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AI Hacks for Educators

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50+ Ideas

AI HACKS FOR EDUCATORS

Practical Tips to Save Time by Using GenAI

created by educators, for educators

Kevin Yee * Laurie Uttich * Eric Main * Liz Giltner

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50+ Practical Tips for Faculty to Save Time by Using GenAI

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To our families.

As many authors will tell you, every work is influenced and aided by many more people than the authors directly. Several friends and faculty colleagues helped us find and explore individual AI tools, including **Dexter Hadley**, **Bill Zanetti**, **Richard Hofler**, **Patsy Moskal**, **Wendy Howard**, **Rebecca McNulty**, **Rowan Jowallah**, and **Lily Dubach**.

As interest in AI grows, so too does the mushrooming network of faculty support. This past year has seen the creation of FALCON, the **F**lorida **A**I **L**earning **CON**sortium, which includes many support offices from campuses around Florida's higher education landscape, in addition to many frontline faculty. There have also been multiple groups on the UCF campus sharing ideas and resources about AI. The work from both groups is reflected here in these pages, and we owe our thanks to all of them.

We are indebted to **Lee Dotson** at the UCF Libraries for hosting this and other open source e-books at the UCF STARS repository.

Finally, we are grateful to the members of our leadership team at UCF who supported this journey, including Provost **Michael Johnson**, Vice Provost **Jana Jasinski**, and Dean of the UCF Libraries **Beau Case**.

Introduction

This book, our second in as many years about Generative AI (GenAI), is a result of our growing realization that faculty need ongoing support with AI tools. Your co-authors work in the teaching & learning center at the University of Central Florida (http://fctl.ucf.edu), and we see firsthand that the faculty appetite to learn more about artificial intelligence is insatiable. It is not enough to provide merely an orientation and primary training. As faculty become familiar with one or more GenAI tools, their level of sophistication rises, and they are ready—and even hungry—for new challenges. Even more importantly, AI tools continue to proliferate, with new ones coming to market constantly, and even the familiar ones update over time, both by adding functionality and by changing how the tools might be used.

This work attempts to capture a snapshot in time (mid-2024) of the various ways GenAI could be used by educators in the course of doing their jobs. Many of the specifics discussed here may well become outdated very quickly, but the germ of the idea will hopefully ring true even with AI tools of the future: namely, that we educators, like all workers in the knowledge economy being turned upside down by the promise of AI, need to demonstrate our ability to USE artificial intelligence, and to add value to its output. As the now-common saying goes, "You will not be replaced by AI… you will be replaced by someone who knows HOW to use AI."

All of your authors come from a background in humanities and writing, and so it is not surprising that each of us experienced some version of the seven stages of grief when GenAI burst onto the scene. Do you recognize yourself, or any of your colleagues, in Kübler-Ross's framework from *On Death and Dying* (1969)? Many of us started at the beginning phases by being in shock and denial—and we experienced pain, anger, and depression—but after spending a few months bargaining, we're now reconstructing, working through the changes, and settling into acceptance... even hope! We're aware that some frontline faculty members are still in the denial phase, and it is our hope that this book will help convince them that AI is not only inevitable and already here, but that it can be quite useful to them as faculty members as well.

In the sections that follow, we will lay out applications for AI by educators, proceeding one at a time to lay emphasis on each basic idea, but then also allow space for some examples and a slightly deeper dive. We refer to these AI applications as "hacks," a term by now familiar in uses such as "life hacks" which has become synonymous with "tips and tricks."

GenAI Fundamentals: How Large Language Models Work

It's worthwhile to pause for a brief explanation of how ChatGPT and similar tools work. There are many different types of AI, and several of them have been part of our everyday lives for years. Smartphone apps that provide driving directions are powered by AI, as of course are home assistants (Alexa, etc.) and machine translation apps

that effortlessly convert English into another language, even signs and printed text as seen through the phone's camera, and vice versa. And there are many other such examples in modern life.

ChatGPT and several of its competitors (Copilot, Gemini, Claude, Perplexity, etc.) are part of a branch of AI called "generative" AI, which is a category of software that generates an output after having learned common patterns and structures. The category includes not only text but also images and even video. Those that focus on text are called Large Language Models (LLMs). LLMs can generate text because they have absorbed billions or even trillions of pages of text, often described as having been "trained on" the material. This could include parts of the internet, published books, academic articles, and almost any printed and digital material deemed relevant for a broad audience. Ultimately, exactly what an LLM has been trained on remains a black box mystery, as few of the companies have been forthcoming with details. ChatGPT is so named because it's optimized to provide a conversation ("chat") that optimizes its generative pre-trained transformer ("GPT") training.

LLMs are essentially word-predictors. Based on all those prior examples of recorded text, they have a good idea of the next logical word in any given sentence. Thus, these systems don't actually think. They don't even comprehend the meaning of their words, leading some scholars to compare LLMs to parrots—they can mimic speech, but don't understand what they are saying. Therefore,

everyone from educators to students needs to remember that these word predictors are not answer-generators.

Or to put it more accurately, LLMs CAN—and almost always will—generate answers, but they are not always accurate. In the rare cases one of the LLMs refuses to offer an answer, it will claim to not have access to the most recent events or what's current on the internet, or it will offer a rationale why it should not generate an answer for a particular query. But if it does provide an answer, it will deliver its response with verisimilitude and with absolute certainty.

It's understandable why users might accept LLMs' explanations and arguments since they are usually delivered without the slightest hedging or trace of hesitation. Yet its answers are not always trustworthy. Since they not accessing a database of information known to be true, but merely generating "plausible next words," LLMs sometimes invent (often called "hallucinate") facts and details wholesale, and baldly assert them as if they were true. Fans of the board game Balderdash will recognize a similarity—like players in Balderdash, LLMs try to convince their audiences that they have provided true definitions. At the same time, while LLMs should be potentially distrusted when it comes to factual information, academic citations, and specific quotes, they are actually quite good at brainstorming and ideation—in particular when creating lists of sub-topics or bullets that relate to a given prompt.

AI Fluency

Clearly, students will need new skill sets in the future to meet the challenges of future workplaces. Much has been accomplished toward career readiness through the efforts of the National Association of Colleges and Employers (NACE), particularly through the definition of eight core competencies: career and self-development, communication, critical thinking, equity and inclusion, leadership, professionalism, teamwork, and technology.

We first defined AI Fluency in our 2023 open-source book *ChatGPT Assignments to Use in Your Classroom Today* at http://bit.ly/chatgptassignments. Since then, we've updated this definition and now view AI Fluency as consisting of five components:

1. Understanding how AI works
2. Deciding when to use AI (and when not to)
3. Applying effective prompt engineering methods
4. Displaying digital adaptability
5. Adding human value

These components are, in our view, broad enough to capture AI Fluency for not only ChatGPT and all LLMs, but also extend beyond GenAI to other types of AI as well.

The first component, understanding AI, is important because there are different branches of AI—each with its own strengths and weaknesses—and one must understand the AI currently being employed to fully grasp its capabilities. LLMs like ChatGPT, for example, may be

prone to hallucinations, but this is not true of every type of AI. Artificial intelligence tools of the future may not construct output in the same fashion, so it's important to have a minimal understanding of how the AI tool at hand creates its output.

Deciding when to use AI and when not to is the second component. An experienced AI user must exercise sound judgment about the output of a particular AI. With LLMs, we know that it's neither safe nor ethical to copy its output wholesale and represent this text as something created by an individual. There are also ethical issues of ownership and copyright, including the works of deceased creators. On the other hand, some uses of AI may be warranted, or even desired. For example, instructors may assign students to use LLMs to brainstorm ideas or use it themselves to assist in creating an assignment.

Because AI doesn't have the lifetime of experiences a human does, it is extremely poor at reading between the lines, or knowing what an imprecisely worded question is actually asking. Therefore, our third component to AI Fluency is creating effective prompts that elicit useful or desirable output. As the common phrase goes, if you put garbage in, you'll get garbage out. We need to think about prompts (the question posed to the AI) in ways that are systematic, intentional, and deliberately plotted. While some disciplines already train students to think with these methods, especially about the architecture of programming or arguments, many do not. Prompt engineering is in many ways a discipline unto itself, and we all need to

become better at it. See the following section for more details about effective prompt engineering.

The fourth component is digital adaptability. We recognize that artificial intelligence will continue to evolve; in fact, many believe its evolution and advancement will accelerate over time. As a result, people will not stay fluent if they are habituated solely to the one AI system they know. There will assuredly be future AI products, and these need to be approached with an attitude of curiosity and optimism, or at least not with reluctance, irritation, or resignation that yet another new system needs to be learned. We will all need the kind of disposition that welcomes lifelong AI learning and the flexibility to keep our attitudes positive as we embrace ongoing AI change.

A truly critical skill, especially with ChatGPT and its hallucinations, is the ability to analyze and evaluate AI output, and in the process add human value, which is our fifth and final component of AI Fluency. We are increasingly seeing deepfakes in images and videos concerning public figures and celebrities, such that one truly should not trust one's eyes when viewing digital images. We know that LLMs invent facts, names, and publications, and it does so with such confidence as to border on chutzpah. Users need to remember to approach AI output of *all* types with appropriate skepticism, a skill we likely need to develop further. Because AI can already automate so many tasks—and because future artificial intelligences will continue removing human agency from additional processes—the only employees needed in the

workplace of the future are ones who can add additional value to what the AI creates. This might look like correcting the AI output or applying/integrating it into other systems and processes that the AI cannot perform. After all, if workers CAN be replaced by AI, arguably they deserve to be. Future workers need to be "better than AI" to compete in the marketplace, and it's our duty as educators to get them ready for that future.

A Deeper Dive into Prompt Engineering: CAPTURE

Because LLMs are still so new, there is not yet clear consensus on the best ways to prompt them. Some prominent advocates, including author and blogger Ethan Mollick, suggest that no rigid scheme or pattern to prompts is necessary at all, since LLMs are optimized to hold ongoing conversations, and users can simply adjust the ask with additional refinements, even ones written in half-sentences as one might say out loud to a human partner in conversation.

Others, however, have tried to put some order and science into the process of prompting. Author Dan Fitzpatrick was first out of the gate with **PREP**: Prompt with a concise command, Role for the AI to undertake, Explicit instructions on what to do and how to do it, and Parameters such as format, tone, and length. He later refined this to **PREPARE**, adding Ask (tell it to ask you questions for refinement), Rate (it should grade its own response), and Emotion (appealing to its emotional side).

Dave Birss's model is named **CREATE**: Character (giving the AI a role), Request (specific output you are looking for), Examples (give ideas to exemplify the desired tone), Adjustments (with refinements in follow-up prompts), Type (define the output's format), and Extras (such as encouraging the AI to ask you questions or explain its thought process).

With these models in mind, we set out to create our own framework that was both more specific AND able to be collapsed into a shorter format. Our framework is **CAPTURE**:

- **C**ontext – tell the LLM why we need this output
- **A**ttitude – specify desired sentiment or tone
- **P**ersona – tell the LLM to roleplay as someone (this often improves output)
- **T**ask – define what output the LLM should create; the core of the ask
- **U**niqueness – include details, adjectives, adverbs to strengthen output
- **R**equirements – ask for a specific length, format, level of sophistication, and the steps the LLM should take
- **E**xplain – how is this output derived? What steps did the LLM take to arrive at an answer?

At first glance, our framework is similar to those created by Fitzpatrick and Birss. However, we also recognize that actual prompts used "in the wild" usually unfold in a specific order, which does not follow **PREPARE**, **CREATE**, or even **CAPTURE**.

We think of the essence of a real prompt to be, in this order: **P**ersona, **C**ontext, and **T**ask (or PCT for short). The remaining elements of CAPTURE are really sub-bullets and refinements of the "task": Uniqueness, Attitude, Requirements, and Explain.

Here's an example of a prompt to put into an LLM:

You are a college student researching medieval life (Persona). You need to learn about daily medieval life in Europe for an upcoming essay you will have to write (Context). Write five examples that explain how medieval life was not that different from modern America (Task). Include both gritty and mundane details, as well tools used in everyday life (Uniqueness). The output should be slightly playful (Attitude). The output should be organized in bullet points, and should be no more than two pages long, written at a level a middle-schooler would understand (Requirements). Specify which research and sources were used to arrive at this output (Explain).

Finally, we encourage educators to become familiar with tools that can help you get even better with prompts. One such tool, Prompt Perfect asks you to write your prompt as best you can, then it will interview you for more information, and finally return a longer, more specific prompt that can be pasted into your LLM of choice. This type of inter-tool use of AI is likely the future of GenAI in higher education, at least in the short- to middle-term.

A Deeper Dive into Image Prompt Engineering: SCALE

Prompting a GenAI tool to create an image (also called text-to-image functionality) requires some different vocabulary. The CAPTURE method isn't a perfect match for what you need when detailing what an invented image should look like. Instead, we advocate the SCALE framework:

- **S**ubject
- **C**ontext
- **A**ctions
- **L**ayout
- **E**lements

The "elements" portion could fruitfully be expanded to include characteristics, details, adjectives, and style of the subject or overall image.

Here's an example prompt using SCALE:

Create an image of a cartoon eagle (Subject). The eagle should look friendly, as if from a child's picture book (Context). Depict the eagle flying a kite in a thunderstorm and speaking with a cartoon turkey (Actions). In the background, show a few trees and, off to the side, a red barn (Layout). Despite the setting in a thunderstorm, the image should be bright and cheerful, showing vivid colors such as the green grass underfoot and the rainbow-colored kite (Elements).

Scope, Reach, and Organization of This Book

The tips and tricks provided in this volume were predominantly created without one particular GenAI tool in mind, partly in recognition that today's leaders in LLMs technology may not be the leaders of tomorrow, or that LLMs might not even be the AI that matters mere years from now. However, this approach was not universally adopted. Some of the hacks discussed here are in fact specific to one tool. We are aware these examples will not age well. Other GenAI tools might add similar (or better) functionality, for instance. It's also possible the tools displayed here might remove the discussed functionality in the future. Even the business models may change for specific tools, making the provided explanations outdated. Nevertheless, we felt it important to capture some up-to-the-minute (for 2024) best practices, which, in today's fragmented world of AI tools, meant including some specific tools and their capabilities.

