. Pretend that we are in a class debate. You start off by asking me for my opinion, I'll answer, and then you give a rebuttal. Let's go back and forth for four iterations and then give me overall feedback on how I did. I want to be fully ready to do this in class, in real life successfully.

This powerful prompt (tested with Claude AI) can give students a powerful experience where they have to critically think, express themselves effectively, and fully defend their reasoning pertaining the course material. In this case AI acted as a simulation that can be enhanced by using voice mode (or possible video mode), all to help the student prepare for real-life application in the classroom. The more real/realistic experiences we can provide the student, the better their cognitive presence and preparation for graduation into real life.

## *Social Presence*

The Social Presence component of the CoIM is directly defined as "... the ability of participants in a community of inquiry to project themselves socially and emotionally, as 'real' people" (Garrison et al., 1999, p. 13). Its importance is then highlighted by their statements that "... socio-emotional interaction and support are important and sometimes essential in realizing meaningful and worthwhile educational outcomes." Working to enhance this social presence component is valuable in that it has been shown to bring students together as a community, which translates into higher levels of overall satisfaction and

enhanced support, leading to improved critical thinking, which also translates to greater learning achievements (Richardson et al., 2024).

A key aspect in developing good social presence within CoIM is not just helping students see each other as real and genuine people within the learning community but in also creating opportunities for authentic collaboration where more can be done with greater results because students are working together. “We believe it is essential that the process [of critical thinking] be done in an interactive and social environment [whenever possible]” (Garrison et al., 1999, p. 15). Additionally, social presence is enhanced through the development of its three subcomponents of emotional expression (articulation of true feelings/beliefs), open communication (polite civil discourse: being respectful), and group cohesion (friendliness with a true sense of belonging), (Anders, 2017; Garrison et al., 1999).

## AI Activity

AI can assist with this CoIM component first by simply helping us understand what can be specifically done to help with social presence, and then in understanding how to specifically do it within our course. Notice how these are both addressed within the following prompts. Go to your preferred AI, start a new chat session, and enter in the following **prompt**:

Please assume the role of a professional university instructional designer and Psychology professor. I’m teaching a university course in psychology. It is Psych 101, designed for freshman. Even though I have 100 students in my class, I still want to do more to develop social presence within my course as described within the Community of Inquiry Model, developed by Garrison, D. R., Anderson, T., & Archer, W. (1999). Give me 5 specific recommendations that I should consider. Do you need any other information in order to give me the best answer?

The results, this time tested with Google Gemini AI, resulted in multiple great ideas, as usual. Yet, I wanted to push the AI further, so I **prompted**:

Give me five more.

Remember that you are in charge and that this is an ongoing conversation. The last part of our advanced prompt formula is refinement, so you

can keep going. The AI provided me with five more great ideas to increase social presence within my course (I could have kept going and asked for more if needed). With this example, I decided to obtain further information and implementation instructions from the AI on the ideas I found most intriguing by **prompting**:

I really liked your ideas of “Personalized Video Updates and Announcements,” “Ask Me Anything (AMA) Sessions,” “Peer Review Activities,” “Psychology in the News Discussions,” and “Small Group Projects with Shared Deliverables.” Explain how to implement each one of these to enhance social presence within my psychology class of 100 students.

The AI provided me with nicely formatted and detailed instructions on how to effectively implement these ideas to increase social presence within my specific class. Remember to modify these prompt examples with as much detail as needed about your specific course(s) to obtain the best results possible from the AI.

Some other standard considerations to enhance social presence within your class are simply to get to know every student’s name and refer to them by name whenever possible, especially when greeting them in class. The use of students’ actual names has a powerful psychological effect that helps with community building (Murdoch et al., 2018; Sandstrom, 2023). Additionally, don’t forget about the simple formative assessment technique of Think, Pair, Share, that can be done at anytime and even in large classes. This technique (which also works as a learning activity) is very quick and, at the very least, gets students talking and thinking with one another. Finally, remember that you, as the instructor, greatly affect the social environment through friendly interactions, appropriate humor, and through the exemplification of a positive social demeanor.

## *Teaching Presence*

The Teaching Presence component of the CoIM is generally geared toward the purposeful and genuine instructor, but it can also be applied to students if they are conducting instruction as part of the course. Teaching Presence is an essential component in that it balances and helps to direct (through design, facilitation, and direction) the two other CoIM components of cognitive and social presence, through active facilitation of the teaching and learning process (Anderson et al., 2001; Garrison et al., 1999). Teaching Presence is further

described as having three subcomponents: Instructional Design and Organization, Facilitating Discourse, and Direct Instruction.

## Instructional Design and Organization

This subcomponent deals with personally developing and modifying course content in order to administer the course effectively. This calls for ensuring the right amount of formative and summative assessments using the best pedagogical approaches (to include needed modification based on delivery format such online, face-to-face, or hybrid). Additionally, this includes selecting and developing the right course materials and creating appropriate timelines and assignment specifics (instructions and rubrics).

To maximize teaching presence, it is important to truly personalize the material by ensuring it is up-to-date and as relevant as possible for the topic and students involved. This includes the developing of examples that allow students to use their own backgrounds and/or experiences to best connect with the learning material. Additional examples would be to include a policy within one's syllabus of creating a safe environment where all will be having civil discussions/discourse, as well as specifically choosing appropriate instructional activities such as group project-based learning.

The instructor needs to ensure that everything is properly working together, including students' motivations, to help ensure understanding and the full obtainment of the student learning outcomes(s). Put another way, every student needs "... to have a sense of the 'grand design' of the course and reassurance that participating in the learning activities will lead to attainment of their learning goals" (Anderson et al., 2001, p. 6).

## Facilitating Discourse

With this subcomponent, the focus is on encouraging and ensuring the proper management of class interaction, which greatly ties in with the larger aspect of social presence. When describing the importance of building understanding through the process of facilitating discourse, Garrison, Anderson, and Archer, highlight key requirements needed:

A process that is challenging and stimulating is crucial to creating and maintaining a community of inquiry. ... a collaborative community of learners. It is a process of creating an effective group consciousness for

the purpose of sharing meaning, identifying areas of agreement and disagreement, and generally seeking to reach consensus and understanding. Through active intervention, the teacher draws in less active participants, acknowledges individual contributions, reinforces appropriate contributions, focuses discussion, and generally facilitates an educational transaction.

(1999, pp. 24–25)

This is active work by the instructor that requires observation, participation, and purposeful contemplation in order to ensure that effective discourse is occurring. Additional aspects of engaging students, maintaining their focus/interest, and working on motivation through the use of active learning are an important part of this process. This is often done during classroom interactions such as discussion, role-play, and debates, but could take many forms such as web video conferencing, online message boards/forums, peer observations/evaluations, as well as simpler interactions like providing feedback on assignments and more. Focus on modeling appropriate behavior, providing good actionable feedback, and encouraging all students to participate.

## Direct Instruction

It is important to remember that you, as the instructor, are the subject matter expert. Yes, you should often function as the facilitator or guide on the side, but the reality is that you are always responsible and in charge of the teaching and learning within the class. You need to share your scholarly and critical thinking experience along with your capabilities as you help to direct cognitive presence and lead your class to the successful accomplishment of the student learning outcomes (Anderson et al., 2001).

Direct instruction is provided in a multiple of ways to include presentation of information in an engaging way, interjecting questions and comments to help students understand and diagnose as well as challenge preconceived notions or assumptions. By providing additional resources for students that want more, seeking additional challenging educational opportunities, as well as by providing needed scaffolding to help students advance and push themselves. Direct instruction is also extremely important during discussions to help ensure everyone actively participates in a civil manner, stays on track, and "... so that the conversation progresses beyond information sharing to knowledge construction and especially application and integration" (Anderson et al., 2001, p. 9).

Additionally, here are the top 12 actions that go into effective teaching presence and overall academic success, as identified in learning science research involving over 1000 students and 32 different higher education institutions (Shea et al., 2006):

1. Course goals communicated
2. Course topics communicated
3. Clear instructions provided
4. Due dates communicated
5. How to participate online
6. Netiquette
7. Identified areas of agreement
8. Sought to reach consensus
9. Reinforced student contributions
10. Set climate for learning
11. Drew in participants
12. Kept students on track

There is an additional aspect that goes into teaching presence (both for online and face-to-face instruction) that hasn't been fully articulated but has been implied; that is the idea of developing "warmth" or of genuine relationships where the students truly feel that the instructor isn't just their to do a job but actually wants the students to succeed for their benefit and for the benefit of society. Learning science research conducted on 297 college students resulted in findings showing that students were able to identify authentic teacher behavior, which was reported as consisting of "... being approachable, passionate, attentive, capable, and having expertise in their subject," and that this was being done "... out of genuine concern, respect, and care for the students" (Johnson & LaBelle, 2017, pp. 433–434).