All of the sample prompts provided in this book were vetted with ChatGPT 3.5 (the public and free version) in mid-2024 to verify that they would provide interesting and relevant output that might be profitably utilized across disciplines. Future searches of ChatGPT, or of other LLMs, might not yield productive results. That said, it is our hope and strong suspicion that many, if not all, of the sample prompts provided here could apply to other LLMs beyond ChatGPT as well. We expect that most of these strategies, in other words, could be used by almost any related AI.

As for AI-generated text within this volume: there isn't much. We wrote this book in mid-2024 without using AI, except in limited ways to test sample AI prompts for each of the assignments, and to aid with first drafts of the chapters about research. While we recognize that future book-length works may opt to follow our advice about using AI to help outline and chart writing projects, our own process only did so mostly as verification and after-the-fact analyses instead of as first steps. We find it to be natural that current pedagogy experts and holders of terminal degrees may continue with their established composition practices that do not use AI in the initial stages, while the opposite may become more common for undergraduates in the next few years. Eventually, of course, these undergraduates will become our institutional colleagues, and yet another shift in mindset and practices may become advisable and necessary.

While the book is organized by a contiguous set of numbers, it is also divided into sections: making your teaching life easier, making your faculty life easier, making your research easier, and additional specific AI tools you might want to consider. We conclude with some ruminations on how AI tools might continue to evolve, as well as our ways of using them to improve our lives and work outputs. We hope this book will provide you with support during these exciting—and daunting—times and inspire you to explore the possibilities of engaging LLMs and other AI tools into your curriculum.

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UCF Faculty Center for Teaching and Learning

Section I: Make Teaching Easier

1

Craft an Enticing Welcome Statement for Your Syllabus

We often think of syllabi as legal documents that help adjudicate process and grade disagreements with students, or at a minimum that help set and calibrate student expectations when it comes to the number of major assignments, the anticipated weekly workload, and unique classroom policies. While these are all important and necessary functions of syllabi, a syllabus that only includes such core elements can very easily drift into an off-putting legalistic tone, creating the risk of alienating students in their first introduction to the course, when in fact we could (and should) be using the syllabus document to set a positive tone. After all, the syllabus frequently serves as students' first introduction to you and to the course. If they encounter only no-nonsense expectations, it's only natural that they may take the tone of the syllabus as an indication of what your personal interactions could be like.

Given that LLMs are trained by ingesting countless pages of text, it is not surprising that they are expert at crafting texts themselves, especially ones shorter than a few pages. In this case, since we are only seeking one or two paragraphs, any LLM should be capable of creating the

desired output and tone. We just need to ensure, via careful prompt engineering, that we provide enough details about the desired output that it strikes the right tone.

Sample LLM prompt:

Roleplay as a college instructor assembling a syllabus for a course you'll be teaching for the first time. You've already set the schedule of readings and assignments, and you know how the assessments will be weighted for the final grade. But you're worried the tone of the syllabus might feel too legalistic for students and may make them unconsciously dislike the subject. Create a two-paragraph welcome statement for the start of the syllabus that will instead have the effect of making students excited for the subject and this class. The class is first semester organic chemistry, a class many students dread for its math content. Many of the enrolled students are historically pre-med majors who dislike organic chemistry as a tiresome requirement for the major. Stress the positive elements of the course for a pre-med student, as well as how its topics will be useful for many STEM-related disciplines. The tone should be optimistic, encouraging, inspiring, and persuasive for a traditional-aged college student.

2

Summarize Your Biography for the Syllabus

Because students so frequently encounter depersonalized syllabus documents, meaning there is little information about the instructor as a person, many students never become curious in the first place about the human being behind the class. This is a missed opportunity, however, since there are proven benefits when instructors humanize themselves to students, including students trying harder and studying more due to the social and interpersonal dynamics, ultimately leading to greater student success. Thus, it's a recommended best practice to introduce not only the course in the context of skills to be prioritized, but also by introducing the instructor, ideally in a way that demonstrates your experience and readiness to teach this topic, but also injecting your own personality and humanity into the introduction. Creating such a summary on one's own is possible, but it requires considerable time and thought, particularly when customizing a biography for a specific course.

While it can be a drawn-out process to manually provide direct and succinct connections between one's diverse CV and the course in question, such a task is simple indeed for

an LLM. While some LLMs crawl the current internet where your CV may be available online, it's safer to direct the LLM to look at your CV only. This can be done by uploading the CV to the LLM (if you've chosen an LLM that allows uploads), or by pasting relevant parts of your CV along with the prompt.

Sample LLM prompt:

You are a sociology instructor. Next semester you will teach a class on environmental sociology, which you have not taught in more than seven years. Summarize the attached curriculum vita into an "About the Instructor" statement for the environmental sociology syllabus, making sure to point out the instructor's past publications and preparation to teach this subject. The tone should be inviting, warm, and relatable for the average college student. The statement should only be one paragraph long so that students actually read it.

3

Draft a Syllabus Statement to Map Course Outcomes to NACE Competencies

It is an unfortunate truth that many students view college solely as a means to an end, as if its only value is the diploma that is needed to land the job. The underlying assumption tends to be that what they *actually* need to know to perform the job will be taught to them while working in the job. We know this to be fallacious thinking, and so do employers, but it has proven difficult to disabuse students of this kind of mental shortcut.

One strategy that can help is to remind students—in every semester and in every class—how a particular course will impart skills and knowledge that will be useful for their future careers. Fortunately, we don't need to reinvent the wheel of career readiness. The National Association of Colleges and Employers (NACE) has long advocated for a useful framework of competencies that evaluate career readiness across multiple domains: Career and Self-Development, Oral/Written Communication, Critical Thinking/Problem Solving, Teamwork/Collaboration,

Technology, Leadership, Professionalism/Work Ethic, and Equity and Inclusion.

Because the NACE competencies are not new, every LLM should know what they are in detail, and it would not be difficult to upload/paste the course's Student Learning Outcomes (SLOs) into the LLM and ask for a syllabus statement that maps the SLOs to the skills employers want.

Sample LLM prompt:

Pretend you are an experienced humanities instructor, about to teach an Intro to Humanities course. You are aware that a majority of students in this class are taking it to meet General Education requirements for graduation. As a result, historically many students have struggled to see the relevance of the course to their future careers, especially if they are studying a STEM-related discipline. Write a one-to-two paragraph statement for the course syllabus that highlights for students the ways in which this course will advance their career readiness, as seen through the categories of the NACE competencies. Do this by examining the student learning outcomes and major assignments in the uploaded document. The statement should have a conversational tone, making the instructor appear approachable yet persuasive. You should also clearly indicate which assignments/outcomes map onto which NACE competencies. There is no need to find a match for every NACE competency.

4

Write a Syllabus Statement for How to Succeed in this Course

Although we might normally assume students who were accepted to college are truly "college-ready" in terms of fundamental math and writing skills, many are not… and most have not yet fully developed their critical thinking and problem-solving abilities. Surprisingly, this is sometimes true even at some of the most prestigious universities with strict admissions standards. Some students simply had an easier time in high school. Because the assignments and pace of learning in high school are slower than in college, many students were able to earn good grades in high school without needing to employ study skills or habits that help achieve long-term memory storage and deep learning. As a result, even "straight A" students sometimes don't know the most fundamental study strategies like spaced retrieval practice and self-quizzing. We as faculty should all feel a sense of ownership that it is our job, in every class we teach, to ensure students are exposed to techniques to help them become better students.

Effective study skill strategies are well understood by learning scientists, in particular cognitive psychologists.

Although people may have differing learning preferences (such as group vs. solo study, silent study vs. listening to light music, etc.), it turns out that by and large humans learn in the same ways. Because this has become an agreed-upon science, much literature exists that lists the basics, and therefore LLMs are easily able to summarize these study skill techniques into a syllabus statement.

Sample LLM prompt:

Assume the character of a full-time lecturer working for the Interdisciplinary Studies program. Next semester you'll be teaching a First Year Seminar course, which is often taken by First Time in College (FTIC) students as an onboarding course to the institution. Draft a syllabus statement entitled "how to succeed in this course" that explains effective study skills and strategies. Make use of wisdom gleaned from cognitive psychology but do not specifically refer to any particular studies. You should list at least six strategies, with 1-2 sentences of description and elaboration each, that will aid students in truly memorizing the information contained in your course. Keep the tone practical and attuned to the level of a high school senior. Make explicit to readers exactly why each strategy works for long-term memory formation.

5

Compose Syllabus Policy Statements

Syllabi are pretty self-explanatory when students are seeking to understand the workload of the course or how many tests and essays there are. But college classes differ from each other in significant ways, often having to do with the instructor's expectations. One instructor might expect students to rewrite essays significantly between drafts, while another might never bother to check. One instructor might expect every citation listed in APA 7e format, while another might assume that no one needs to use citations at all. If these expectations are not clearly communicated, at a minimum students could become confused. But worse outcomes are also possible, such as students making their own assumptions and losing points if they didn't match the instructor's assumptions. Syllabus policy statements provide clarity for both parties.

Experienced teachers know how to craft syllabi statements, but might still benefit from the brainstorming prowess of LLMs to dream up other possible, even advisable, policy statements. Newer instructors, meanwhile, might depend heavily on an LLM-generated list of policy statements so that they can leave as little to

chance as possible. Both populations of teachers will also benefit from how quickly LLMs can generate text. In no time at all, LLMs can generate lists of policies to include, as well as draft versions of the policies themselves, saving faculty hours of work.

Sample LLM prompt:

You're an instructor with a new colleague in your department who wants advice on creating syllabus policies for an introductory course on Finance in the College of Business. This new colleague has never taught before and has nothing to base their syllabus on. Suggest a list of 5-8 policies for grading that are common on syllabi in similar courses, another 5-8 policies about technologies (both instructor and student), another 3-5 about academic integrity and the technologies related to monitoring, and finally another 3-8 policies about the course not in those categories. Make each policy only 2-3 sentences long. Ensure that the tone is neutral rather than condescending, rude, or assuming the worst in students, but also not so welcoming that students are tempted to seek exceptions.

If the LLM provides definitions but not examples, follow up with a request for sample language for all the policies.

6

Prepare a Course Proposal Submission

In many institutions, faculty require permission from their institutional peers before they can teach a completely new course for the campus. This may take the form of departmental approval, as well as permission from a curriculum committee, and sometimes even an interdisciplinary committee such as one for General Education or Undergraduate Studies. In some states, faculty even need to gain approval from a state governing body or board. Such course approvals are often thorough, requiring the submission of not only the course description and the whole syllabus, but often the complete list of student learning outcomes, deliverables and main assignments, and a schedule of weekly topics. It requires significant time and effort to put together all those documents—without a guarantee that the course will ever come to fruition—which can act as a disincentive to attempt submission in the first place.

Large Language Models can create first drafts or polished revisions of all the required documents mentioned above, thereby saving instructors a lot of time, or at minimum

providing them with a starting point and lots of ideas for inspiration.

If you have access to an LLM that allows you to upload documents, such as GPT-4o, Claude, or Perplexity, you can get even more enhanced results. Begin by uploading similar documents from other courses, then ask for a custom output that mimics those uploaded samples but for your new topic. Note that the LLM may have a limit on how many files per message are allowed.

Sample LLM prompt:

Let's start a role play. You will be a relatively new instructor in the anthropology department looking to get a brand-new course approved through various institutional committees. The course will be a 3000-level class entitled "Denisovans and Hobbits: Separating Facts From Fantasy." Create first drafts of all documents required to submit a proposal, including a paragraph-length course description, a syllabus, 8-10 student learning outcomes written with Bloom's action verbs describing what students will be able to do by the end of the course, a list of larger assignments, and a weekly schedule of topics.

7

Revise Existing Assignment Prompts to Nudge Student Success

While stronger students know how to interpret the nuances of an assignment prompt to ensure they are maximizing their responses and they aren't forgetting any angles, many students have not yet learned how to answer with sophistication and complexity. Certainly, additional student preparation and practice would help, but so too could a longer, more detailed prompt that clarifies directions for students to follow when crafting a response. This is not to say that our "normal" assignments are inadequate, but it is true that we sometimes forget to explain HOW an assignment will be graded (or how students should best go about completing the assignment). Even more common is that we often forget to explain WHY an assignment is assigned in the first place. If students don't fully grasp the purpose behind an assignment, they might struggle with adequately meeting that need—and the reverse is true as well. Knowing the purpose will help them rise to that specific occasion in their answer.

To improve your assignments, paste them one at a time into the LLM along with a prompt to add transparency (the "why", the "how graded", and the "how to complete" details). You may also want to ask the LLM to explain the features of a high-scoring example.

Sample LLM prompt:

Let's start a role play. You will portray an instructor in Interdisciplinary Studies about to begin a course teaching students to use ARC GIS software. You're aware that some students in the past have struggled with the major assignments. Adjust and lengthen the assignment prompt that is pasted below in such a way that students will have a clearer understanding of how to proceed. Begin by explaining the rationale for giving the assignment (what skills does this reinforce?), and make sure you explain both how it will be graded in terms of specific rubric elements, and what steps students should take to complete the assignment successfully. Include details about what a high-scoring paper would look like.

8

Create Assignment Prompts

While faculty members are experts in their field, that knowledge doesn't always translate easily to course design or effective prompts for large assignments. It takes creativity to write good prompts, which can therefore require large investments of time. In today's digital era, when electronic tools make it easy for students to share material from previous semesters to future semesters, there is a need to constantly refresh our assignments, increasing our workload.

Apart from the time-saving element, LLMs can improve the process because they have access to many hundreds of examples, having ingested billions of pages of text in their training. This extensive training makes it possible, likely even, that an LLM-generated series of suggestions for assignments could yield unexpected discoveries. It is recommended that the LLMs be asked for multiple top-level ideas for prompts at first, since faculty will want to judge the idea itself without the details needing to be in place. Once a winning idea is selected, it's easy to create follow-up prompts to generate the final full prompt, including a longer description, a list of student learning outcomes, and a list of requirements for the product.

As a side note, consider that many students appreciate a choice in projects, so it may be best to narrow the list down to 2-3 choices rather than just one project everyone in the class must work on.

Sample LLM prompt:

In this scenario, you will inhabit the persona of a mechanical engineering instructor. Knowing that students share assignments and submissions with each other from prior semesters, you are motivated to create new assignments each year for your capstone class. Create a list of 10 possible capstone projects for your Senior Design class in mechanical engineering. For each list item, provide a 1-2 sentence overview (we will later choose a winner and seek a longer description, SLOs, and product requirements).

9

Invent Course Readings for Writing Courses

Courses that primarily teach writing or languages (including both English such as ESOL courses and foreign languages) face unique difficulties in the era of GenAI. Almost any assignment one might dream up is something an LLM would be able to write for a student. In these courses, the language itself is the content, and LLMs by definition deliver flawless language. Any culturally-related content (such as famous literature written in the target language) we might think to include in the assignment so that there is content beyond language is likely known to the LLM as well. What we need is a piece of content NOT known to the LLMs, yet not tremendously difficult for students to grasp.

Oddly enough, even though the existence LLMs create the problem here, they can also create the solution! If we need content that isn't part of the ingested training of any LLM, we just need to ask this same LLM (or a different one) to invent something, such as a story or a case study. With everything entirely fictional, the details won't exist in the training of any LLM, and an assignment based off that reading would be safe to give students in an LLM-infused

world. One caveat: some LLMs use input prompts, as well as their generated outputs, to continue to train the model. In that event, a fabricated product or story might become part of the knowledge base of this particular LLM. If you have access to it, a "walled garden" LLM is the optimal place to generate the invented product or story, since this type of LLM does not "phone home" and train the model. You are most likely to have access to such a walled garden LLM if your university has arranged for this type of LLM at an institutional level.

After the fictional text is created, it can become a reading assignment. Then, a writing assignment based on that reading can be created. (In the example below, writing a marketing strategy could be one such assignment.)

Sample LLM prompt:

Working as a graduate teaching assistant in charge of your own Composition class, create a detailed case study about "divisional zyblocks," a physical product used between fingers to alleviate arthritis. Although this is a fictional product, you will write a case study about it as if it were real. Invent the history of its development, including details about key players and conflicts (financial, political, or medical) that occurred along the way to FDA approval. Make sure the case study is at least five pages long, adding enough embellishments and details that it reads as realistically as any published case study. End the case with the next pending step being marketing to the public.

10

Generate Test Questions

Faculty can be forgiven for re-using tests semester after semester. After all, who has time to write all new questions each term? The problem is, eventually these test questions make it out into the student community, whether through third-party clearinghouses (CourseHero, Chegg, etc.), on-campus Greek organizations, messaging apps (WhatsApp, GroupMe), or even loose friendship networks. Once the actual test questions are out there, student cheating is likely to increase.

LLMs, fortunately, are quite adept at creating test questions, including multiple-choice questions, arguably the most desirable kind for instructors, because they are self-grading. Of course, LLMs are equally good at inventing open test questions as well, in case you have adequate grading resources at your disposal to use this more accurate gauge of student understanding.

The prompt for the LLM could be as simple as asking for ten multiple-choice questions about a single sub-topic from the current chapter. However, if a level is not specified, you might find the output heavy on definitions

and identification, which are low-level tasks that might not be a match for what you're trying to test. Instead, it's useful to specify one or more levels of Bloom's Taxonomy for the questions to be generated. It can be an especially effective strategy to generate a miniature quiz bank of each sub-topic. Most LMSs (Canvas, D2L, Blackboard) allow for test question groups, such that every student gets a different test, but each test has one question on each sub-topic from the chapter.

Note: it's important to reset the LLM by clicking the "new topic" (or "new conversation") button after each generation of questions. Otherwise, what's being asked will begin to blur, as the LLM believes you are continuing a conversation rather than starting a new one.

Sample LLM prompt:

You are a physics instructor teaching first-year college Physics. You've had evidence before that tests from previous years are in the student population, so you want all-new tests. Create ten multiple-choice questions on the subject of Vectors, Scalars, and Coordinate Systems. The first five should be gauging Knowledge or Comprehension on Bloom's Taxonomy, while the last five should test Application. Each question should have a relatively short stem, and four possible answers. The three distractors should be realistic options that an uninformed student might select.

11

Generate GRE-Style Test Questions

In the era of GenAI, the take-home essay may be dead. In a majority of cases, students can meet the assignment by having an LLM generate an output. Some students know to doctor the output to decrease the chances they will get caught, but by and large this type of assignment is on the wane, particularly as automated writing tools continue to increase in complexity. Eventually we won't be able to confidently distinguish student writing from AI writing no matter what we do.

As a result, we need new ways to think about measuring critical thinking, especially in online classes, where we don't have the option to perform in-class writing. The most viable solution, at scale, is to switch to multiple-choice testing that measures higher-order thinking. Such questions are difficult to write, but we've seen them work in tests such as the GRE (and to a lesser extent, the SAT). The examples usually boil down to a dense text to read, followed by several questions about the text that call for judgment and evaluation.

We can generate such questions with an LLM, saving vast quantities of time, so long as we prompt carefully. We can also ask some LLMs—like GPT-4o and Gemini Advanced—to create images, tables, charts, and other illustrations to accompany these questions.

In the example below, a few alterations from the previous example yield totally different results.

Sample LLM prompt:

You are a physics instructor teaching first-year college Physics. You've had evidence before that tests from previous years are in the student population, so you want all-new tests. Create five multiple-choice questions on the subject of Vectors, Scalars, and Coordinate Systems. All five of these questions should test Analysis or Evaluation on Bloom's Taxonomy. The questions should be preceded by a text and/or graphic to read and interpret, and all five questions will depend on understanding the reading and graphic. The three distractors should be realistic options that an uninformed student might select.

12

Develop Rubrics

Many faculty members rely on rubrics to grade student work because they often streamline the process by allowing us to easily pinpoint relevant categories that impact grades. Students appreciate rubrics as well since they provide more details about our expectations for the assignment. However, while rubrics save time during the grading process, they can be time-consuming to create and calibrate.

LLMs can help. Because they generate text so well, it's easy for them to create the various levels of each rubric category (top scoring, middle levels, and low scoring). Faculty members only need to specify what the categories are, each one functioning like a sub-grade of the overall score. Such an output alone would be a time saver for faculty, even if delivered one paragraph at a time. However, many LLMs—including Copilot, ChatGPT, and Gemini Advanced—can deliver an entire rubric in a table format, which can then be copy-pasted directly into a document file. While the documents cannot yet be imported directly into an LMS for the kind of grading that involves clicking the rubric on-screen, the table format makes it easy to see what to duplicate within the LMS interface.

Note: the LLM's first attempt may lack enough specifics to be immediately usable. You may have to refine the prompt and try again, add details regarding your assignment, provide a strong student example, and/or engage the LLM in an ongoing conversation to add the missing parameters.

Sample LLM prompt:

Roleplay as an instructor who is teaching future K-12 educators. You need to create a rubric for a new assignment you are trying out, in which preservice teachers will give a mock math lesson about multiplying fractions to fellow undergrads portraying middle schoolers. Write a rubric in table format that gives up to ten points each in these categories: completeness, accuracy, interactivity, and classroom management. Provide detailed descriptions of how each level of accomplishment looks for each category, with the levels including advanced (9-10 points), medium (7-8 points), and developing (0-6 points).

13

Flag Surface Errors in Writing

Not every college student enjoyed rigorous writing instruction in high school or middle school. A number of college students, in fact, simply accept the score assigned to writing assignments without questioning what could have been improved. As a result, some students lack the kind of fundamental curiosity that would to prevent future recurrence of structural problems that might be endemic to their particular style of writing. A student prone to dangling modifiers, for instance, might never know why they keep earning scores in the 80s, yet also never inquire.

Large language models that allow uploads (Claude, Perplexity, and premium options) are ideally suited to the task of creating a custom summary of an individual student's pattern of grammatical and syntactical mistakes. In fact, the LLM can not only generate a summary of the patterns, but it will also excel at generating tutorials tailored to each pattern of mistakes. In this fashion, faculty can free themselves from needing to personally educate students on writing conventions, and yet continue to hold them accountable for effective communication and provide guidance for them to improve for the next assignment. Of course, it may be most effective to provide students with an opportunity to earn additional points if

they use the feedback provided by the LLM to improve the problematic sentences. Over time, this kind of correction will help students to improve their writing mechanics.

Sample LLM prompt:

Please take on the persona of a graduate student grader. Students have submitted five-page essays to the LMS for electronic grading. Since this is a history class, the instructor does want the grading to reflect students' writing abilities, and you have been asked to put a priority on identifying patterns in students' grammar and syntax mistakes, and to help them identify how to avoid future problems of a similar nature. Scan the uploaded essay for common mistakes in sentence structure, such as comma splices or dangling modifiers, as well as others. Identify the patterns of mistakes this essay makes, then provide a label to the problems and short definitions. Finally, include tutorials on how to structure sentences differently to avoid these problems in the future.

14

Derive Custom Comments for Essay Grading

Veteran educators know the pain of working through a collection of essays and realizing that many students are committing similar errors, whether they be aligned with interpretive/analytical misjudgments or more technical errors of grammar or syntax. One common grading technique in response is to craft "common comments" that apply to most of the submitted essays. While this shortcut is a valid technique to save the instructor time during grading, it comes at the expense of extensive comments customized for each student. As a result, a student receiving only standardized comments receives little personalized feedback about their writing.

Using Claude, Perplexity, or similar LLMs that allow for file uploads, import student essays one at a time along with a prompt to look for certain patterns. If nothing else, LLMs excel at standard written English and would be able to evaluate writing at a technical level. It is also worth asking the LLM to evaluate the essayistic elements of the submission, such as the strength of a thesis, use of transitions, identified topic sentences, connecting claims to evidence, linking (rather than stacking) of ideas, and an

effective conclusion. In this fashion, the student receives two types of feedback: one on sentence-level mechanics, and one on the macro elements of the essay. This frees the instructor to focus their comments on conceptual and theoretical concerns, or other elements of higher-order thinking being measured by the instrument.

If you have access to Claude Pro, GPT-4o, Gemini Advanced, Perplexity Pro, or another LLM that allows you to attach multiple files, you can upload a series of students' essays and ask the LLM to generate a list of common errors and subsequent suggestions and share it with the class.

Sample LLM prompt:

Roleplay as a lecturer in criminology teaching a course on serial crime. You've assigned a five-page essay, and all student submissions have been downloaded from the LMS to your local computer. Looking at the attachment, offer one set of suggestions to fix surface errors in the writing, and a second set of suggestions to improve the essay's mechanics, such as the strength and originality of the thesis, use of transitions, identified topic sentences, connecting claims to evidence, linking (rather than stacking) of ideas, and an effective conclusion. Both sets of suggestions can be numbered list, up to ten each. Finally, suggest an overall grade (out of ten) for each set of criteria.

15

Create Activity-Rich Lesson Plans

In classes where PowerPoint presentations are the main focus, instructors often prioritize delivering content through slides. However, they may give less consideration, if any, to incorporating interactive activities and promoting active learning among students. A lesson plan, traditionally present in the form of a printed sheet of paper kept hidden from students, often steers faculty more successfully toward thinking about a mixture of lecture and interactions. Yet it can be daunting as a new instructor to dream up enough varied activities to build engagement and promote learning, and even an experienced veteran can use help brainstorming.

LLMs are surprisingly good at crafting lesson plans that mix chunked lectures of 5-15 minutes and activities for active learning. The suggested time allotments for mini-lectures and activities are particularly useful for new instructors to gauge how quickly (or slowly) to go when introducing and reinforcing content.

Instead of simply asking for activities in a vacuum, one option is to guide the LLM by mentioning specific

possibilities, such as icebreakers, games, escape room challenges, debates, civil discourse activities, moral/ethical dilemmas, or mock trials.

Even without additional resources, LLMs will return a good variety of activities that are usually realistic enough to use out of the box. If you use an LLM that can scan a live website (such as Gemini, Perplexity, Copilot, or GPT-4o), you can optionally ask the LLM to suggest activities that fit the content from an online repository of interactions, such as our list at http://bit.ly/FCTL-CATS.

Sample LLM prompt:

You're a new instructor of anthropology. Since you are new to teaching, you need help writing lesson plans that ensure you include activities every 10-15 minutes, instead of just lecturing for the entire class period. Create a lesson plan for a 75-minute Introduction to Anthropology class. Today's class will introduce the chapter on apes and primates. The students have not yet read this chapter in the textbook; that will be assigned reading after today's class. Include at least three activities from the list found at http://bit.ly/FCTL-CATS.

16

Create Personas for Students to Use as Role-Play Partners

There is a longstanding history of students interacting with their peers during class hours as a way of deepening comprehension and application, as well as breaking up the class time into different activities for the sake of variety and mental interest. The most common modes of interactions here involve quizzing each other, group brainstorming, or joint problem solving. Another valuable method is to ask students to engage in a role-play, to inhabit the persona of someone related to the content being discussed. The benefits of role-plays are numerous, and include enhanced attention and concentration, seeing the content from a novel perspective, and increased retention of the material since it was experienced so personally and possibly with sharpened emotions. However, role-plays can be difficult to craft, and some students find it awkward or unfulfilling to embrace the "acting" side of a role-play. Also, any unprepared students might negate the effects of the activity.

Using an LLM as a role-play partner neatly solves the problems above. Since the "acting" now takes place via typing, fewer students will feel self-conscious. And,

barring increasingly rare hallucinations, LLMs will perform a stellar job at role-playing famous characters, or even invented ones if given enough details, background, and parameters.

If you plan to use role-playing frequently in your course, you may find it helpful to subscribe to a role-playing app. (We like Humy.ai which has trained its LLM on historical figures and allows you to create your own, and RolePlai which allows you to create a group chat.) Some LLMs also allow you to "talk" with the character you've created, such as GPT-4o. Pi.ai, another LLM, has a voice feature which can boost engagement during role-playing activities and does not require a paid subscription.

Sample LLM prompt:

You're an instructor in the College of Medicine teaching a class to first-year Med students, and the current module concerns patient interactions, ethics, and empathy. You need a way for students to roleplay scenarios that involve difficult conversations, yet feel like a safe space to make mistakes and try again. Create a prompt for another LLM that students can use to paste into the LLM and interact with an AI roleplaying as a patient, while the student, here playing the attending physician, informs the patient that the condition they have is actually a terminal illness. Make it clear that the student-LLM interaction is meant to be an ongoing conversation. The LLM should react in a realistic fashion to this news, and should challenge the "doctor" to find words of comfort or hope.