## AI Activity

AI can be used in many ways to assist with teaching presence. Below are two examples dealing with portions of the subcomponents mentioned. Go to your preferred AI, start a new chat session, and enter in the following **prompt**:

Please act as a university instructional designer and political science instructor. I have been teaching my students (Freshmen) the different aspects of governmental powers within a democracy. During each class

period, I have two or three students share a current news article about the government using its power. We then have a discussion where I try to get my students to think critically about the situation and share their thoughts. I am having trouble keeping students on task, properly moving the conversation along, and staying within the allotted time of 15 minutes for the class discussion. I want to have a good teaching presence as part of the Community of Inquiry Model, as described by Anderson, Liam, Garrison, and Archer (2001). What would you recommend so that I can improve this situation?

The AI (tested with ChatGPT) provided great suggestions, such as enhanced structure to better manage time, the use of a visual timer that all can see, and varied discussion roles to keep students on track. To also address how this could be applied to online classes, I took this example even further with the following **prompt**:

Great. I am also planning on teaching this course to about 20 students next semester, but it will be done completely online. It will be a mix of asynchronous components and synchronous meetings. We will meet online once per week. I plan to use that time to have a lot of discussions, but I want to start off with this type of student news article led discussion. What would be your advice to help ensure staying on task and on time for an online video discussion?

The results were very useful and similar to what was provided before since they were still applicable, but everything was geared toward online instruction as requested within the prompt.

Here is a second example where AI can be used to help an instructor identify ways of being more approachable as expressed within the teaching presence aspect. Go to your preferred AI, start a new chat session, and enter in the following **prompt**:

Please act as a university instructional designer and a chemistry professor. I teach a chemistry course to freshman and sophomores that consists of 100 students. I love teaching and care for my students' success very much. Yet, I have been told by some students and via peer observations that I am not very approachable in class. Please give me 10 good suggestions of how I can be more approachable, even in a large class size like mine. I want to address this important teaching presence aspect

of the Community of Inquiry Model, as described by [Anderson, Liam, Garrison, and Archer \(2001\)](#).

The results of this prompt (tested with Grok AI) were exceptionally helpful with suggestions such as starting class with a short personal story connected to the topic, walking around and actively engaging with students during hands-on learning activities, use of students' names, and use of appropriate humor and light heartedness. I actually went even further with AI and **prompted**:

These are good ideas. I really don't consider myself a funny person. I want to be sure that my students take chemistry seriously. How, then, can I use appropriate humor and lightheartedness in my class? Give me some specifics on how I can do this, given my concerns.

The AI (tested with Grok AI again) gave a lot of usable suggestions to include periodic use of on-topic memes, lighthearted analogies to help explain content, and, my favorite suggestion:

### Use Chemistry-Related Puns or Wordplay

**Why It Works:** Puns related to chemistry are lighthearted, relevant, and unlikely to distract from the seriousness of the content. They also reinforce concepts, making them memorable.

**How to Implement:** Introduce a topic with a pun, such as, "Today we're diving into acids and bases – don't worry, I won't *pH*reak out if you have questions!"

When discussing elements, say, "Why don't we bond over the periodic table today? Let's talk about carbon – it's the element of surprise in organic chemistry!"

**Keeping It Serious:** Follow the pun immediately with a clear explanation of the concept to signal that the humor is a brief opener, not the focus. For example, "Now, let's get serious – acids and bases are critical for understanding *pH*, so let's break it down step by step."

In a similar way, the prompt used could have been modified to address any subcomponent or aspect of the teaching presence component of the CoIM. AI is so versatile that by simply putting in your specific situation and issues with details pertaining to your course, you will get very usable recommendations to maximize your use of the CoIM.

## Summary

This chapter covered the CoIM, its key components of social presence, cognitive presence, and teaching presence, and how putting it all together leads to enhanced overall instructional presence as part of successful instructional design. Through the development of the CoIM, we learned how the relationship between and among the teacher and students is enhanced, leading to a better overall educational experience.

AI was used in different ways to help address different aspects of the CoIM, with specific prompts demonstrated within the social, cognitive, and teaching presence components. Additionally, we used the power of AI to express its ability to help with CoIM in both online and face-to-face courses.

By extending the responsibilities of the teaching presence component of the CoIM, we reach the important topic of Accessibility. This topic, and how AI will be able to assist, will be addressed in [Chapter 10](#), Accessibility Issues. This is an important topic for all in that you most likely already have students with disabilities (even if they haven't disclosed it) or will likely have a student with a special need in the near future.

# Accessibility Issues

# 10

## Defining Accessibility in Education

Accessibility in education is generally defined as the ability for students to be able to fully participate and learn within a course, in spite of disabilities or special challenges associated with the learning process. This means that through proper instructional facilitation and reasonable accommodations, students can fully “access” the education needed to obtain the student learning outcome(s). Note that accessibility issues/challenges can be both temporary or permanent and might involve physical aspects, neurological issues, or a mixture of different situations.

Often, accessibility in education ties in with or overlaps with already established web accessibility standards such as the US Information and Communication Technology (ICT) Accessibility 508 Standards and the Web Content Accessibility Guidelines international standards. The web accessibility standards cover aspects such as text alternatives for any non-text media, allowing navigation without a mouse, proper use of informational color, and much more.

## Understanding Accessibility Issues

There are many different types of accessibility issues that students might face due to a number of factors. These learning challenges could be permanent, such as blindness from birth that would limit how the student can obtain instruction, or temporary issues, such as a broken leg or arm that would limit mobility and completion of assignments and assessments within the regularly allotted time. There are also neurological conditions such as dyslexia (a language processing disorder that can impact reading, writing, and/or

DOI: [10.4324/9781003568544-10](https://doi.org/10.4324/9781003568544-10)

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comprehension), dyscalculia (a condition that makes it difficult to properly understand and manipulate numbers), test anxiety, and many more. There are so many possible learning disabilities, conditions, or situations that all of them can't be listed here, but the key thing to understand is that there are a lot of these issues that some students struggle with. This might be reported to you as the instructor, yet sometimes the student might not want to self-report or the situation might not be fully understood; it could be undiagnosed.

## *AI Activity*

Generative artificial intelligence (AI) is pretrained with a wide range of information on many different types of accessibility issues that students might face and can also obtain updated information directly from the Internet. Because of this, AI can be used to help you understand any type of specific student disability or challenge that you might encounter in your teaching.

The following example demonstrates how AI can be used to quickly and easily obtain information on any type of accessibility issue that you might need to address (modify the prompt as needed for any future issue you might face). Go to your preferred AI, start a new chat session, and enter the following **prompt**:

Please assume the role of an instructional designer and educational professional with subject matter expertise in students with special needs. Explain what Sensory Processing Disorder (SPD) is. I am a high school biology teacher, and I will be teaching a student with this condition. Please explain it to me so that I understand and can better teach this student. Please also provide a usable academic link so that I can verify this information.

This prompt (tested with ChatGPT) provided great results, identifying SPD as “a neurological condition where the brain struggles to receive, interpret, and respond appropriately to sensory information from the environment.” It expressed that this condition is important to understand in an education setting in that “these sensory challenges can impact focus, behavior, and learning in a high school setting.”

Now that we better understand accessibility issues in education, we can turn to identifying ways to better address these issues in general and how AI can help us with specific accessibility issues that we might need to help students with during our teaching.

## Addressing Accessibility Issues

Many times, your educational institution's accessibility (sometimes called disability) office of support services will provide you with guidance on how to best address or accommodate a student that has some sort of disability or learning challenge. But remember that some students might not declare their issues before class or it might be undiagnosed. Once a disability or learning issue has been discovered, you, as the instructor, can also contact your institution's accessibility office or your direct supervisor/manager, such as a dean, and ask for guidance as well. Additionally, you can educate yourself to be better prepared for these possible situations.

Here is a listing of the most common accessibility/disability issues faced in education and some ways to address them:

1. **Dyslexia and Dyscalculia:** Dyslexia is a language-related learning disorder/challenge. Students struggle to properly process language. Students often reverse-read letters as well as words causing them to focus on trying to decode the word meaning resulting in sometimes failing to fully understand the entire sentence. Dyscalculia deals with difficulty understanding and manipulating numbers and math concepts. **Support Strategy:** Use multimodalities to help the student understand the reading content such as through videos, infographics, charts/graphs, and outlines. Provide step-by-step instructions when possible to help students understand the specific process(es) needed.
2. **Auditory or Visual Issues:** Students might have hearing or visual problems that they might be embarrassed about or haven't been fully identified. **Support Strategy:** Offer students the option to move closer to the front or closer to you to better hear/see. Additionally, provide instructional materials in a way that they can be easily used by assistive technologies such as text-to-voice screen readers and magnification software. When using videos, ensure that closed captions are available and turned on if displaying in class. Additionally, be sure to provide text descriptions for all images used in instruction.
3. **Mobility Issues:** Students might have problems moving and be in crutches, a wheelchair, an arm cast, or other movement issues. **Support Strategy:** Take students' movement issues into account when designing your classroom or when creating learning activities. If need be, integrate accommodations such as changing classrooms to an easier to get to location or create logical alternatives given the situation or issue being addressed. Assistive technology can also be used, such as having a student

go through a computer task via voice activation instead of using a mouse or keyboard if they have arm/hand movement issues.

4. **ADHD** (Attention Deficit Hyperactivity Disorder): Known as attention deficit hyperactivity disorder, this is a condition that makes it difficult for students to focus in class, obtain details, follow all instructions, and/or finish their homework within the appropriate time. **Support Strategy:** Use positive reinforcement to encourage appropriate behavior and constructive feedback to address inappropriate behavior. Give them visual aids such as checklists and/or charts to help them stay on track, and provide clear instructions in multiple formats that they can refer to as often as needed.
5. **Test Anxiety:** This is usually characterized by students having extreme fear and nervousness when taking a test due to overwhelming feels of extreme pressure to do well or worry from poor performance on previous tests. **Support Strategy:** Ensure effective test/exam preparation (such as a general match-up between formative and formative assignments/assessments), remind students of upcoming exams and help them prepare via practice tests and other study aids, and help students manage their time to study via physical and online reminders along with use of calendar invites and other time management tools. Finally, help students with test-taking procedures by letting them know what to expect, keeping things in perspective, breathing properly, and focusing on the positive through emotional regulation and viewing appropriate stress as an enhancement, a good thing to help with successfully passing the exam (Rozek et al., 2019).

## *Universal Design*

Another and more proactive way to view learning accessibility issues is through the lens of universal design. Universal Design is the purposeful creation of your instructional contentment and learning environment so that it provides maximum benefit and flexibility to everyone (Burgstahler, 2009; Mcguire et al., 2006). The previous example of ensuring that there were closed captions available for those with hearing disabilities is beneficial beyond helping someone with hearing challenges in that it can be very helpful to all involved. Perhaps the audio quality isn't very good, or the student listening is in an area with other noises. Maybe the audio is in English but, that isn't the listener's native language, or perhaps the person speaking has a heavy

accent or isn't speaking very clearly. There are multiple reasons why it would be beneficial to have closed captions beyond simply helping someone with a disability. Thinking about the development of your course and classroom in this way (Universal Design) helps in creating content that is highly usable and accessible to all for many different reasons.

## *AI Activity*

Let's continue with our previous example of a student with a learning challenge and see how AI can specifically help us to better ensure that the student will be able to succeed in the course during teaching and learning activities via appropriate support strategies. Go to your preferred AI, start a new chat session, and enter the following **prompt**:

Please assume the role of an instructional designer and educational professional with subject matter expertise in students with special needs. I have a student with Sensory Processing Disorder (SPD). I am a high school biology teacher, and we will be dissecting frogs next week. Please provide me with support strategies to help ensure that my student with SPD will be able to successfully complete this important learning activity. I want to do what I can to help all of my students learn and achieve all of our student learning outcomes.

The results of the AI (ChatGPT in this case) were very helpful. Suggestions included pre-dissection preparation (preview of sights/sensations), sensory modifications and accommodations (allow masks/gloves, etc.) and emotional/physical regulation development. Since I previously learned and verified what SPD is all about, I can properly consider these support strategies and decide how to best address the situation in helping my student succeed.

Another great example of AI's powerful use to assist in our learning when we have learning challenges is that of an adaptive tutor. In this case a student may have the temporary learning challenge of not being at the same cognitive level as those in the classroom. This student needs a simpler explanation first, in order to then more slowly develop additional understanding. Learning science research has found that AI can greatly help students in this situation (whether they have a learning disability or simply do not yet fully understand the material) by being able to quickly and easily

(and at any time) adjust the cognitive level of the required learning material (Deng et al., 2023; Michel-Villarreal et al., 2023). To better illustrate this, here is an example **prompt**:

Please assume the role of a university instructional designer and a computer science instructor. I teach a second-year course on functional programming. Please create a short lesson to help a student of mine who does not understand the concept of “Recursion.” We have gone over it in class, and everyone should have already learned it in a previous course. Make sure that this short lesson uses easy to understand language with a lot of examples. This student is having some problems keeping up, so I want to do what I can to help ensure this student’s success.

The results presented by the AI (tested with Grok AI) were very useful and appropriate to help this struggling student. The short lesson requested fully explained “Recursion,” in an easy-to-understand manner using simple language with multiple examples, a “how it works” section, and several practice problems to help the student actually go through the info and fully understand, as well as to feel confident on what they have learned. This support process allowed the instructor to help the struggling student with their learning challenge, increasing their accessibility to quality education, yet only took seconds of the instructor’s time to create and verify.

## Summary

This chapter covered accessibility issues pertaining to the many different learning challenges that students might have, manifested as permanent or temporary disabilities or challenges. A definition of accessibility issues in education was presented, along with information on understanding and addressing these issues. Several examples of accessibility issues were provided with effective support strategies for each. AI was highlighted as an effective tool to help in both understanding the many different types of educational accessibility issues along with techniques to help support students with these challenges. AI was used to fully explain virtually any type of learning disability issue and provide informational references in order to verify information in accordance with proper AI literacy. Finally, AI was used to help address educational accessibility issues in an effective an efficient manner so that all students can be fully supported.

In addition to educational accessibility issues, sometimes faculty have to deal with student behavioral problems. After understanding this important aspect of instructional design (which we will learn in the next chapter), we will see that many of the aspects of instructional design already presented in this book will help to prevent student behavioral problems in the first place. Additionally, we will learn how AI can also be used to help address this issue.

# Behavioral Issues

# 11

## Defining and Understanding Behavioral Issues in Education

Behavioral issues in the classroom are defined as any action(s) by the student that distracts the faculty member or other students, as well as student actions that deter from successful teaching and learning. It is also typically described as uncivil behavior. There are many reasons why a student might act in a disturbing/ disruptive manner; however, it typically falls into three main categories: the student's performance in the class, the class environment, and the instructor's actions or behaviors (McNaughton-Cassill, 2013; Valente et al., 2020).

A student might exhibit behavior issues because they aren't being academically successful in the classroom. That, in itself, could be due to a multiple of reasons (boredom, time management issues, learning disabilities, study deficiencies, personal/family problems, other), but the fact that they aren't succeeding in the classroom causes them to behave in a manner that doesn't help the teaching and learning processes. Conversely, they may also not be sufficiently challenged intellectually.

The classroom environment might also be causing or exacerbating students' behavior issues due to how the student is experiencing the learning journey. Students might act out if they don't feel valued or part of the community. If they are being picked on or bullied, it could cause students to not want to participate or act out aggressively. If classroom policies or processes are not fully understood or enforced, students might not feel fully safe to express themselves, feeling reprisals or humiliation.

The classroom instructor also plays a major role in students' behavior. Faculty that are not approachable, disregard or do not enforce school/classroom policies, avoid creating opportunities for student classroom engagement

DOI: [10.4324/9781003568544-11](https://doi.org/10.4324/9781003568544-11)

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and don't express genuine feelings of wanting students to succeed often create negative feelings within students that can lead to problematic behavior (Hawk & Lyons, 2008; Teven, 2007).

## Types of Behavioral Problems in the Classroom

There are many different types of classroom behavior problems. This is just a listing of some of the most common that can have a large effect on the teaching and learning process, which can affect both the student causing the issue and the students around them.

**Academic Misconduct (Cheating):** This can take many forms, such as using unauthorized material or looking at someone else's paper/screen during an exam, showing someone else their paper/screen during an exam, and having someone else or an artificial intelligence (AI) do one's assignment. This is a behavior issue in that time is taken away from real learning.

**Not Paying Attention (Including Being on Cellphone):** If a student isn't focusing (making eye contact, taking notes, answering questions) on the instruction, then they cannot learn. This includes things like playing on their phones, smart watches, or laptops, drawing, daydreaming, or working on another class. Note that some doodling is OK, but focusing completely on artwork instead of actively listening to the class is not beneficial (Boggs et al., 2017). Additionally, this type of problematic behavior often causes other students to lose focus.