17

Generate Case Studies and Micro-Scenarios

Case studies are extremely useful for students, as they are often effective at piquing students' curiosity while also forcing them to apply concepts from the course. Students need to apply course concepts in order to solve these ill-defined problems, the very type of problems they are likely to face once in the working world. All of these factors contribute to making case studies highly engaging for students, particularly when approached in pairs or in groups, which adds social learning to the mix of benefits. Cases don't always need to be long and complex to be interesting and useful pedagogically. Even short two-sentence micro-scenarios could pose problems that require students to apply course concepts to find a solution.

However, it can be time-consuming for instructors to locate case studies or micro-scenarios for use in class, and it's even more time-consuming to create them ourselves. Fortunately, both types of problems are easily created by LLMs, which are surprisingly good at creating realistic examples. Faculty simply need to prompt the LLM to generate the requested number of scenarios/cases, and

then paste the output into a handout for class (or put on screen one at a time for small, simultaneous discussions).

Sample LLM prompt:

As a lecturer in Psychology, you have taught Abnormal Psych many times in your career. However, you've heard from a colleague that they had great success in doing reviews before each chapter test using case studies analyzed in groups, and you'd like to try it yourself. Create 10 case studies that call for students to decide which personality disorder is being described. Each case study should be 4-8 sentences long and should be written in a way that makes it difficult to decide between possible diagnoses. Include some cases with more than one personality disorder.

18

Generate Handouts to Evaluate LLM Output

One of the most tried-and-true methods of using GenAI since it was first launched in late 2022 has been to ask the LLM to generate an output of some sort, and then ask students to analyze and evaluate its response. Is it biased? Factually correct? What's its tone? Does it have blind spots, or areas of explanation that are too shallow? When generating code, what errors did it commit, and how could they be fixed? Can its translation of a foreign language be improved? The general idea is to habituate students to both generating AI output and improving on it. In the workplaces of the future, they will struggle to keep a job if they are only as good as the AI output. But to evaluate AI output—and especially to improve it—is an in-demand need for sure, at least in the short- to middle-term.

It's possible to place the entire duty on students' shoulders by asking them to also generate the LLM output, perhaps even creating their own custom prompt so that they can practice that skill as well. However, such an assignment combines skills in a way that might not be advantageous for novice AI users. For those truly new to AI fluency, it's enough to provide the outputs for them directly as a

handout, without needing them to also be expert at prompt engineering. Complex and multi-step tasks are best tackled one at a time until students are experienced at both, and then have the available cognitive load to attempt the integrative exercise.

Sample LLM prompt:

Take on the persona of a college instructor in computer science. You are aware that students have long had access to pre-made code from places like GitHub or GitLab, but LLMs have upped the ante by both making it seem easy to obtain custom code, tempting the student to trust more readily than they should since the code was created on demand and seemingly already aligned to the task perfectly. Yet the actual skill students need is to parse pre-existing code and adjust it to fit the requirements in the best possible manner. Create two examples of code that can be made into a handout for students to evaluate, in groups, what could be improved. The first example should use C++ to create a command-line task manager that would allow users to add, delete, and view tasks. The second example should use Python to create a desktop application that allows user to track expenses, categorize spending, set budgets, and generate reports.

19

Create Practice Quizzes, Worksheets, and Problem Sets

It's not entirely true that "practice makes perfect." Without adequate feedback, students might believe they have a correct answer when they don't, perhaps even leading to error fossilization. But the greater challenge most students face is a more fundamental lack of practice in the first place. Problem sets are usually limited in textbooks, and often look so similar to the examples provided in the explanations that a true application of the underlying concepts is avoided by using mimicry instead of critical thinking. What students need is a longer, more varied regiment of practice questions that will render them stronger overall in the application of core concepts.

With most disciplines that have an established base of knowledge, LLMs are quite capable of providing practice questions that help students prepare for a test. This is especially true in lower-level courses in the major, where the epistemologies are well-known and there are fewer fundamental discoveries in recent years.

The format of the output can take several forms. One simple idea is to generate questions and place them onto

the same handout, perhaps to use as groupwork during face-to-face class time. However, keep in mind that students need access to the correct answers as well. Those should ideally come on a second sheet, handed out later so that students aren't tempted to take a shortcut to the answers. The solution that best helps students avoid the temptation of shortcuts is to place the AI output into quizzes inside the LMS. This can automate the feedback without offering students a shortcut in lieu of thinking.

Sample LLM prompt:

You are an experienced instructor in civil engineering, looking for ways to put additional word problems in front of students, since you know from experience how valuable that extra practice can be. Your years of teaching have convinced you that few students will do optional problems, so you will configure these problems as required daily quizzes. Create 20 word problems to prepare students for a chapter test on hydraulics and hydrology. Half of the problems should be multiple-choice, while the other half should be open-ended. In all cases, provide a mix of knowledge, comprehension, and application questions. Provide the correct answer for each in parentheses after each question.

20

Quickly Create Presentations

One of the primary strengths of an LLM is its ability to summarize, extract, and synthesize information. By inputting your content into an LLM—or attaching a new chapter from an OER (open education resource) or other common resource—you can quickly prompt the LLM to create an outline of a presentation with slides that include a title, bullet points, notes for the speaker, and suggestions for images. Currently, Claude and Perplexity are the only two of the larger, free LLMs that allow you to upload a PDF or other form of text file, eliminating the need to cut and paste the information into the chat interface while adhering to its word count restrictions. You can, of course, input sections of your content into a chat interface and ask the LLM to generate slides based on that material and keep feeding the model until it has all the information, but that process is time consuming and many LLMs have chat interface limitations that may force you to begin new "conversations" before you've completed the task.

If you have a great deal of content, premium accounts—like GPT-4o, Claude Pro, Perplexity Pro, and Gemini Advanced—allow you to input multiple documents and prompt the LLM to synthesize the key points from all of the materials. This can be especially helpful for

when you're creating materials related to specific themes or concepts.

When prompting the LLM to generate content for presentations, it's important to ask the LLM to only use the content you'll be providing and to avoid adding any of its own knowledge… and it's important to make sure that those directions were followed. If not, LLMs have a tendency to pull from many sources which might differ from your inputted content. After approving the content, you can ask it to generate images (or image ideas) for each slide. Many LLMs can generate images, even in free versions. GPT-4o can generate content and images for each slide, and even deliver it all together in a PowerPoint file that you can download and tweak.

Sample LLM prompt:

You are an interdisciplinary college instructor who strives to make learning fun for the undergraduates you teach. You're creating content for a PowerPoint presentation to be used for class discussion on types of nanomaterials. Ignore any knowledge you have of the topic and only use the text that is at the end of this prompt [or attached]. The purpose of this presentation is to cover the unique properties at the nanoscale (e.g., quantum effects, surface area) and educate students on how these theories impact their daily lives in interesting ways. Generate the content by using the Title, Content, Image format and include notes for me while I'm presenting. Also, suggest images for each slide and, after I approve, generate those images.

21

Add ALT Text and Captions

As educators, we recognize the importance of ensuring every student has access to the materials they need to learn. But writing explanations for complex images can be challenging. Writing Alternative (Alt) Text is an art and a science which forces us to consider meaning, context, conciseness, and language. When looking at graphs, tables, or other diagrams that illustrate complex concepts, it's often difficult to know where to begin.

LLMs are an effective tool for beginning the process of writing Alt Text and tweaking its output is often a much more appealing option than the blank screen. Many LLMs (including Claude and Copilot, and allow you to upload an image and, after doing so, you can then provide the LLM with the context of how the image is being used and what it's communicating to the learner. You might try beginning with a prompt for the LLM to describe the image. After approving its description of the image—and it doesn't always "see" it correctly—you can provide context for the image's use and instruct the LLM to write Alt Text.

For the most helpful outputs, it's often necessary to tell the LLM the purpose of Alt Text and guidelines for writing it effectively, reminding it to focus on the meaning of what

it “sees” versus a comprehensive explanation of the image. The LLM will often generate multiple paragraphs to meet this goal if you fail to remind it that Alt Text should be concise. For those with GPT-4o, you can upload a document—a PowerPoint, PDF, or other file—and it will generate Alt Text for *all* of the images in it. This can be a huge time saver, especially if the images have shared context.

LLMs can also assist with captioning videos. Many apps allow you to input your video and generate captions—Veed.io is a favorite of many due to its ability to generate captions quickly and accurately (even removing filler words)—but one way LLMs can assist you is by editing auto-generated transcripts, providing you with a clean version to add to your editing program. LLMs excel at this type of editing and by prompting it to ask questions or indicate where it “guessed” on the transcription, you can improve its accuracy even more.

Sample LLM prompt:

You are an instructional designer who is generating alt text for this image used in a presentation for faculty members interested in research on gamification in STEM courses. The image is a diagram that models how to incorporate gamification into a college course and demonstrates how students can earn points. The purpose of this image is to demonstrate how the activities are scaffolded throughout the semester and the impact on the learner. Provide a clear, concise description that conveys the essential information of the image to someone who cannot see it.

22

Create Visual Representations of Data

Whether faculty members are conducting their own research or creating presentation materials for courses, many often require visual representations that convey findings, illustrate complex ideas, and facilitate better understanding of materials. In the past, we relied on various programs and tools to manually create these materials. Now many LLMs can create all sorts of charts, tables, diagrams, and more.

Generating visual representations of data and other work may require more LLM "training" than text-based tasks. Begin by including the basics—the persona the LLM should adopt, the task details, the image's purpose, and the format—then ask it to analyze your inputted data to determine the most effective way to visually represent the data, ensuring key points and findings are clear. Finally, prompt the LLM to ensure labels are included and the layout is clean and maintains academic standards.

After you've built your prompt, you'll find some LLMs have more sophisticated abilities to generate these types of visual representations. For example, GPT-4o allows you to

upload raw forms of data (such as, Excel files, Qualtrics data exports, CSV files, and JSON files) and can create a wide range of visualizations including waterfall charts, Sankey diagrams, paradigm diagrams, theoretical models, storyboards, scatter plots, and more. Claude 3.5 Sonnet can even create *interactive* visual representations. The free versions of Gemini and Copilot can also create many types of visual representations if you feed the data into the prompt (versus uploading it as a file). There are also a variety of apps trained on generating these materials that are effective in completing more complex tasks.

Sample LLM prompt:

As a professor, conducting in-depth research and publishing its results, your task is to generate a detailed visual representation of the data supplied below. The output should be clear, concise, suitable for academic journals, and helpful in explaining the results of this study. To accomplish that, please follow this process:

- Step One: Carefully analyze the research data to determine the most suitable type of visual representation.
- Step Two: Structure the data logically, ensuring all key points and findings are highlighted.
- Step Three: Add necessary titles, labels, annotations, and legends to make the visual easy to understand.
- Step Four: Ensure the layout is clean and avoids clutter, maintaining academic standards.

If you have questions on any step, ask for clarification before proceeding.

23

Develop Modules for Remediation or Study Skills

It is not uncommon for students to be underprepared for their classes. In some cases, they register for classes for which they've met the prerequisites, but they never mastered the fundamental skills they should have before taking the course. In other cases, they may be new to college (FTIC students) or new to the four-year institution (transfer students), in which case their lack of readiness might have more to do with not having adequate study skills or study habits. This could be because the challenge level was lower in previous contexts, so they never needed to develop these study skills. Of course, it's always possible for both scenarios to occur simultaneously, making it doubly challenging for an unprepared FTIC student to succeed. The most common courses to encounter these problems in the early college years are foreign language, science, and math courses, though many disciplines rely on basic arithmetic and algebra, and some students have forgotten basics such as multiplying or dividing fractions.

To meet the needs of students with these deficits, the simplest solution is to provide them with reminders of the basics they should have already mastered, ideally alongside

practice questions so they can have some assurance that they understand the concepts. It's time consuming to create a custom remediation module in the LMS, especially with practice questions. Fortunately, this is the sort of activity LLMs are good at. The same is true of a module that helps all students develop effective study habits. Many courses would benefit from having both types of modules available to students.

Sample LLM prompt:

You're an instructor in your third year of teaching college. Next semester you'll be teaching Calculus-1 for the second time, and you know from last year that many students lacked the math preparation for the course. Prepare an online module for the LMS that will review the basics from algebra and pre-calculus that students will use in Calc-1. Also include some foundational arithmetic such as order of operations. The basics should come in a numbered list, each with a label, a short definition, and an example. The module should be long enough that it would take 45 minutes for a student to review carefully. Also create 30 application-level multiple-choice questions to serve as a post-module quiz.

24

Invite a Virtual Guest "Speaker"

So many of us have daydreamed about the people we'd like to invite for coffee and the sorts of questions we'd ask them if we could just have an hour of their time. Often, we extend this wish list to include who we'd invite to class to discuss how they've impacted our work, provoked our curiosity, or been influential in our disciplines.

While (unfortunately?) AI tools won't evolve enough to transport a person into our classroom—or communicate with those who have passed on—it can adopt personas which simulate conversations and add to class discussions. Some apps, like Humy.ai, have hundreds of historical figures as personas who are already trained on their work, time period, and influence, and allow you to add your own course content or even create your own "expert" that students can engage with any time they have a question.

But it's not necessary to subscribe to an app to interact with a persona. All LLMs will respond to prompts that instruct them to act as widely known figures… and, if the expert you'd like students to converse worth isn't as well known, you can train the LLM on who the person is, what they've accomplished, and other content that would enrich the conversation. Claude allows you to upload a

PDF or other text-based document, simplifying the training process. For those who have Claude Pro, GPT-4o, Gemini Advanced, or Perplexity Pro, you can upload multiple documents and hundreds of pages of text.

When "hosting" this LLM "guest speaker" in class, you can engage students by having them ask the LLM questions, review its responses, and perhaps see if they can "trick" the LLM into providing false or misleading information. You may consider working with Pi, a LLM that has the ability to "voice" its responses and doesn't require a paid subscription to do so. While you'll still need to type in your part of the conversation, hearing the "expert" speak can add to class engagement. Students in online classes can be assigned to have a conversation with a LLM and turn in a copy of their chat and their reflections on its output.