**Not Wanting to Participate:** Many of us are introverts, but all students must develop the ability to actively participate in their learning and develop public speaking skills. Simply not calling on a student because they feel shy is doing a disservice to the student and not adequately developing them as a professional. All students need to participate in the class in order to fully establish an effective community of inquiry where all learn and develop through social learning and seek to help one another.

**Disruptive Behavior (including Talking Out of Turn):** Students can cause disruptive behavior in many ways to include talking with their classmates when it is not appropriate. Other actions include, making noises in other ways, wearing headphones, and other attention-seeking behaviors. This requires the instructor to take time away from the class in order to address the issue and causes other students to lose focus from the teaching event.

**Late/Tardiness and Not Turning in Assignments On-Time:** Time management is a big issue that students must develop. When students turn in

assignments late, they begin a pattern of putting classwork off to a later time and start to lose discipline in their studies. Similarly, students who show up late to class are putting other actions as more important and cause distractions when they enter the teaching environment after the instruction has begun. Yes, sometimes there are good reasons for time issues, but often this is a lack of discipline and a pattern of time mismanagement that students develop.

**Not Wanting to Speak in the Language of the Class:** In some situations, either in a special language class or at an educational institution that is in a foreign country but is conducting instruction in another language (such as an American University in another country where all the instruction is done in English but the language of the country is another language), some students try to revert to their native language.

## Behavioral Problem Solutions

The top two solutions dealing with behavior issues are prevention and to deal with the issue as soon as it starts instead of waiting until it becomes a much bigger problem (Karasova & Nehyba, 2023; McNaughton-Cassill, 2013; Sorcinelli, 1994). The following is a breakdown of different ways to implement these two solutions in order to prevent and address behavioral problems.

### *Preventative Measures*

Be clear with behavioral expectations, classroom rules, policies, assignment/assessment instructions, and rubrics. Write them out in the syllabus, go over them in class, and periodically remind students. This will help to ensure that students are fully aware of classroom norms and expectations.

Be a role model and display the behavior you want your students to display. Be genuine, students can tell if you truly care about them. This can be displayed in a multiple of ways, such as by learning students' names (this can be difficult in large classrooms, but even periodically calling students by their actual name can be impactful), following up with students if they miss more than one class in a row, providing personalized feedback, adjusting assignments or due dates when needed because of unforeseen circumstances or just to express compassion, learn about students' backgrounds and current interests to create more personalized examples in the classroom. Be approachable by expressing that you would be happy to meet with anyone before or

after class, or during office hours, smiling, and being encouraging in the classroom. By creating a positive environment and likable persona, students will be less likely to act out in a problematic manner.

Use hands-on student-centered learning pedagogies to increase student engagement. Use teaching and learning activities that draw in all students, present information in an organized, logical way that minimizes cognitive overload, maximize motivation (to include relevancy), and help students focus on the instruction. By using these types of active learning techniques, students will be more engaged in the learning and less likely to be bored or easily distracted.

### *Addressing Behavior Problems Immediately*

If a student is talking at an inappropriate time, make direct eye contact with the student to signal them to stop. If that doesn't properly send the needed signal, then properly escalate by moving closer to the student, calling on the student to answer a question, and finally directly addressing the student and asking them to stop the talking or distracting action. Purposefully decide if directly talking to the student about the issue should be done during class with everyone observing (and learning from the situation) or after class. Regardless, this needs to be done as soon as possible in order to prevent the issue from escalating into a bigger problem. Avoid becoming emotional, remind the student of the established policies, and explain the importance of active listening in order to properly develop and help everyone within the community of inquiry.

Immediately protect a student if another student starts to use disparaging/uncivil language. Remind everyone involved about the classroom norms/policies and that the class is a community of inquiry that is seeking to learn from one another. Your mission as the instructor is to ensure a safe and secure learning environment where everyone feels welcome to participate without the fear of ridicule or verbal abuse. It is vital to be impartial toward all students and not show favoritism otherwise additional disruptive behavior can occur. Students will see these types of fair, purposeful actions by you and act in a more appropriate way.

Inform students of the negative effects that result from their actions, such as being tardy to class or turning in assignments late (for example, participation points reduction and points taken off for late work). Do this as quickly as possible so that they can fully see and associate the cause and effect of their actions. Be supportive of this by expressing that you know that they can

improve. Express different ways that they can better manage their time such as by ensuring the use of a calendaring system and the setting of different alarms so as to be on time.

Note that virtually all of the solutions listed are aspects of instructional design that you have already learned by going through this book. By improving your understanding of proper course design and actual implementation of teaching, you will create a teaching environment that will, in itself, address and prevent most classroom behavioral issues. Having a properly aligned course, using active student-centered learning activities, ensuring high levels of motivation (by using the ARCS model of motivation), developing a good instructional presence (through the creation of a good community of inquiry), and knowing how to address any needed learning accessibility issues, your ability to prevent and address classroom behavior issues will be greatly enhanced. Additionally, remember that we also have very powerful AI as a tool to help us with any type of behavioral issue.

## AI Activity

Let's create a very realistic example of disruptive classroom behavior and analyze what the AI suggests, given what we have already learned in dealing with this issue. Go to your preferred AI, start a new chat session, and enter the following **prompt**:

Please assume the role of an instructional designer and university Spanish professor. I teach Spanish 101 and usually have a class of 25 male and female freshmen and sophomores. It is the second week of class and I seem to be having a lot of behavioral issues in class. Lots of student come in late, many have been turning in their weekly assignments late, I constantly have to tell students to put their phones away, and some students don't want to participate (speak in Spanish) in class. Please give me some recommendations on what I can do to improve these student behavioral issues. I very much care about all of my students and want them to improve their Spanish speaking skills so that they can develop and use this language even beyond graduation.

The results of the AI (in this case, Claude AI was used) were very impressive, with highly usable recommendations presented for each area prompted. It gave similar recommendations as those already expressed in this chapter

based on already referenced research, as well as some additional ideas. The following is a summary of those **additional** recommendations:

### **General Classroom Management**

- Hold a reset discussion about expectations and why they matter for language learning [this is a very impressive recommendation that I had never heard of, but it makes a lot of sense; simply have a “reset” discussion to address the issue(s)].
- Connect behavioral expectations to real-world professional skills they’ll need.
- Consider implementing a simple points or badge system to recognize positive behaviors.
- Use varied activities (no more than 15–20 minutes on any one activity) to maintain engagement.
- Create opportunities for student choice and agency within the curriculum.

### **Address Tardiness**

- Begin each class with a high-value activity (like a quick conversational exercise worth points) that students won’t want to miss.
- Acknowledge and thank students who arrive on time.

### **Late Assignments**

- Send reminder emails or use your LMS (Learning Management System) to alert students about upcoming deadlines.

### **Phone Usage**

- Create a physical “phone parking lot” at the front of the room.
- Explicitly connect phone-free time to improved language acquisition.
- Model the behavior by keeping your own phone away.

### **Participation**

- Start with low-pressure speaking activities in pairs before asking students to speak in front of the class.
- Implement a participation rubric so students understand expectations.
- Create a supportive environment where mistakes are normalized and explicitly celebrated as learning opportunities.
- Incorporate culturally relevant materials that engage student interest.
- Use language games to make speaking fun rather than stressful.

As you can see, these AI results were highly useful and were personalized to specifically address the issues in our Spanish course. You would simply need to modify the initial prompt to address your class specifics and the issues you might be having. Additionally, remember that we can have an ongoing conversation with the AI to gain further understanding or for clarification. Let's continue with this Spanish class example to get more details to further address one of our issues. Since this is a continuation of our AI interaction, you do not need to start a new chat session; just continue to **prompt**:

I really like your ideas of addressing tardiness by beginning "each class with a high-value activity (like a quick conversational exercise worth points) that students won't want to miss." Please give me more information on how I can do this in my class. Give me a step-by-step plan and an example of how this would work.

The AI results were again extremely helpful with great detail. It highlighted a need to properly explain the new activity that would be happening at the very beginning of each class and to update the syllabus with this information and any change to how students would obtain participation points toward their final grade. It then gave step-by-step instructions on how to set it up, with recommendations to adjust difficulty levels, and evaluate how well it was working (both to help develop students and address tardiness). The example provided was also very useful.

### *"Pregunta del Día" (Question of the Day) Rotation*

#### **Preparation**

- Create a slide with the day's question and display it as students enter.
- Include 4–5 vocabulary words they should incorporate.

#### **Execution**

1. As class begins, announce: "¡Buenos días! Tenemos nuestra Pregunta del Día. Tienen cinco minutos para discutir." (Good morning! We have our Question of the Day. You have five minutes to discuss.) Students pair up with whoever is present and discuss the question using target vocabulary
2. Example question: "¿Qué haces los fines de semana? Usa estas palabras: siempre, nunca, a veces, me gusta, prefiero" (What do you do on weekends? Use these words: always, never, sometimes, I like, I prefer)

3. After 3–4 minutes, randomly call on 2–3 pairs to briefly share their conversations.
4. Award participation points to all on-time students (two points per activity).
5. Transition to your main lesson: “Gracias por sus respuestas. Ahora, vamos a continuar con nuestra lección de hoy sobre ...” (Thank you for your answers. Now, let’s continue with today’s lesson on ...)

### Benefits

- Students who arrive on time get easy points.
- Latecomers immediately see what they’re missing.
- The whole class warms up with relevant Spanish practice.
- You establish an energetic, Spanish-immersive environment from the start.
- Students form connections with different classmates each day.

This is a useful and powerful example of how AI is able to incorporate many different aspects of instructional design to provide personalized and detailed assistance with behavioral issues in the classroom while at the same time also enhancing the pedagogical approach. Also, remember that we only need to adjust the specifics given in the prompt to address different issues or varied aspects, such as conducting a face-to-face course versus an online course or a synchronous versus an asynchronous course.

### Summary

This important chapter covered needed information dealing with classroom behavioral issues. Behavioral issues are something that all faculty will eventually have to deal with. This chapter explained what educational behavioral problems are, why they are important to understand, what tends to cause these issues, and how to properly and effectively deal with these issues. Key aspects of prevention and addressing the issues as soon as they manifest were also highlighted. Additionally, using AI was also emphasized as an important tool that can be used to assist in coming up with effective and sometimes novel ways of best addressing the issue(s). Note that the greatest power in using AI comes from first becoming highly knowledgeable on a specific subject (such as through reading this book) and then using AI as an enhancement tool to accomplish even more.

AI is already such a powerful and useful tool for both faculty and staff (as well as all people), yet it continues to develop. The future of AI is an important issue for us in academia to be aware of for a multiple of reasons. The final chapter of this book expresses logical developments that will occur within AI as well as predictions as to how it will develop (both in the short and long term) and what that means for education.

## The Future of Teaching Jobs

Back in May of 2024, right after OpenAI released their powerful GPT-4o AI model, I created a video titled “Since We Have AI Are Teachers Obsolete?” (<https://youtu.be/8yDpvQmgwok>). The key message from that video, which I still stand by, is that we, as a society, will always need *good* teachers. The key word is of course is “good.” Even before generative artificial intelligence (AI) was released into the world, teachers who weren’t excellent should have been replaced with videos. I say this in that educators who don’t engage students and simply lecture the entire time are actually worse than a video. At least with a video the student can play it faster, slower, or even pause when needed. Additionally, with a video, a student can watch it as many times as needed and can turn on closed captions if needed.

The reality is that AI will continue to improve and replace some instructors, especially those that don’t offer enhanced value. A good education should be much, much more than simply providing information. We have had access to virtually unlimited information since the mid-1990s with widespread access to the internet, libraries, and inexpensive books and magazines. In the future, the only faculty that will remain are those that provide a much greater experience for their students by maximizing human connection and psychological aspects that go beyond what an AI can do now as well as into the future.

Yes, AI will continue to become much more human-like, but it won’t actually be human. We, as “good” teachers, must make sure that we continue to develop key human aspects within our teaching to ensure that our students develop a real connection with us and the teaching and learning journey. This then begs the question of what those key human aspects are to develop within ourselves and our teaching. The great news is that we have already covered it in this book, in that it is part of excellent instructional design.

DOI: [10.4324/9781003568544-12](https://doi.org/10.4324/9781003568544-12)

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We talked about making our instruction student-centered, which requires us to think of students' needs and to use empathy and emotional intelligence. We need to be able to put ourselves in our students' shoes, assume their perspectives, better understand their cognitive processes, their issues, and concerns while going through the learning journey. This means that we have instructional presence and present ourselves as real people who genuinely care about our students and are approachable so that they can be free and willing to express themselves and connect with the content and one another as they display the skills they are learning while achieving deep transformative learning.

We learned that by achieving a better emotional connection with our students, we develop a community of inquiry where education is enhanced through social learning by engaging not only with the content but with one another as well. Through our enhanced interactions, we create a positive and personalized learning environment where students' motivation to learn is greatly enhanced, leading to educational success. This is the power that we must continue to develop as "good" teachers. This is the power that AI can't fully replicate and why good teachers will need to remain as the human-in-the-loop, with the ability to create a personalized, student-centered, positive community of inquiry, with enhanced motivation, all from being an approachable, genuine teacher with full instructional presence.

## AI Agents

AI Agents, autonomous AI systems capable of learning and performing multistep tasks, taking actions across different websites based on initial instructions, will continue to increase in capability, autonomy, and ease of use. These AI agentic capabilities will be able to do more and more jobs and processes to include working together with other AI agents and systems. This will have major implications for different parts of the economy (good and bad) and will allow faculty to create increasingly complicated and powerful personalized educational experiences for students at a fraction of the time and energy currently required. This will first take the form of an AI Agent helping with administrative tasks (scheduling, attendance, etc.) and then move on to more complicated aspects such as grading, content personalization, course design, and direct student support (Uspenskyi, 2025).

I believe AI Agents will take two forms; one will be through continued enhancements to regular AI interfaces such as within ChatGPT, Claude, and Grok. An example is the enhanced capabilities of using AI with reasoning

or deep research modes. The second will be with much more advanced and precise AI Agents designed specifically to address certain tasks or jobs. An example of this would be an AI Agent that could handle any type of customer support issue (in the same way, imagine an AI Agent that could handle any type of student support issue in either text or audio, if not even video form).

Bret Taylor, OpenAI chairman, expressed his thoughts on the importance of this developing technology, “I think [for] most companies, AI agents will actually be as significant as their website or their mobile app in terms of the percentage of interactions they have with their customers,” additionally, “... if you fast-forward five or 10 years, their AI agent is their main digital experience, which I think is kind of hard to imagine right now. But I really do think that’s where the world is going” (Lomas, 2025, para. 11).

AI Agents will continue to gain in popularity and will enhance as AI improves overall through new discoveries and increasing competition locally, within the United States, and internationally, such as from China (Kell, 2025; Smith, 2025a). Academia must continue to be aware of these ongoing advancements in order to fully use AI Agents to our advantage and to fully prepare students to use and manage this technology to remain relevant in the workforce and succeed in efficient research and other developmental efforts. As AI expert and best-selling author Sol Rashidi states in writing for *Forbes*, “The future of AI isn’t just smarter chatbots – it’s fully autonomous AI agents that anticipate needs, execute tasks, and continuously learn from interactions” (2025, para. 31).

## Hyper Personalized

All aspects of AI will develop greater personalization capabilities in that AIs will be able to remember past interactions and will even be able to (if allowed) connect with personal social media, email/messaging accounts, and more for even greater (hyper-aware) personalization of its system allowing the AI to know you more completely and/or create content using your voice (both figuratively and literally) and viewpoints (Adorno, 2025; Amazon, 2025; Jiang et al., 2024; Smith, 2025b; Wilkins, 2025). This could take on different forms, such as the creation of a digital twin of you or an AI assistant/friend that is perfectly in tune with your likes and dislikes and who you really are.

A digital twin would be a powerful way to expand one’s capabilities as well as to retain a version of one’s self. Imagine being able to ask an AI to recall something from long ago that you did, or to ask it questions, bounce ideas on what should be done at any time for any given situation. This could

provide deeper insights into one's self since you would be talking to a digital twin version of yourself. Other possibilities include having your digital twin attend meetings or classes and then report back to you. The digital twin could answer questions based on your knowledge since it would have been trained on your understanding and experiences. This ties in with ongoing efforts to create digital twins of everything in our real life in order to enhance predictive modeling, weather forecasts, engineering/business designs, and even societal shifts in consumption and marketing (Busch, 2025; Charles, 2024; Frank, 2025; Szatar, 2025).

The future creation of a hyper-personalized AI assistant/friend designed specifically for you could also offer a multiple of benefits in different ways. It could be designed in a similar way to a digital twin of you or it could be structured differently to augment your understanding or abilities. There would also be psychological differences in making an AI specifically to serve as an assistant or friend as opposed to a digital twin. This AI assistant friend could have agentic qualities in that it could accomplish real multistep tasks, conduct research, or help with idea generation and fine-tuning, all through a life-like conversational AI with a real unique personality designed to give you maximum enjoyment and connection.