Sample LLM prompt:

You are Ada Lovelace, a renowned mathematician and writer, known for your work on Charles Babbage's early mechanical general-purpose computer, the Analytical Engine. Today, you will have a conversation with a student who is eager to learn more about your life, your work, and your thoughts on various topics related to your field. Please respond to the student's questions as you would, using the knowledge and perspective that you had during your lifetime. [OR: Please base your responses solely on the content I provide here.]

25

Demonstrate Collaborative Storytelling

When we consider collaborative storytelling as a teaching tool, we tend to think of it as a pedagogical approach that works best with creative writing students or others in the humanities. But collaborative storytelling can engage students in all disciplines and help develop critical thinking and problem-solving skills while building communication and collaboration skills among students.

Collaborative storytelling is part of scenario-based learning and can be applied in almost any discipline. History students can explore different outcomes of events, re-enact historical moments, and pull on their knowledge of the subject matter to develop an accurate—or inaccurate—storyline. Science students can dip into sci-fi and generate plausible futuristic technologies. Business majors can create a start-up and market its launch. Environmental students can create realistic scenarios based on current data, and education students can develop storylines that put them in an IEP meeting with the student, their parents, and a counselor. (Need an idea for your own course? Ask a LLM to brainstorm with you.)

By its nature, collaborative storytelling invites group work and asking students to join together to create these prompts and participate in the process can build their teamwork skills. For multiple groups in a class, you could give students context for the task and then divide them into subgroups, assigning each different parts of the narrative (e.g., introduction, exposition, rising action, climax, resolution) while instructing them to use LLMs to generate character profiles, scenarios, dialogue, and other elements. After students have expanded from the LLM content and reflected on it and the process, they can present "in order" as the class sees how their work connects. Finally, a class discussion wraps up the activity and distills what students gained from the experience.

Sample LLM prompt:

You are an instructor of a college history class, and you've divided students into groups to collaboratively create a narrative around the signing of the Declaration of Independence. You will now generate dialogue and background information. Each group needs the following: (1) Profiles for key figures involved in the signing of the Declaration of Independence, including their backgrounds, personalities, and possible motivations; (2) Realistic dialogues between these figures discussing the main issues of the time, their concerns, and their visions for the future; and (3) Different scenarios and outcomes based on the signing of the Declaration of Independence, including alternative possibilities. Offer historical context students should consider while developing their narratives.

26

Design an Activity to Use the LLM as a Live Answer Generator

Many disciplines benefit from dialogical approaches, in which processes, assumptions, and even truths are questioned and debated in a discursive fashion. While faculty can lead such a conversation, in practice this often takes on the appearance of Socratic questioning, because the instructor can only be interacting with one person at a time. As a result, many students are reduced to a bystander role, though hopefully they are mentally following along (if not actively thinking through their own answers). The possibility of student inaction is the primary weakness of the instructor-centric approach.

If each student has access to an LLM, it's possible to re-envision the entire paradigm of dialogue and interaction. One at a time, each student can query the LLM about a given process being discussed in the current chapter and ask follow-up questions to fully understand the process as described by the LLM. Because AI output can sometimes be faulty, students should be watching for incomplete, inaccurate, or insufficient answers generated by the LLM,

perhaps identifying these weaknesses in groupwork with other students. The same could be done for assumptions or even conclusions/truths as understood for a given concept, as a way of re-examining what we know and how we know it.

Some LLMs will provide specific references used to arrive at the output, particularly if asked. These can be useful for the in-class activity described above, as a further method to impress upon students the need to find, document, and verify sources in the AI era.

Sample LLM prompt:

As an experienced instructor in higher education mechanical engineering, over the years you've seen many different pedagogies and activities in teaching. You've read about using LLMs to show students how to query a "knowledge source" about processes and then evaluate the answer, and you're curious to try it yourself. Design a student-facing activity in which they will individually query an LLM about a particular engineering design process, such as creating a robot that can collect loose basketballs and shoot them at a basket.

27

Design an Activity for Thought Experiments

One element of critical thinking that is ideal for advanced learners in higher level courses is the ability to conduct thought experiments and predict outcomes. Just as it can be difficult to write multiple-choice questions that measure higher-order thinking, it can be even more challenging to structure an activity for higher-order thought experiments. As a result, creating such activities without AI tools can be a time-consuming process.

LLMs can automate the brainstorming portion of designing thought experiments. As with many LLM prompts, it may be best to request "too many" examples at first, knowing that you can parse the output to find, with the help of your intuition won from years of experience, a winning final selection or two.

There are several ways to use thought experiments. One could request a detailed scenario from the LLM, in order to discuss the overall situation. It could be an effective groupwork exercise to ask students to predict an outcome, based on the situation described so far…and then circle

back one more time to an LLM to see if it agrees with the prediction.

Sample LLM prompt:

Pretend you are an instructor teaching a college Advertising class. You want to provide students with a detailed scenario so that they can predict possible outcomes from various proposed marketing campaigns. Write a one-page scenario that provides a lot of details about possible market trends and macroeconomic forces that might affect sales in the next six months of Smiley Pop, a fictional brand that is currently in second place in the national cola wars. Include at least three ideas for high-priced marketing campaigns that are being considered to boost additional sales in the face of market trends and the macro forces: one fairly standard, one original and ambitious but possibly risky, and one targeting teens specifically. The tone of your report should be brisk and full of details, with a "just the facts" approach. The audience for your report is the Smiley Pop CEO, who will be considering the various proposals in order to choose the winning marketing campaign.

28

Interact with Diverse Cultures

There's an old joke about two young fish who swim by an old man who asks, "How's the water today, boys?" The young fish respond, "What water?" It's difficult to understand other cultures and time periods because we're so immersed in our "realities" that we can't see the situations of others—or even ourselves—clearly. But, as educators, we know the importance of exposing students to all sorts of communities and experiences, especially as we move to a more globalized world.

Simulations can help build more empathetic students and enhance critical thinking, as students emerge themselves into other cultures and learn to analyze situations from multiple perspectives. They also allow students the opportunity to apply theoretical concepts learned in class and engage more actively in the material.

Perhaps subjects like anthropology and sociology are the most natural fits for this teaching approach, but many other disciplines can employ cultural simulation activities. Political science majors can visit the United Nations and simulate negotiations. Business, marketing, and economics students can launch products into other countries and alter their messaging to increase appeal. Writing and rhetoric

students can study idiomatic expressions, slang, and dialects unique to a culture. Education, social work, criminal justice majors, psychology, and more can practice recognizing, appreciating, and interacting with others in diverse environments.

Sample LLM prompt:

You are instructing a Global Studies course and are creating a cross-cultural communication workshop designed to navigate the nuances of international collaboration. Imagine an American tech startup and an Indian IT firm partnering to create innovative software. The American project manager, Emily Johnson, is direct, advocating for clear goals and swift progress. In contrast, Rajesh Kumar, the Indian team lead, promotes a more indirect approach, valuing team harmony and collective input. Choose to represent either Emily or Rajesh in a crucial project update meeting. If you are Emily, push for quick decisions to meet deadlines. If you are Rajesh, emphasize the importance of team consensus for quality results. Continue the discussion between Emily and Rajesh until they either come to an agreement or decide to end the negotiation.

Section II: Make Faculty Life Easier

29

Minimize Emails from Students

Teaching classes with smaller enrollments is often easier than classes with large numbers of students. The logistics of large classes frequently present more challenges, even if grading is done exclusively through automation within the LMS. The primary expression of this extra work is often the volume of emails from students, especially in large-enrollment courses that are conducted in a fully online, asynchronous modality, where students don't have another easy way to ask questions. One method to minimize student emails before the advent of AI was known as "three before me," which involved posting in an open topic Discussion Board and requiring students to direct their question to other students before emailing the instructor, and if they *still* needed to email the instructor, to link to the thread showing they had collected three opinions first.

And updated version of "three before me" in the era of GenAI could be even easier for students, since they could get answers right away. Instead of asking their peers via the Discussion Board, students could be directed to ask the LLM for their content questions. For questions about course procedures, students could visit Claude, Perplexity, or another LLM that accepts file uploads and upload the

class syllabus before asking their question. If they still need to email the instructor, a rule could be put in place mandating that students include a screenshot of first asking the LLM after uploading the syllabus. In this fashion, some students will get their answer right away and may never need to email the instructor. Instructors adopting this method might wish to provide students with a sample LLM prompt on the syllabus.

Sample LLM prompt:

Roleplay as the instructor of an undergraduate course named [Name of Course]. Your students have questions about an upcoming essay assignment. Scan the attached syllabus and determine the answers to the questions. Their main question is: [type question as it would have been phrased if emailed to the instructor]. Answer as the instructor might, with a particular eye toward syllabus policies and assignment descriptions.

30

Draft Your Annual Report

End-of-the-year reporting is part of faculty life. Departments, colleges, and institutions use annual reports to evaluate faculty members, but such reports may also be used when considering contract renewals or promotions. Some institutions may require faculty to complete a specific, mandated form, while others require faculty to prepare narrative statements that reflect their teaching, mentoring, outreach, and/or professional development activities. Reporting on efforts at the end of the academic year might not be a faculty member's ideal way of beginning the summer, but it is a required task that attests to the contributions made to the student experience and, therefore, to the reputation of the university by a faculty member.

If the prospect of drafting an annual report is daunting, LLMs can help! To start, faculty can use annual report templates available online to devise lists of work done for each category of their required annual report. Alternatively, faculty can ask an LLM to generate an annual report outline to complete. Once their outline is filled out as completely as possible, faculty can use LLMs to synthesize the information and compose a narrative paragraph that summarizes their work. Faculty members

who complete their outline or their mandated forms as documents or PDFs may be able to upload a copy of the outline or form to LLMs like Claude and Perplexity. Faculty can also cut and paste sections from their completed forms into the query box if the LLM doesn't have the ability to read a file. As always, giving the LLM an informative, clear prompt will help faculty maximize the LLM output to meet their annual report needs.

Sample LLM prompt:

You are a faculty member in counselor education who needs to write an annual report for end-of-the-year reporting. Using the attached outline, generate paragraphs that are each 100-150 words and focus on teaching, research, service, professional development, and outreach, respectively. The paragraphs will be evaluated by your department chair before they are sent to the provost, so they need to focus on how the work you did contributed to students' learning experience and to the reputation of the institution, which is considered research-intensive.

31

Summarize Commentary on Student Evaluations

Statistical data can help faculty see how they compare to other instructors in their department, college, and institution for the categories surveyed, but teachers would be wise to also consider the comments students submit, as they can be a rich resource for evaluating the effectiveness of course organization, teaching methods, and assignments. Reading the comments is not without its pitfalls, however. It can be nerve-wracking to read the critiques leveled by individual students, and the human tendency to remember the negative more than the positive may result in an instructor feeling angry, depressed, and anxious about their prospects for promotion and about teaching during the next term. How can faculty leverage student comments to determine what students find ineffective about their teaching without going down a shame spiral?

LLMs can be an effective tool for processing student commentary holistically because they are designed to identify and summarize patterns in language. Given the proper prompt(s), LLMs that accept uploads (such as, Claude, Perplexity, GPT-4o, and Gemini Advanced) can

provide faculty with a general idea of whether the student comments are positive or negative; pinpoint specific aspects of a course or teaching techniques that were (or weren't) particularly useful or conducive to learning; and compile suggestions students gave for improvement. Using AI in this way is, perhaps, something with which we are already familiar; online retailers have begun using LLMs to provide customers with a global snapshot of customer reviews. In a similar fashion, faculty can use LLMs to process student feedback and devise ways to improve their instruction more objectively, without the risk of losing the forest for the trees.

Sample LLM prompt:

You are a faculty member who taught three sections of introductory chemistry during the last semester. Your students left comments about the course and your teaching, and you want to know what students liked and did not like about the course and how you taught the material based on the attached file. Use the uploaded file to learn the following: a) what did students like about the course; b) what did students not like about the course; c) what suggestions did students give for improving the course; d) what did students like about your teaching; e) what did students not like about your teaching; f) what suggestions did students give for improving your teaching. Report your findings in a one-paragraph summary for each of the six categories (a-f). Finally, generate three ideas for how to improve the course and/or your teaching.

32

Automatically Take Minutes During Meetings

Faculty are required to attend various meetings during the academic year. How diligently individual faculty members take notes during these meetings can vary greatly, as can someone's ability to keep up with a discussion. Factors such as language issues, noise, technological glitches encountered during virtual meetings, and even illness can impact a faculty member's ability to understand or contribute to meetings.

Rather than attempting to keep up with meeting developments via hand-written or typed notes, faculty can enlist the help of an AI tool, such as Otter.ai or Read AI. However, there are some extremely important issues related to the use of AI for transcribing meetings that MUST be considered and approved before AI can be used for this purpose. The first consideration is ensuring that faculty have obtained consent by the other attendees to record or transcribe the meeting. People who have concerns about privacy, security, and litigation are likely to object to having AI do this work, while others may not be comfortable expressing their ideas if they know they are being recorded. Furthermore, not all AI programs

inform participants that they are being used. Faculty members who are interested in exploring AI transcription for their meetings are encouraged to be proactive about reviewing the protocols in place at their institution for this technology.

When (or if) faculty do obtain permission to transcribe meetings using AI, the analyses of the transcriptions can be facilitated by using LLMs. Uploading the transcription to LLMs like Claude, Perplexity, GPT-4o, or Gemini Advanced is typically preferable to copying and pasting the text, particularly given the character limitations of certain LLMs. To make the best use of LLM technology, faculty can prompt the LLM to provide a global summary of the meeting, list a specified number of important take-aways from the meeting, and generate a list of tasks to complete or questions to answer before the next meeting, if necessary.

Sample LLM prompt:

You are a faculty member who obtained the transcription of a meeting held during a day you were sick. Although you weren't at the meeting, you want to be sure you understand what topics were discussed, what questions were raised, and what solutions were offered. Using the attached text, generate a 250-word summary of the meeting, and generate a list of questions your colleagues asked, as well as the solutions to those questions that were offered. Finally, explain when the next meeting will occur (if known), and what tasks need to be done before it.

33

Summarize Long Emails

Email has made communication with others easy, but there can be some aggravating aspects to this form of communication. Not all emails are simple, direct, or limited to a single subject, and faculty members may find themselves ensnared in a message or message chain that is complex and difficult to keep track of. Despite their best efforts, it is entirely possible that faculty members neglect addressing important or time-sensitive questions. How can instructors keep track of the developments and priorities in such messages, particularly those that contain the thoughts and opinions of two or more other people?

LLMs can promote effective communication for faculty by generating email summaries. With an effective prompt, an LLM can analyze a long email (or chain), consolidate the main points of discussion, clarify the messages being sent and received, and, therefore, enhance the efficacy of their communication via email. LLMs can also help faculty more readily identify lingering questions and points of confusion or debate to provide guidance for moving the conversation forward toward resolution.

Depending on the size of the email chain, it might work to paste the conversation into an LLM. With a long enough

chain, it may be wise to use an LLM that accepts uploads, such as Claude, Perplexity, GPT-4o, or Gemini Advanced.

Sample LLM prompt:

You are a faculty member who is working on a proposal for a study abroad program to Peru. You have been discussing your proposal with the chair of your department and the study abroad staff, but the email chain is lengthy, and you are concerned you have not addressed all the parts of the program application or the concerns of your chair and the study abroad staff adequately or completely. You need to review the attached email messages and generate the following: a) a numbered list of priorities for the program that your chair has discussed; b) a numbered list of those parts of the study abroad program proposal that need to be further developed and what suggestions have been made for how to do this; and c) a numbered list of questions that have been asked but not answered in the email chain. Then, write a response email to everyone on the chain who asked a direct question or requested a response.

34

Draft Email Replies

Regardless of discipline, faculty must manage many interpersonal relationships. As with any relationship—personal or professional—good communication is critical. Responding to emails is an important daily task that faculty have to make time for, in addition to juggling class preparation, grading, meetings, and research. Failure to do so may result in the other party concluding that the faculty member is not interested in them or their issue, resulting in feelings of frustration or anxiety. The problem of time management for emails is particularly acute for teachers of large classes, especially if the instructor lacks adequate support of teaching assistants.

LLMs can help reduce the time and effort faculty put in to composing emails by generating an initial response that can be adjusted to fit their needs. Using AI in this way can help faculty respond in a timelier manner to messages and, therefore, convey an impression of interest in contributing to a larger discussion or concern in resolving a problem. Additionally, LLMs can help faculty members professionalize their response and help them avoid the pitfalls of impulsive, emotional, or world-weary communication with colleagues and students.

Sometimes it may be helpful to use an LLM that has access to the internet (such as, Copilot, GPT-4o, Gemini, and Perplexity) and prompt the LLM to also search the web in order to more fully respond to the inquiry.

Sample LLM prompt:

You are a faculty member in Biology who received an inquiry from a student who wants to know what the difference is between a Bachelor of Science and a Bachelor of Arts in Biology at your institution. The student does not understand the differences in course requirements for the two degrees. Write an email that describes the type of work done for each of the degrees and provides a list of questions that the student can answer to help them decide which degree program best suits their interests in Biology. The email should be factual and encouraging.

35

Adjust the Tone of a Draft Email

We previously discussed the importance of maintaining effective email communication, but many factors can influence the tone and temperature of an email: inter-office politics, the pressures of one's job, and personal stressors are just some examples. A whole host of issues may arise, for instance, if a faculty member's attempt at conveying enthusiasm is instead read as arrogance or insincerity. Another factor that can impact the comprehensibility of a message is its organization; messages that are difficult to follow can exacerbate feelings of confusion, rather than provide actionable solutions. How can faculty ensure that they don't come off as too aggressive, curt, disorganized, or annoyed in an email?

LLMs can help faculty adjust the tone of an email to ensure that a recipient does not misinterpret the intention of the message, and they can also be used to improve readability. Providing an email draft for the LLM to edit will allow the program to adjust words and phrases to ensure consistency of the tenor of a message or to regroup them to develop a message that is succinct and cogent. Furthermore, providing the LLM with an initial draft will guard against

it inventing scenarios, examples, or questions in its version of the email.

Remember that LLMs cannot provide you (or any other user) with personal opinions, so asking the LLM "Is this a good email?" is an ineffective use of the technology. You can prompt the LLM, however, to pinpoint areas of strengths and weaknesses in your communication (and overall writing) and ask for reasons why these sections were indicated.

Sample LLM prompt:

You are working on an application for a National Endowment for the Humanities grant that is due in five days. The colleague you are working with is overly concerned about the information in the budget justification section and you have drafted a reply, but you think the tone of the email you drafted is too harsh. Revise the attached email and make sure it has a professional, but firm tone so your colleague knows you have considered their concerns about the budget justification section, but that you think it is better to focus on developing the project's significance section because it isn't as refined as it should be, and you want to be sure to have time to edit the application before submitting it.

36

Compose a Letter of Recommendation

Faculty are often asked to write letters of recommendation (LOR) for students who are applying to graduate school or their first professional job. Although it can be flattering and rewarding to help students by providing an LOR, sometimes the timing of such requests makes crafting a thoughtful and effective letter inconvenient at best, and next to impossible at worst. The pressures of writing an LOR (or several) are often compounded by teaching duties, publishing deadlines, and personal dynamics that can limit a teacher's time and attention.

LLMs are very effective editing tools for faculty who are struggling to compose letters of recommendation. Once the LOR is drafted, faculty can prompt the LLM to improve the structure, clarity, and appropriateness of the letter to ensure that it highlights the qualities sought by an organization. A carefully worded prompt can help the LLM best understand the assignment; the LOR it generates for a law school applicant, for example, would be necessarily quite different than one edited for a student who is applying to a Master of Fine Arts program. Of course, faculty are strongly encouraged to review the

LLM-revised letter to ensure accuracy and tone, and to reveal any biases. (LLMs often produce output that includes gender stereotypes, such as referring to students with traditionally female names as "nurturing" and "supportive" while categorizing the same behaviors in males as "strong team players.") Faculty should be sure that the letter accurately describes a student as they know them, and selectively reworking the LLM's phrasing will make the letter sound more authentic.

Sample LLM prompt:

You are a language teacher who has been asked by a student to write a 1-2 page letter of recommendation for their application to a military officer training program. The student took two of your classes and they were a good student in your classes, earning Bs both semesters. You respect the student's efforts; you know the student to be hard-working and engaged in their learning, despite the financial/personal difficulties they experienced during your classes. Edit the copy of the attached letter to focus on the student's work ethic, skills, and academic discipline. Be sure to highlight the experiences mentioned in the draft that follows this prompt to enhance the letter of recommendation you submit on your student's behalf.

37

Assist with Dossiers

Dossiers and portfolios are valued assessment tools in the field of teaching and learning. Faculty members may use dossiers to track and assess student learning, but too often we're also asked to submit a portfolio when we apply for promotions, tenure, or awards. Alternatively, faculty may be asked to contribute to departmental reports by summarizing or synthesizing data that demonstrates the effectiveness of courses and curricula. The time it takes to compile, organize, and process files for such work is significant, and faculty may find the additional task of writing a compelling summary or description for each section overwhelming.

The ability of LLMs to process information from multiple sources can be a boon for faculty who are feeling stressed or exasperated by the process of dossier compilation and synthesis. LLMs are excellent at synthesizing information and can quickly compose a summary of their individual work or the work done by all members of a department. For dossiers that require the analysis of multiple materials—such as, effectiveness reports based on several years of program assessments—investing in Claude Pro, Gemini Advanced, Perplexity Pro, or GPT-4o may be beneficial. All three LLMs allow you to upload multiple

files and large amounts of text. While LLMs consider input "tokens" which don't translate neatly into page numbers, GPT-4o can read around 250 pages while Claude Opus (part of Claude Pro) can read up to 400 pages.

Another possible use of LLMs for dossiers is submitting a prepared portfolio as a document or PDF and asking the LLM to identify areas of strengths and weaknesses given the rubric that will be used to assess the faculty's submission. This use of AI can be particularly beneficial to faculty members who are uncertain if they have addressed all the areas required for a dossier submission.

Sample LLM prompt:

You are an instructor of Digital Media. Your department at the university is undergoing an audit as part of an Institutional Effectiveness review. You have been asked by the coordinator for your department to contribute to the preparations by supplying a dossier review of the work completed by students graduating from your program during the past four years, and you are given copies of the assessment reports that have been submitted to review and write up. You must submit the following: 1) a 300-word summary of your department mission statement and how the work submitted by graduates in your program exemplifies the mission statement; 2) a 500-word summary of the data contained in the assessment reports; 3) a 300-word discussion of the three largest factors that influence students' grades for the targeted skills, based on the data from the assessment reports.

38

Improve Dossiers for Awards and Promotion

One of the more time-consuming tasks for educators is creating a comprehensive portfolio that highlights our research, academic achievements, publications, and teaching philosophies. Often, we're asked to generate additional materials as well to demonstrate our impact on students, our institution, and our academic and civic communities.

Compiling and shaping a narrative out of these materials—especially for reviewers who may not be in our disciplines—can be a daunting task. LLMs shine when it comes to summarizing and synthesizing text, and they also excel at reviewing materials, identifying gaps or missing information, and comparing and contrasting materials as they relate to readers within—and outside—of our disciplines.

After working with a LLM to generate your dossier—as discussed in the previous chapter—you can then upload award criteria and other guidelines and ask the LLM to review your work from this lens. If you're presenting this dossier to members outside of your area of expertise, it can

be helpful to point out areas that might be confusing to those unfamiliar with your subject matter and to offer suggestions for clarifying key points. If the dossiers of faculty members who have won in previous years are posted publicly, you can ask the LLM to compare them with your own work and brainstorm ways you can supplement your dossier.

Sample LLM prompt:

You are a committee reviewer tasked with reviewing my award dossier that highlights my research, academic achievements, publications, and teaching philosophies. This portfolio is intended to demonstrate my impact on students, my institution, and my academic community. I need your assistance to review the entire portfolio and summarize the key points, identify any gaps or missing information, and compare my dossier with those of faculty members who have won awards in previous years (if available). Additionally, please review the dossier from the perspective of the award criteria and guidelines provided [upload award criteria and guidelines]. Highlight areas that might be confusing to reviewers outside of my discipline and offer suggestions for clarifying these points. Provide a detailed analysis and suggestions for improvement.

39

Market Your Course/Program

One of the constant considerations of teaching is how to adapt to meet the changing needs and interests of students. So often we'll work to add a new certificate or program—or we'll shake up our special topics course by adopting a theme like *The Hunger Games*—only to discover that students aren't aware of the options we've created.

Marketing our courses, programs, and other additions to our departments becomes an essential part of the process. LLMs excel at brainstorming and are good at synthesizing and summarizing information. If you input your course description, syllabus, and other relevant materials, you can ask the LLM to create marketing materials, such as emails to students, content for flyers, and social media ads (and hashtags) that attract students.

Some LLMs' free versions—such as, Copilot and Gemini—generate images, allowing you to easily prompt the LLM to create images to accompany your materials. GPT-4o and Adobe Express can go a step further and, after creating images and content, generate a completed flyer or other marketing tool that you can easily download and use.

Sample LLM prompt:

You are designing marketing materials for a new special topics course. The syllabus and course description have been uploaded. This interdisciplinary course uses *The Hunger Games* as a lens for political analysis, exploring themes such as power, resistance, and societal structures. Create engaging marketing copy for Instagram (caption and hashtags), Facebook (event description and details), Twitter/X (short post and hashtags), TikTok (short video script and hashtags), and a flyer (title, description, schedule, instructor, enrollment info, and call to action) based on the provided syllabus and course description. Finally, you'll suggest and generate three images to use with these materials.

Section III: Make Research Easier

40

Find Seminal Publications in a New Research Area

One of the primary challenges faculty researchers face when expanding their research purview into a new area is identifying authors and publications at the leading edge of the conversation. The large number of academic contributions makes it difficult to pinpoint the most influential and foundational works. Traditional methods, such as combing through databases and manually reviewing citations, are time-consuming and often result in an overwhelming amount of information, much of which may not be directly relevant. This inefficiency can hinder the initial stages of research, delaying the development of a comprehensive understanding of the field. Additionally, the sheer volume of new publications can make it difficult to stay updated with the latest advancements and understand how they build on or diverge from established research.

While LLMs can identify key words, trends, and topics, they don't yet access academic databases well and they still frequently hallucinate sources, DOIs, and publication details. But there are a series of research tools that are

powered by AI that are dramatically expediting—and improving—the academic research process. Some of our favorites include Semantic Scholar (an AI-powered search engine for scientific literature); ResearchRabbit (a "forever free" app that searches and monitors new papers); Elict (a research assistant that compiles and sorts specific data from journals); and Consensus AI (an extensive collection of peer-reviewed papers with intuitive search capabilities). See "Section IV: Tools Worth Considering" for details.

LLMs that allow you to attach documents (GPT-4o, Claude, and Perplexity) can assist these apps and help researchers (and students) understand the context and significance of particular studies within the broader landscape of the field. They can also summarize large articles and ferret out specific information.

Sample LLM prompt:

You are a researcher who is writing a lit review on organizational change for your own research that compares the effectiveness of qualitative and quantitative methods. First, summarize each article. Then, extract the methodology used and separate into 3 categories: qualitative, quantitative, and other, and list the strengths and weaknesses of each.

41

Consolidate Research for a Lit Review

Conducting a scholarly literature review can be very time consuming. The task requires a high degree of consistent focus and critical reading yet an openness to make creative connections or follow promising new ideas and perspectives. Given the demands on time and cognitive load for today's busy faculty researchers, LLMs can add efficiency, accuracy, and representation of perspectives to a literature review.