## Virtual Reality and Augmented Reality

The combination of virtual and augmented reality with AI shows limitless potential for many industries and organizations, and will have a powerful and important impact in education. Initial efforts incorporating AI integration with virtual reality have just now started (with promising results) in areas such as math, medicine, language learning, professional communication, engineering, and more (Ahmad & Rana, 2025; Almeman et al., 2025; Temple, 2025). This will continue to advance and become easier to use while also becoming less expensive to develop and employ.

Companies such as Convai, Fectar, and Virti have started to develop programs to allow for the development of educational virtual reality simulations/scenarios that incorporate non-playable characters (NPC) that are enhanced with AI, allowing for dynamic interactions but focused within the intended purpose of the learning event (Convai Team, 2024; Fectar, 2025; Virti, 2025). Ease of use and lowering of costs will make these solutions a real possibility in the near future, which is important to ensure that we continue to properly develop our students through enhanced instructional design, leading to better teaching and learning experiences.

In a recent article by Bojan Ciric and Prakul Sharma, executives from Deloitte, deep research and analysis consulting group, the importance of the development of a future workforce where virtual reality is used to help humans and AI work together effectively was highlighted:

Picture a human donning a pair of VR glasses and seeing a table full of coworkers ready to meet. Each is a gen AI program with a face, voice, and distinct personality. Each “agent” can provide status updates, ask questions, strategize, and—unlike humans—instantly present complex data visualizations and adjust them in real time. By combining an AI team-of-specialists approach with spatial computing, each human could be put in charge of a team of AI agents that they can chat, email, and hold virtual meetings with. While still on the horizon, this combination of technologies may enhance efficiency, collaboration, system resilience, and task-specific optimization once it arrives, leading to better performance and problem-solving capabilities.

(Ciric & Sharma, 2025, para. 2)

## Experiential Learning

Ongoing developments with AI-infused virtual reality and augmented reality are just one way that education, as a whole, will continue to move toward more experiential learning pedagogical approaches. Higher education will focus more on experiential learning through role-play, scenarios, project-based learning, and student-led community outreach programs, along with a greater emphasis on internship or other programs (examples: integrated, required work experiences as well as apprenticeship models) designed to give students real lived work experiences. An example of this can be seen at Penn State, which requires its students studying in the College of Information Science and Technology to go through an internship in that field (Penn, 2025).

This move to increase experiential learning is necessary in order to ensure that education (higher education specifically) remains relevant in a world where knowledge and a personalized tutor will be at everyone’s fingertips through the use of AI. Because AI will be able to easily handle entry-level positions, we in higher education will need to develop students so that they are able to enter the workforce at a higher cognitive and ability level than ever before.

An article in *Inside Higher Ed*, when predicting the future of AI in higher education highlighted the importance of experiential learning by stating, “AI will ultimately elevate higher ed. Institutions that embrace AI’s changes with

foresight and care will enhance their competitiveness, improve operational efficiency and create more meaningful experiences for students and staff alike” (Willsea, 2025).

More and more research is coming out talking about the importance of experiential learning in general and as an vital need in an AI world (ISC, 2025; Jordan & Matzke, 2025; Scheuring & Thompson, 2025; World, 2024). This is also well expressed in an article in the *Financial Times*, “Business schools are redefining their approach to education — embracing new ways to equip future executives for a rapidly changing world. ...academics are reimagining curricula by integrating sustainability, experiential learning and advanced technologies to tackle global challenges” (Espinoza, 2025, para. 1). The article additionally quotes Eric Cornuel, president of the European Foundation for Management Development Network Association, and one of several judges for the Responsible Business Education Award, when talking about the course winner, that it “... breaks away from the idea that learning takes place by presenting the material to be studied, from the outside, ... learning is best achieved by experiencing situations” (Espinoza, 2025, para. 27).

## AI Humanoid Robots

Advanced AI humanoid robots will become more usable and prevalent throughout our society, in business, in the home, and even in education. Note that we are talking about advanced robots that are designed to be human-like: can walk around, talk, and fully interact with people and the world around them (examples include the Tesla Optimus and the Unitree humanoid robot). This will have a big impact in the world of education in multiple ways, such as teaching assistants or remote embodiment for faculty, and learning companions or physical/developmental support for students.

Faculty will start to use AI-infused humanoid robots in the classroom by having them help with classroom activities as a teaching assistant. This will be possible due to increasing development and competition in the humanoid robot market, making the actual hardware (the humanoid robots themselves) cheaper and cheaper, ranging from \$16,000 to \$30,000 with prices expected to continue to decline (Batch, 2025; Econo, 2025). This is a positive development in that preliminary research in the use of humanoid robots in education have shown favorable and even enjoyable outcomes (Lampropoulos, 2025; Tilden et al., 2024). AI-infused humanoid robots will be used in the classroom in other ways as well.

Many different parts of the world face crucial teacher shortages that could be addressed, at least in part, through the use of tele-operated AI-infused humanoid robots (Arnold & Rahimi, 2025; Bowen, 2025). In the past, there

have been many complexities in properly controlling humanoid robots, but thanks to greater AI developments, this type of implementation is becoming increasingly possible and accepted (Ben et al., 2025; Huang et al., 2025; Kasuk & Virkus, 2024; Kawahara et al., 2024). The use of AI-infused humanoid robots will also be realized by students.

As the price of these humanoid robots falls, individuals (like students) will also be able to purchase robots and will start to use them as learning companions as well as supportive/assistive devices. Preliminary research in the field of humanoid robots as learning companions have also shown favorable results across all levels of education (Ekström et al., 2025; Lampropoulos, 2025; Pai et al., 2024; Pande et al., 2024). Even greater positive effects have been found when studying the results of the use of humanoid robots as learning companions among students with special needs (Baksh et al., 2024; İnan & Güldenoğlu, 2025; Lampropoulos, 2025). For this reason, more and more students will start to have and use AI-infused humanoid robots as assistive devices or specialized companions on their learning journey.

## New Issues

There will also be multiple special new issues that academia will need to address as AI technology continues to advance at an ever-increasing rate. Two key issues will be teaching students in a world where there will be fewer and fewer jobs as AI becomes much more capable and helping students navigate issues pertaining to appropriate relationships with AI and AI-infused humanoid robots. Both of these issues have unspecified time-tables and will have macro and micro effects on academia as a whole, but will ultimately be issues that individual faculty will need to address.

The World Economic Forum's Future of Jobs Report: 2025, expresses an overall favorable view of jobs development, even with the development of advanced AI. The report specifically states,

... macrotrend-driven creation of new jobs is estimated to amount to 170 million jobs, equivalent to 14% of today's total employment. This growth is expected to be offset by the displacement of 92 million current jobs, or 8% of total employment, resulting in a net growth of 78 million jobs (7% of today's total employment) by 2030.

(WEF, 2025, p. 18)

Although this is a sentiment shared by many American economists, I do not believe they are fully taking into account how AI is affecting all businesses

and organization as well as how AI-infused robots will drastically affect the labor market (Rosalsky, 2025; Sovorel, 2025). In fact, other research and reports from Bloomberg, Goldman Sachs, and others point to growing job cuts due to AI in banking, computer programming, and other sectors (Bonfiglioli et al., 2025; Lin, 2025; Shaw, 2025; Tangermann, 2025). Fewer employment opportunities is the obvious result when we consider AIs continued advancement and agentic qualities. As AI learns how to do more and more tasks with greater accuracy and capability, it will take over more and more jobs, resulting in fewer job vacancies for real people (George, 2025; Stiefenhofer, 2025).

Faculty will need to help students understand that employment will become harder and harder to obtain making it much more important to not only develop hard skills in a chosen field, but also soft/power skills (critical thinking, creativity, and a multiple of professional communication skills) and of course AI literacy and AI skills specific to the job. Yet there should also be a renewed understanding that obtaining a degree is purposeful beyond employment. It is also valuable in regard to personal growth and understanding and to ensure a capable civil society. Students will also need to develop a growth mindset of continual learning where needed skills will require adaption and development on an ongoing basis.

A final prediction and new area that teachers, professors, and instructors will need to be aware of and understand deals with different types of relationships that students will inevitably develop with their AIs and/or AI-infused humanoid robots. Students will start to become close friends with AIs in that they will become more personalized and will start to better know the individual. Additionally, AI will become more customizable, allowing for specific looks via avatars (photos/video) and even voice selection. Through interactive devices such as one's cellphone, smartwatch, AI pendants/necklaces, or glasses (such as Ray-Ban Meta smart glasses) students will be able to have an always-on connection with their AIs so that the AI is always seeing and hearing what is being lived. With so much connection, personalization, and multimodal interaction, students won't be able to avoid anthropomorphizing (humanizing) their AI.