LLMs like Elicit, Consensus, Research Rabbit, Perplexity, or Semantic Scholar can be leveraged to reduce some of the inefficiencies of conducting a manual review. LLMs can not only scan and summarize a vast collection of journal articles quickly, but they can also be prompted to ensure a more comprehensive and representative selection of relevant studies. They can better identify patterns and trends leading to greater accuracy and objectivity in the synthesis, and they can be directed to edit multiple entries for consistency in style and formatting. LLMs can condense long articles to extract key findings, highlight core arguments, and identify methodologies. They can perform a meta-analysis by identifying gaps or patterns

across studies. They can categorize and organize the literature chronologically or by theme, and they can create initial drafts of the sections of the lit review. When tools like Zotero or EndNote are enhanced with AI capabilities, they can also help manage and organize references. Some LLMs like Claude Pro, GPT-4o, Gemini Advanced, and Perplexity Pro allow you to upload multiple PDFs and other files which makes it even easier to synthesize multiple sources, search for keywords, and filter articles based on your sorting preferences (research question, sample size, recommendations, etc.).

Sample LLM prompt:

You are a college instructor researching attachment disorders in young adults. You need to write a comprehensive scholarly literature review. Write short reviews for the attached peer-reviewed articles and then create an outline to assist with writing a lit review. The review should include an introduction, key themes and findings, methodologies, gaps in the literature and a conclusion that suggests potential directions for future research. The output should be organized in APA 7e style requirements and should be written for expert researchers and practitioners, and should clearly indicate where each article should be mentioned or considered.

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Brainstorm Ideas for a New Publication

Proposing new ideas for grants, articles, or book projects is sometimes a significant challenge for researchers across all fields. The process requires not only a deep understanding of the existing body of literature but also the ability to identify gaps and propose novel contributions. This can be particularly daunting given the sheer volume of published research and the rapid pace at which new findings emerge. Additionally, researchers often need to balance originality with feasibility, ensuring that their proposals are innovative yet grounded in achievable methodologies. The pressure to stand out in competitive funding or publication environments further exacerbates these challenges, making the ideation phase both critical and demanding.

LLMs offer a transformative solution for researchers seeking to generate and refine ideas for their projects. LLMs can analyze vast amounts of literature, identifying trends, gaps, and emerging areas of interest. These models can provide insights into how different research questions have been approached, suggest potential methodologies, and even propose new angles on established topics. For instance, an LLM can help a researcher by highlighting

underexplored intersections between disciplines, suggesting novel applications of existing theories, or identifying emerging questions that have yet to be addressed. This capability not only accelerates the ideation process but also enhances the quality and originality of research proposals. By leveraging LLMs, researchers can efficiently navigate the extensive body of existing work and generate well-informed, innovative ideas that stand a better chance of success in competitive environments.

Sample LLM prompt:

You are a research faculty member with a doctorate in philosophy, and you are working in an interdisciplinary faculty cluster at a university. Your team focuses on ethical issues in technologies, and recent advances in artificial intelligence proposes many ethical challenges. Your task is to generate a list of innovative research ideas in the field of artificial intelligence ethics, focusing on underexplored intersections with social justice, environmental sustainability, and global governance. For each idea, provide a brief overview of the current state of research, potential research questions, and suggested methodolo*g*ies.

43

Create an Outline of a Grant Application

Outlining a new grant proposal is a complex and often daunting task for researchers. It requires a thorough understanding of the current state of research, identification of significant gaps or opportunities, and the articulation of a clear and compelling narrative that aligns with the priorities of funding agencies. The process involves extensive literature review, careful consideration of methodological approaches, and the ability to project potential impacts and outcomes convincingly. Additionally, researchers must navigate the specific requirements and guidelines of different funding bodies, which can vary significantly. The pressure to secure funding in a highly competitive environment adds another layer of difficulty, making it crucial to develop a well-structured and persuasive proposal.

Large Language Models offer a powerful tool for researchers looking to streamline the process of creating grant proposal outlines. By leveraging advanced natural language processing, LLMs can quickly analyze vast amounts of literature and funding agency guidelines to provide targeted insights and recommendations. These

models can help identify key research gaps, suggest innovative methodologies, and propose potential impacts and outcomes based on existing research trends. LLMs can also assist in aligning the proposal with the specific requirements and priorities of various funding agencies by analyzing successful proposals and extracting common elements and strategies. This not only saves time but also enhances the quality and coherence of the proposal, increasing the chances of securing funding. By using LLMs, researchers can efficiently develop a structured and comprehensive outline that serves as a strong foundation for their grant proposals.

Sample LLM prompt:

You are a researcher in the field of Green Finance, and you have an idea for a grant project. Your task is to create a detailed outline for a grant proposal in the field of renewable energy, focusing on innovative solutions for solar energy storage. The outline should include sections on background and significance, specific aims, research design and methods, expected outcomes, and potential impact. Additionally, provide guidance on aligning the proposal with the priorities of major funding agencies such as the National Science Foundation (NSF) and the Department of Energy (DOE).

44

Compose the First Draft of a Grant Application

Writing the first draft of a grant proposal presents numerous challenges for researchers. This initial stage involves transforming a conceptual idea into a structured document that clearly articulates the research objectives, significance, methodology, and expected outcomes. Researchers must ensure that their proposals are both scientifically rigorous and persuasive, making a compelling case for funding. This process requires meticulous attention to detail, including adherence to specific formatting and submission guidelines of various funding agencies. Additionally, the pressure to secure funding often leads to heightened anxiety, making it difficult to maintain clarity and focus during the drafting process. The result is that many researchers find themselves overwhelmed by the sheer scope of the task.

Large Language Models can significantly ease the burden of writing the first draft of a grant proposal. By utilizing advanced natural language processing capabilities, LLMs can generate coherent and well-structured text based on input provided by the researcher. These models can help organize ideas, ensure logical flow, and maintain a

persuasive tone throughout the document. LLMs can also assist in crafting specific sections of the proposal, such as the background, literature review, methodology, and anticipated outcomes, by drawing on a vast database of existing research and best practices. Furthermore, LLMs can provide suggestions for meeting the specific requirements and priorities of different funding agencies, enhancing the alignment and relevance of the proposal. By leveraging LLMs, researchers can expedite the drafting process, reduce cognitive load, and produce higher-quality first drafts that stand a better chance of success in competitive funding environments.

Note: researchers should verify before beginning that the use of GenAI is allowed under the grant.

Sample LLM prompt:

You are a researcher in the area of integrative medicine, and you are seeking funding for a study of non-drug related interventions to improve human health. Your task is to draft the first section of a grant proposal for a research project focused on developing innovative alternative therapies for obesity-related diseases. The draft should include an introduction, background information, a review of relevant literature, and the research objectives. Additionally, provide suggestions for aligning the proposal with the priorities of major funding agencies such as the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC).

45

Improve Grant Applications with Comparisons

One of the perennial challenges in grant writing is ensuring that a proposal stands out while adhering to the stringent criteria set by funding bodies. Researchers often need to compare their proposals with successful applications from previous years and align them with the specific requirements and expectations of the grant. This process is labor intensive and fraught with the difficulty of parsing through voluminous documents to extract relevant information, making it challenging to identify gaps, strengths, and areas for improvement in one's proposal.

LLMs like GPT-4o, Claude Pro, Gemini Advanced, and Perplexity Pro offer a transformative approach to this problem by leveraging advanced natural language processing capabilities. These models can swiftly analyze and synthesize information from multiple documents, enabling researchers to gain a comprehensive understanding of the key elements found in successful proposals. By inputting both the draft proposal and the successful ones into an LLM, the model can perform a detailed comparison, highlighting discrepancies in language, structure, and content. This comparative analysis

helps identify areas where the draft falls short and suggests specific enhancements that align it more closely with the successful examples. Furthermore, LLMs can cross-reference the draft proposal with the grant criteria, providing a meticulous check to ensure that all necessary components are addressed. This includes verifying the presence of essential sections such as the introduction, literature review, methodology, expected outcomes, and budget justification, and ensuring that each section meets the funder's expectations. The model can also suggest improvements in clarity, coherence, and persuasiveness, which are critical factors in the evaluation process.

Sample LLM prompt:

You are an experienced grant writer who is mentoring a junior faculty member trying to secure funding for a research project. Your task is to analyze the following grant proposal draft and compare it with successful grant applications from previous years (also attached). Identify the strengths and weaknesses of the draft in relation to the successful ones. Additionally, cross-check the draft with the specified grant criteria and provide detailed suggestions on how to improve the proposal to meet or exceed the funder's expectations. Ensure the analysis covers all major sections, including the introduction, literature review, methodology, expected outcomes, and budget justification.

46

Adjust Length of a Grant Application

One of the significant challenges researchers face when editing a grant proposal is adhering to the strict space requirements set forth by granting agencies. These constraints often necessitate precise and strategic editing to ensure that the proposal remains comprehensive and compelling while fitting within the specified limits. Balancing the need to include all essential information with the requirement to keep the text concise can be daunting. Researchers must decide which sections to condense without losing critical details and which areas may need further elaboration to meet the grant criteria effectively.

Large Language Models (LLMs) like ChatGPT offer a powerful solution to this problem by assisting in the precise editing and optimization of grant proposals. These models can analyze the text to identify which sections can be succinctly summarized without omitting vital information, ensuring that the proposal remains impactful while meeting space constraints. Conversely, LLMs can also identify areas that might benefit from further elaboration, enhancing clarity and completeness. By

providing tailored suggestions, LLMs help maintain the proposal's overall quality and coherence, ensuring that all necessary details are included in a concise manner that aligns with the funder's expectations.

Sample LLM prompt:

You are a recently appointed female faculty member in Aerospace Engineering, and you have written a first draft of a proposal for an NSF CAREER grant. Analyze the following (or attached) grant proposal draft, considering the space limitations imposed by the granting agency. Identify sections that can be shortened without losing essential information and suggest concise edits. Additionally, highlight areas that may need further elaboration to meet the funder's criteria more effectively. Provide detailed recommendations on how to balance the content to ensure clarity, completeness, and alignment with the grant requirements, focusing on the introduction, literature review, methodology, expected outcomes, and budget justification.

47

Unify the Tone of Co-Authored Drafts

Editing a research publication with multiple authors requires an experienced wordsmith to effectively blend each contributor's unique voice, writing style, and perspective, without which could often result in a disjointed and inconsistent final manuscript. Achieving a uniform tone and style is essential for readability and coherence, yet it often requires extensive revisions and a keen editorial eye. The complexity increases when authors are from diverse disciplines or linguistic backgrounds, further complicating the harmonization of the text. These challenges can lead to a prolonged editing process, consuming valuable time and resources. Also, the iterative nature of academic writing, where feedback and revisions are continuously incorporated, adds another layer of difficulty in maintaining a consistent style. The pressure to meet publication deadlines while ensuring high-quality output exacerbates these challenges, highlighting the need for an efficient and effective solution.

LLMs can help facilitate the editing task by analyzing and understanding the nuances of different writing styles and tones. They can assist in editing the publication to ensure

consistency in style and semantic density, making the text more coherent and accessible. They can identify and correct stylistic discrepancies, standardize terminology, and enhance the overall readability of the manuscript. This not only saves time but also improves the quality of the final document, ensuring it meets the high standards required for academic publications. They can also provide valuable insights into the text's structure and content, suggesting improvements that might not be immediately apparent. The result should be a polished and professional publication that effectively conveys the research findings.

Sample LLM prompt:

You are a principal investigator working with several co-PI's on an international project, and each has contributed to a draft narrative. English is not the first language for any of the authors. Your task is to review the following research manuscript and make edits to ensure a consistent writing style and tone throughout the document. Focus on harmonizing the language, standardizing terminology, and improving readability. Pay special attention to sections where different authors' writing styles might clash and make adjustments to ensure a seamless narrative. Additionally, enhance the semantic density by ensuring that key concepts and arguments are clearly articulated and supported. Highlight any significant changes made and provide a brief explanation for each major edit.

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Double-Check a Proposal Against the Original CFP

Proposing a conference presentation for a prestigious academic conference is a highly competitive and rigorous process. The event attracts submissions from leading experts and scholars worldwide, making it crucial to stand out with a compelling and well-structured proposal. One of the significant challenges is ensuring that your proposal aligns with the current trends and topics of interest within the field, while also clearly demonstrating the relevance and impact of your research. The proposal must effectively communicate your research objectives, methods, and anticipated outcomes in a concise and engaging manner. The pressure to meet these high standards, coupled with the need for precision and clarity, often results in a failed proposal. This challenge is compounded by the necessity to balance technical language with accessibility, making sure that the content is understandable to both specialists and a broader academic audience.

LLMs can guide you through the proposal writing process so you can generate a proposal that is not only coherent and well-structured but also tailored to the specific requirements and expectations of the conference. LLMs

can help you articulate your research objectives, methods, and anticipated outcomes in a clear and compelling manner. They can analyze existing literature and identify key themes and gaps that your research addresses, ensuring that your proposal highlights its significance and contribution to the field. Additionally, they can assist in refining your proposal by suggesting improvements in language, tone, and style, ensuring that your submission is professional and impactful. This process includes optimizing the abstract, structuring the sections logically, and providing persuasive arguments that emphasize the importance and novelty of your work.

Sample LLM prompt:

You are a faculty researcher of workplace equity in large corporations, and your work centers on the impact of remote work. You wish to present your research at the annual conference of the Society for Industrial and Organizational Psychology. Your task is draft a proposal for a conference presentation at this upcoming SIOP conference with the topic of "The Impact of Remote Work on the Well-Being, Productivity, and Career Longevity of Women Managers." Ensure that the proposal includes a clear statement of the research problem, objectives, methodology, and anticipated outcomes. Highlight the significance of this research in the context of current trends in remote work and its implications for organizational practices. Make sure the language is professional, engaging, and tailored to the expectations of the SIOP conference review committee.

49

Tailor Your Bio for New Contexts

One of the crucial aspects of preparing for a significant professional opportunity is customizing your bio to highlight the key points of your work and meet the audience's expectations. A well-crafted bio not only introduces you but also sets the tone for establishing your credibility and engaging the audience from the outset. It's important to emphasize your relevant expertise, notable achievements, and any unique perspectives or experiences that directly relate to the topic. This tailored approach helps create a connection with your audience and ensures that your bio aligns with the theme and goals of the event. Failing to customize your bio might result in a missed opportunity to effectively convey your qualifications and the significance of your work, potentially diminishing the impact of your presentation.

LLMs can create a bio that is coherent, engaging, and tailored to the specific audience and context of a meeting, online post, or publication. They can emphasize your most relevant qualifications and achievements, ensuring that your bio resonates with the audience and underscores your authority on the subject matter. They can assist in refining

the language and tone of your bio, making sure it is professional yet approachable and aligns with expectations. This not only enhances your introduction but also positively influences the audience's perception and sets the stage for a successful impression. By using LLMs, you can ensure that every aspect of your bio is optimized to capture the audience's interest and convey the importance of your contributions to the field.