Initially, you might think that this is some fringe, sci-fi scenario that is a long way off, but, "Close to 20% [over 60 million] of Americans have explored using AI designed for companionship" (CivicScience, 2024). Additionally, the market size for AI companions/friends is quickly growing and is expected to virtually double in less than ten years (BRI, 2025). Although ChatGPT is widely used by most students in general (even as a friend), many faculty are unaware that an extremely popular AI for students is Character.ai, which allows for a more personalized, friend-like experience so as to be more of a companion when learning, doing homework, research, seeking counseling,

avoiding loneliness, or just seeking conversation (Cloudflare, 2025; Pazur, 2025; Tidy, 2024). Developing friendships with an AI is one thing, but many are going even further.

Romantic relationships with AI are also on the rise with the term “virtual girlfriend” increasing by 500% year over year, and 40 to 60% (60% male, 40% female) of those surveyed expressing that they would consider dating an AI partner (Blackbym, 2025; Greco, 2024; Shalwa, 2025). An article by Anna Duane, Director of the Humanities Institute, University of Connecticut, reported that “Young people are reporting epidemic levels of loneliness, and some are turning to technology to fill the void” and that “These teens were among the tens of millions of people who use AI chatbot companions, a number that market forecasters expect to dramatically increase by the end of the decade” (2025, para. 1&3). These are issues that could easily spill into the classroom and are areas that we as faculty need to prepare students to properly address.

Although there are benefits that can be obtained from advanced relationships with AI (social development, aspects of helping with loneliness, assistance with some issues), there are important negative aspects that could arise in these types of relationships that faculty need to be aware so as to help students. Possible negative issues include: data privacy and security, unhealthy attachments (emotional dependency), AI hallucinations (AI still isn’t perfect, so misinformation is still a possibility), social stigma (although growing in popularity, many might adamantly oppose this type of relationship), and unintended manipulation (the AI might be customized to be negative, domineering, or excessively emotional based on customization settings) (AW, 2025; Raedler et al., 2025; Wu, 2024).

These predictions and issues might seem extreme or unsettling, but remember that you have now gained a much greater understanding of instructional design and how to use AI as a tool to help you in virtually any teaching and learning situation. As these predicted issues arise, properly use the AI to help you deal with these and unforeseen events and developments. Remember the power of the advanced prompt formula (learned as part of AI Literacy) to better achieve effective, usable advice and recommendations no matter what the future holds.

## Summary and Call to Action

This important chapter covered needed information dealing with predictions of AI in education within the next five to ten years. Important issues dealing with the Future of Teaching Jobs, AI Agents, Hyper Personalization, Virtual/

Augmented Reality, Shifting to Experiential Learning, AI Humanoid Robots, and New Issues to Consider were presented. These are all possibilities that could face us in academia within the next five to ten years. It is important for us to be observant and proactive with these issues to be prepared and ready for challenges and opportunities in our great field of teaching and learning. To properly achieve this, action is needed.

My call to action for all of us is to be a role model for our students and show them how to succeed. We must all continue to have a growth mindset and be life-long learners as AI technology changes and advances. We must be ready to critically analyze new AI developments and implementations and see how they might be used within our own courses. We must continually self-develop by reading books like this, watching YouTube videos on AI in education (leaving comments and being part of the discussion), and attending conferences and workshops. We must develop our own community of inquiry where we discuss, debate, and question AI and pedagogical approaches to ensure that we are doing everything we can to create the best educational experience for everyone involved.

Reading and engaging with this book is a powerful step toward being the needed role model not just for students but for other faculty as well. Students must develop AI literacy, and our instructional practices must remain relevant and impactful. The best way to do that is through the use of AI in effective and proper ways with teaching and learning. By learning about instructional design and how AI can be used to enhance this vital process, you have become this inspirational role model and are an example for others (both faculty and students) to follow to ensure success both now and into the future.

Thank you so very much for taking the time to explore this book and truly deepen your expertise in instructional design with AI. By integrating these insights into your teaching and learning process, you are actively shaping the future of education and empowering students to succeed in an AI-driven world. Keep learning, keep leading, *'and remember, learning is for life!'*

Sincerely,  
Brent A. Anders, PhD

# Additional Resources

## Video Resources

*The Sovorel Center for Teaching & Learning YouTube Educational Channel*

<https://www.youtube.com/@sovorel-EDU>

This channel is updated regularly with information dedicated to artificial intelligence (AI) in education and often addresses specific aspects of instructional design. There are already over 200 videos available with a special playlist for AI literacy as well as for instructional design.

## Books

*9-Point Action Plan: for Generative AI Integration into Education*

<https://www.amazon.com/Point-Action-Plan-Generative-Integration-ebook/dp/B0D183M85K>

This useful guide provides step-by-step instructions to help any educational institution go through the very needed process of integrating AI into education. The 9-point action plan provides detailed examples and explanations of what is needed to help develop the best path possible to ensure that any intuition is ready to effectively use AI and develop students and everyone else needed to ensure success.

### *The AI Literacy Imperative: Empowering Instructors & Students*

<https://www.amazon.com/AI-Literacy-Imperative-Empowering-Instructors/dp/B0C51RLPCG>

This is an excellent work that fully explains the different aspects of AI literacy and how to teach them to students. A large body of research and experience is used in order to provide the necessary background and understanding of this vital subject that is needed by all faculty and students.

### *Teaching with AI: A Practical Guide to a New Era of Human Learning*

<https://www.amazon.com/Teaching-AI-Practical-Guide-Learning/dp/1421449226>

This book provides great descriptions on how AI is drastically affecting education and business. It provides specific information on using AI to create advanced assignments and assessments using interactive strategies. It provides useful and practical information to enhance teaching and learning and address issues such as academic misconduct.

## Websites

### *The Sovorel Center for Teaching & Learning Blog*

<https://sovorelpublishing.com>

This is a very useful website with many infographics, AI prompts, and articles specially talking about different aspects of teaching and learning to specifically include instructional design.

### *Inside Higher Education*

<https://www.insidehighered.com>

This is a general academic website that covers information dealing with different aspects of education. This is a good website in that they regularly address important issues dealing with AI and instructional design.

## *The ELearning Designers Academy*

<https://community.elearningacademy.io/c/knowledge-base>

This site has multiple guides, articles, templates, and even some how-to videos, on how to enhance different skills and processes in instructional design. They also periodically discuss different aspects of AI in teaching and learning.

## **Additional Considerations**

### *Join Your Center for Teaching & Learning*

Become a professional and even leader in this field by seeking to work with your educational institutions Center for Teaching & Learning. If your educational institution doesn't have one, start one. It could just be done online to begin with, but meet with people and learn from one another. If your educational institution has a library, be sure to include them too.

### *Join a Community of Inquiry*

Be part of a community of inquiry with instructional design and AI. Join groups and organizations dealing with this important topic. I cordially invite you to subscribe to my educational YouTube channel (<https://www.youtube.com/@sovorel-EDU>) and actively comment to my videos as well as to connect with me on LinkedIn (<https://www.linkedin.com/in/brentaanders>). We regularly discuss different issues with AI and instructional design and would love to have you join us. We are all much stronger and capable when we are able to learn from one another.

# Glossary

**Advanced Prompt Formula** The incorporation of specific components (Task, Instructions, Context, Reasons, and Clarification) when creating a question/task for the artificial intelligence (AI).

**AI Agent** An autonomous artificial intelligent system capable of learning and performing multistep tasks, taking actions across different websites, based on initial instructions/goals.

**AI Literacy** "... a set of competencies that enables individuals to critically evaluate AI technologies; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace" (Long & Magerko, 2020, p. 2). AI literacy is also generally considered a part of digital/media literacy.

**API (Application Programming Interface)** Standardized rules and protocols that allow different software applications to communicate and interact with one another. This allows for a uniform method for programs to request/exchange data.

**Artificial Intelligence** A field of study as well as a computer system (code and algorithms) purposefully designed to perform, create/act, reason, and learn, as it simulates a human mind and its intelligence capabilities (Google, 2024; IBM, 2024).

**Backward Design** A needed requirement in order to achieve constructive alignment within a course. Backward Design is achieved by first looking at

what the intended end goal is, what specifically are students to learn, and then use that to create the necessary teaching/learning activities and assessments.

**Behavioral Issues** They (in the classroom) are defined as any action(s) by the student that distracts the faculty member or other students, as well as student actions that deter from successful teaching and learning.

**ChatGPT** “A Large Language Model (LLM) developed by OpenAI that uses natural language processing to generate human-like text based on input. It is part of the GPT (Generative Pre-trained Transformer) family and is designed to handle conversational tasks, such as answering questions, generating dialogue, or assisting with writing” (ChatGPT, 2024).

**Cognitive Overload** Within a learning experience, this is when a student is presented with too much information or stimuli, leading to feelings of over-saturation, not being able to properly process the topic being presented or the experience. A simple example would be when an instructor presents too much information on a presentation slide all at once. At this point, many students would feel overwhelmed with the information (cognitive overload) and simply shut down, zone out, or choose to not pay attention because it is just too much to handle at that time.

**Course Alignment** The need for the three main aspects of a course (learning objective/outcomes, teaching/learning activities, and assessments) to be properly aligned or in support of one another.

**Deepfake** “An image or recording that has been convincingly altered and manipulated to misrepresent someone as doing or saying something that was not actually done or said” (Merriam-Webster, 2024).

**Deep Learning (in academia)** Refers to the development of deeper meaning and understanding as opposed to only obtaining surface-level or superficial knowledge, such as what would be obtained through a simple search engine or quick AI search.

**Deep Learning (in AI)** A form of machine learning that is able to recognize and understand complex patterns and make connections/associations in a similar way to humans (via neural networks). Its capabilities can include creating images/video/audio, identifying items in a photo, understanding voices, or controlling a robot/vehicle. A deep learning model is a computer

program that exhibits intelligence, due to its complex and sophisticated data processing abilities.

**Fixed Mindset** A belief that one's abilities and capabilities (intelligence/talent) are fixed and cannot be changed or improved regardless of effort. The opposite of a *growth mindset*.

**Formative Assessment** An evaluation or assessment that is typically done with low stakes (low points or no points), such as just participation points, that helps students prepare for the final summative assessment by providing an opportunity for practice and feedback so that students can understand their current level of proficiency and know what to do to improve. Formative assessments should be similar to or have an aspect of how the summative assessment will be conducted. As an example, if the summative assessment would be a written exam, then some formative assessments should have written components similar to the final summative assessment.

**Foundational Model** A large-scale base (foundational) machine learning neural network model that other varied applications can use to accomplish different tasks (this can be multimodal). These are unique, original models created by a specific group, company, or organization.

**Growth Mindset** A belief that both your intelligence and talents can be greatly improved over time through effort and hard work. With this mindset, an issue or problem in one's life is viewed as a challenge to overcome, not as an impenetrable or unsurmountable obstacle. The opposite of a *fixed mindset*.

**Guardrails** The use of different policies, filters, and/or frameworks to help ensure that an AI will operate within legal and ethical boundaries to prevent harm, misuse, illegal activity, and/or biased decision-making.

**General AI (strong AI)** A theoretical concept of an AI that could utilize prior learning to accomplish new task without the need for human-lead training. It would be self-learning, fully adaptable, and could function on the same intellectual level as a human being.

**Generative AI** A specific sub-type of AI that allows for normal conversational-type interaction by a user via regular text, audio (spoken instruction), visual commands, or other means (ex. combination such as text + image prompting/questioning). This generative AI can then respond in a human-like way to the

user via multimodalities such as text (essays, reports, computer code, poems, scripts, etc.), images, or audio/video (Baidoo-Anu & Ansah, 2023).

**GPT (Generative Pre-trained Transformer)** This is a type of deep learning large language model, originally created by OpenAI, that uses transformer architecture to create human-like text (conversational text) based on submitted prompts.

**Hallucinations** The creation of text or information that is inaccurate or nonsensical but confidently presented as if it were correct. This can sometimes occur if the AI model has incomplete or ambiguous information to provide a factual/valid answer but still provides a plausible-sounding answer.

**Large Language Model (LLM)** A type of foundational model that specifically focuses on natural language processing. This AI model has been trained on a large amount of textual data and is designed to understand, generate, and manipulate human conversational language.

**Machine Learning** A field of study within AI that deals with training algorithmic models to understand and learn statistical patterns from data. With machine learning, these models are able to learn from databases/datasets instead of being directly programmed by a human to perform a task/process (such as decisions or predictions based on identified patterns).

**Mindset** One's view and attitude towards things and way of approaching issues/problems. Often divided into two mindsets: fixed or growth. A fixed mindset is a belief that one's abilities and capabilities (intelligence/talent) are fixed and cannot be changed or improved regardless of effort. A growth mindset is a belief that both your intelligence and talents can be greatly improved over time through effort and hard work. With this mindset, an issue or problem in one's life is viewed as a challenge to overcome, not as an impenetrable or unsurmountable obstacle.

**Motivation** The process that initiates, directs, and sustains learner behavior toward achieving an educational goal; the emphasis being not just about arousing interest but also about maintaining focus and engagement while fostering persistence in learning (Keller, 1987).

**Multimodal AI** An AI that can understand content beyond simple text input and output. This could include different capabilities such as creating images,

audio, or video. This could also encompass the ability to process and interpret via means beyond text such as in understanding audio, images, and video.

**Narrow AI** (*weak AI*) An AI trained to perform a single or narrow task. This is the only type of AI that actually exists in the world at this time. Even advanced multimodal AI's like used by OpenAI's ChatGPT are still considered Narrow AI because it cannot function beyond what it was specifically trained on and doesn't meet the threshold of General AI.

**Natural Language Processing (NLP)** A field of AI which focuses on the interaction between natural (conversational) human languages and computer languages. It specifically deals with computers' ability to understand, interpret, and then create human language in a useful way.

**Needs Assessment** The identification of skills, qualities, or understanding needed, along with the development of priorities required for improvement along with an allocation of needed resources. It is also the identification and explanation of issues and problems to be addressed.

**Neural Network** A machine learning model inspired by the structural nature of the human brain. It is made up of interconnected nodes (neurons) that processes/learns patterns that emerge from data provided. It then adjusts internal parameters (weights) to make predictions and/or classifications by recognizing the complex patterns from the inputs provided.

**One-shot Prompting** A prompting technique where you provide an example of what you are wanting the AI to do, within the prompt to the AI. This could be done via the prompt input or as an attachment.

**Praxis** This is the actual practical use and implementation on knowledge as opposed to theoretical knowledge. In education, both are important for understanding and skill utilization. To better use a skill (praxis) and firm understanding (theory) is needed.

**Prompt Engineering** The ability to effectively ask questions and pose tasks to generative AI in a more sophisticated manner by using techniques such the implementation of an advanced prompt formula.

**Scaffolding** Assistive processes or tools (such as reading outlines, templates, checklists, etc.) that are often temporary to help students accomplish and learn more. This ties in with Vygotsky's Zone of Proximal Development

in that it helps students to learn and develop, pushing them to comprehend more and then being able to do/understand without the use of scaffolding.

**Student Learning Outcome (SLO)** The first main aspect for consideration in course alignment, student learning outcomes, are what students are to be able to learn/accomplish by the end of the instruction. SLOs are designated as the first consideration in that the use of backward design is stated as a needed requirement in order to achieve constructive course alignment. The intended end goal is looked at first and then that is used to base teaching/learning activities and assessments. SLOs are nested within higher levels of the educational organization's structure to ensure that the student learns all needed components of their degree/specialty.

**Summative Assessment** This is the culmination assessment (after formative assessments) done at the end of an instructional unit or at the end of a course (multiple summative assessments as opposed to just one final summative is recommended). These summative assessments are meant to provide an evaluation and evidence as to what the student has learned/accomplished with regard to the SLO.

**Super AI** (*artificial superintelligence*) Another theoretical concept of an adaptable AI that could "... think, reason, learn, make judgements and possess cognitive abilities that surpass those of human beings" (IBM, 2023, para. 9). Its capabilities would be beyond human understanding and could even achieve emotions, with its own beliefs and desires.

**Transformer Architecture** A neural network with an understanding of context that leads to overall meaning through the tracking of relationships in sequential information/data like the different words in a sentence, paragraph, etc.

**Transformative Learning** This generally means that a student has had an awakening of sorts by expanding their consciousness (enhanced world-view) through a great realization, discovery, or skills development while going through the educational process.

**Zero-shot Chain of Thought** A prompting technique that generally improves an AI's performance by adding a phrase such as "let's think step by step" to a prompt. This allows and encourages the AI to logically reason through the task or question provided, even without examples. This is now a standard aspect of AI "Reasoning" process that is built into many newer AIs.

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