Sample LLM prompt:

You are a seasoned faculty member and considered an expert in multiple fields of human communication. Your task is to write a speaker bio for keynote address at an upcoming IEEE GLOBECOM conference, and the title of the presentation is "A Failure to Communicate: Progress in Communication Technologies and Regress in Negotiation Skills." Scan the attached C.V. for details relevant to this topic. Include my academic and professional background, highlighting my expertise, notable achievements, and any relevant research or projects. Ensure the bio is engaging, professional, and tailored to meet the expectations of the audience attending this professional meeting.

50

Create a Report from Raw Survey Data

Even with advanced statistical tools, analyzing large amounts of survey data can be an arduous and error-prone task. Common pitfalls include overlooking key patterns, misinterpreting responses, and the sheer volume of data making it difficult to draw accurate conclusions. Manually sifting through open-ended responses, categorizing them, and ensuring that all relevant themes are captured requires significant time and effort. The complexity increases when dealing with diverse responses that may include varying degrees of detail, different terminologies, and subtle nuances that are easy to miss. Ensuring consistency in interpretation and presentation of the data can be challenging, particularly when multiple researchers are involved, each bringing their subjective biases and perspectives. These challenges often lead to delays in reporting and can compromise the quality and reliability of the findings.

LLMs can streamline the analysis of survey data and the creation of summary reports by processing vast amounts of text data quickly and accurately, identifying patterns and themes in open-ended responses that might be missed in

manual analysis, categorizing responses, quantifying sentiments, and highlighting significant trends. This allows researchers to gain deeper insights into the data and produce more accurate and comprehensive reports. They can reduce the influence of individual biases and ensuring a more objective interpretation of the data. This technology can also handle complex linguistic nuances, enabling a more nuanced understanding of respondent feedback. LLMs can assist in writing these reports by summarizing findings in a clear and coherent manner, ensuring consistency and professionalism in presentation. The ability to automate these tasks not only saves time but also enhances the overall quality and reliability of the research outcomes. (GPT-4o allows you to attach raw data from multiple files in all sorts of formats, including CSV, Excel, JSON, and text, saving even more time.)

Sample LLM prompt:

You are a graduate research assistant supporting a team of faculty researchers who surveyed tourists to the Central Florida area over the past five years. Many of the survey fields called for respondents to generate text responses. Your task is to analyze the attached survey data, which includes both quantitative and open-ended responses. Identify key patterns and themes in the open-ended responses, categorize them appropriately, and quantify any recurring sentiments. Summarize the findings in a detailed report, highlighting significant trends and insights. Ensure the report includes an introduction, methodology, results, and conclusion sections, and is written in a clear and professional tone suitable for academic publication.

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Generate “Extras” for Your Research Paper Draft

Writing critical components such as keywords, abstracts, conclusions, marketing copy, letters to editors, and submission lists for research papers can be a complex and time-consuming process. Common pitfalls include selecting keywords that fail to capture the essence of the research, drafting abstracts that are either too detailed or too vague, and writing conclusions that do not adequately summarize the findings. Creating engaging marketing copy that highlights the significance of the research for a broader audience can be particularly challenging, as can crafting a persuasive letter to the editor. These tasks require precision, coherence, and a deep understanding of both the research and its potential audience, making them prone to inconsistencies and errors when done manually.

LLMs can generate high-quality keywords, abstracts, conclusions, and other essential documents with great accuracy and coherence. They can analyze the content of a research paper, identify its key themes and contributions, and produce concise and relevant keywords that enhance discoverability. They can draft abstracts that succinctly summarize the research while highlighting its importance

and main findings. Conclusions generated by LLMs can effectively encapsulate the implications and future directions of the study. LLMs can create compelling marketing copy that captures the interest of a broader audience and write persuasive letters to editors that emphasize the paper's relevance and impact. Some AI apps like Trinka have a "journal finder" that generates a curated list of suitable journals and conferences for submission, based on the paper's subject matter and quality. scite Assistant is another helpful tool that analyzes your citations and indicates those which have been challenged, supported, and retracted, ensuring the quality of the research you refer to in your own work.

Sample LLM prompt:

You would like to publish a completed research paper, and you want to maximize your efforts toward a successful submission to the top journals in the field of international relations. Your task is to analyze the attached research paper and generate the following documents: 1) a list of relevant keywords that capture the essence of the research, 2) a succinct abstract summarizing the research objectives, methods, findings, and significance, 3) a concise conclusion that highlights the main findings and their implications, 4) marketing copy that effectively communicates the importance of the research to a general audience, and 5) a persuasive letter to the editor emphasizing the paper's relevance and contributions. Ensure that each document is clear, coherent, and tailored to its specific purpose.

Section IV: Tools Worth Considering

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Adobe Firefly

Create Consistent (Themed) Images for a Presentation

While several tools, apps, and websites offer text-to-image capability (creating GenAI images), most of them re-invent the interpretation of the text anew with each new image generation. Let's say you created an image of a cartoon eagle at a typical generator (for example, Copilot who uses DALL·E 3), and you liked the way it looked. If you wanted to use that eagle as a consistent mascot for an entire PowerPoint presentation, you might find it difficult for Copilot to reproduce the same style of cartoon eagle as the first one you liked. Asking for a cartoon eagle riding a bicycle for your second slide will result in brand new designs for cartoon eagles, so the theme is not consistent.

Adobe Firefly offers a functionality that will solve this problem. In addition to style pre-sets, it also offers a "reference image" upload, where you can import a starting image you like, and subsequent text-to-image prompts will mimic the style and look of the reference image, as if they were created by the same artist. This works especially well if the reference image were created with a detailed prompt

in Adobe Firefly the first time, and the relevant details of the prompt are repeated in future prompts along with the uploaded reference image.

In this fashion, you can get the same cartoon eagle appearing throughout your PowerPoint presentation while doing different things that align with each slide's unique content, such as flying a kite while lightning zaps an attached key, peering into a microscope to unlock the mysteries of DNA, or signing the Declaration of Independence alongside other cartoon animals.

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ResearchRabbit

Visualize Research Connections and Quickly Connect to Academic Sources

Too often students rely on Google—or Google Scholar, if we're lucky—to find sources that can contribute to an academic conversation. Many of these sources fall short and those that might be helpful often lead to abstracts that require library logins or payments before proceeding. Even the quality sources we may obtain there—or in other industry-specific shared collections or digital libraries—don't always show us how other researchers are contributing to the conversation.

ResearchRabbit is a "free forever" innovative, citation-based literature mapping tool that's designed to support your research without switching between search modes and databases. But it's ResearchRabbit's ability to automate "citation mining," highlight relationships and trends, and quickly lead you to relevant research (which might not be immediately obvious) that makes it a true game changer.

ResearchRabbit provides a visual map of the literature that reveals the structure of research networks and allows

researchers to see how papers are connected. Closely-related papers cluster together, allowing you to easily identify papers central to the discussion. The visual format also allows researchers to spot trends, dominant theories, and gaps where little research has been conducted.

With ResearchRabbit, you can interact with these filters by selecting specific journals and tracking where they've been cited. Or you can filter by criteria (i.e., publication date, number of citations, keywords) and zoom in—or out—to understand the research connection or to limit your scope.

As you continue to use ResearchRabbit, it begins to tailor its suggestions based on user preferences or research history, personalizing your searches. You can even ask the app to email you when a related study is first published.

After you've added articles to your collection, you can export all of the papers at once, share that collection with collaborators or use it to build a course reading list for students, and sync it with Zotero collections.

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Elicit

Quickly Extract Specific Data from Relevant Research

Elicit is another AI-powered research tool that assists in streamlining the literature review process. You can begin by entering a research question to generate a search process or you can upload a document and extract data from it.

When you initiate a search, Elicit pulls up the four most relevant articles and generates a mini literature review that shows how these four studies are related. The app then creates a table of all four articles that includes the citation information and a one-sentence abstract summary. You can create columns that allow you to search for over 30 types of specific data, such as limitations, measured outcomes, intervention effects, methodology, research gaps, funding sources, software used, sample sizes, and more. This ability is particularly useful for meta-analyses and systemic reviews and saves countless hours for researchers who are interested in specifics within a research study.

After reviewing the four papers Elicit suggested, you can keep selecting "Load more" until you run out of time or energy. Elicit organizes its search by relevance, so having a strong research question for the initial inquiry is critical for building a collection of papers.

Like ResearchRabbit, Elicit encourages collaboration and allows you to share your "Notebook" with colleagues and students, and it also syncs with Zotero. Elicit will save your results, but it does not, unfortunately, allow you to export your data, tables, columns, or citations for free. Researchers who desire that option will need to purchase Elicit Plus.

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Consensus

Quickly Firm Up Relevant Research Questions

Consensus is an AI-powered search engine that combs through over 200 million academic research articles, papers, and books in every academic discipline. Powered by Copilot and their "Consensus Meter," this tool allows you to enter your research question, pull up relevant work, and view an AI-generated Study Snapshot that extracts key information about a study's methods and can quickly reveal the strength of your research questions based on verified data.

Displayed sources include a one-sentence review that summarizes the key findings of the study which may greatly assist in the search process. Consensus also flags other aspects of the study that might be relevant to researchers, including if it's highly cited, a randomized controlled trial, published in a rigorous journal, or a systemic review.

Consensus has free and premium options but allows unlimited searches and the ability to export research lists in all of its packages.

Conclusion

As mentioned in the introduction, we view this book as a companion to our 2023 open-source book *ChatGPT Assignments to Use in Your Classroom Today* (http://bit.ly/chatgptassignments). Whereas the first book set out to offer examples of student-facing assignments that made use of LLMs, this book is aimed instead at ways faculty can use LLMs in their own working lives. Some of that is by necessity aligned with their lives as teachers, but we wanted to expand the view to include 'hacks' involving faculty as researchers or just their overall productivity in other elements such as service or their lives as employees of institutions of higher education.

Ethical Use of GenAI

A few of the examples of hacks discussed in earlier chapters made oblique references to ethics, but a deeper reflection is certainly warranted. Just as faculty expect students to be transparent and ethical with GenAI tools—and to avoid any unethical practices—we should hold ourselves to the same high standards. Unfortunately, the easy comparisons end there. With students, it's relatively simple to see the dividing line between ethical and unethical use, particularly if students are told on the syllabus exactly where to draw that line in a particular class. Faculty use of GenAI comes with fewer clearly delineated lines of usage.

Here are just a few questions we might need to ask ourselves about faculty use of GenAI:

- The parent companies of some LLMs are facing lawsuits because the models appear to be capable of reproducing the style of living authors, implying copyrighted works were ingested without permission. Does this taint our use of LLMs for teaching or research purposes?
- Is it always okay to use AI-generated images over ones found via online image searches? Does it change anything if the GenAI was "trained" on copyrighted images without permission?
- Is it wrong to use LLMs to generate class/teaching materials if my own policy is that students can't use LLMs at all?
- If we embrace GenAI to its fullest extent and "lean in" to it not just for faculty usage, but also interwoven into student assignments, are we possibly short-changing them on an education in the fundamentals that doesn't use AI at all? And, if we do assign assignments that require AI tools, how can we ensure that use remains equitable for students who lack digital access or resources?
- How much AI assistance is "too much" when it comes to writing recommendation letters, drafting an employee's annual evaluation, or student grading?

One thing is clear: it would be unethical to use AI in any form or fashion without full transparency (or, put another way, it's only ethical to use AI when clearly

communicating where and how you've used it). Even invisible brainstorming and outlining needs to be disclosed. As mentioned in the introduction, in this book we only used LLMs to verify that the prompts we provided in the book actually returned useful results, and to draft some of the prompts and the research chapters.

We might be tempted to draw a similar conclusion about the ethics of evaluation, but the lines are blurrier here. On first glance, it might seem innocuous enough to ask an LLM to create a first draft of a recommendation letter for a graduating student, especially if you plan to heavily edit the original AI output, but if you don't change every sentence, then part of the "evaluation" will have been written by a machine that never met this student. This is especially problematic because evaluative documents have consequences. Your former student might not be accepted to medical school; or your colleague at another institution might be denied tenure. Someone you supervise at work might not get this year's raise.

The ramifications of AI-guided grading might not seem immediately obvious, but the implications are sobering. If AI tools become reliable enough to replace humans in grading, it could have grave consequences for staffing levels within academic departments.

Future Directions for GenAI

It is of course folly and the height of hubris to pretend we have any confidence in knowing for sure how AI technology will continue to develop and evolve. Few saw

the development of LLMs making such rapid in-roads in school and work life, yet this revolution is well underway, and these environments are unlikely to ever return to practices from the pre-AI days. But while we don't know where we're headed long-term, we think it might be possible to prognosticate about short-term and medium-term time horizons.

In the immediate present, we're seeing increased sophistication among the early adopters, particularly when it comes to advanced prompt engineering. The entire concept of prompt engineering was new for most of the population, but enough time has elapsed that more people have started experimenting, and, equally importantly, sharing their discoveries with their colleagues.

In the short term, we'll see adoption in college gradually rise as late adopters, both faculty and students, come around to recognizing the seismic shift as permanent. Peers across all groups will be key in helping bring late adopters up to speed, but we may face a few years still of heterogenous audiences.

Our best guess for the medium-term future is that we'll see a commingling of tools, and a concomitant shift in ways of thinking about how to use AI. Partly this will be driven by the tools themselves becoming multi-modal: rather than an LLM receiving only text prompts and dispensing only text outputs, we'll increasingly see tools that accept images and provide text analysis, or text-to-generated images, and perhaps the ultimate killer app, text to video. There are important questions to answer about deepfake videos that

look so realistic as to overcome initial skepticism about their reality, but were in fact AI-generated.

The explosion of possible modalities will cause a shift in how we think about AI, and how we interact with such technologies. Rather than labor over a perfect prompt to obtain a striking AI-generated image of a colorful underwater cave, for instance, we can already turn to a different mono-modal LLM to explain our desired image outcome, and ask the LLM for a text-based prompt to put into the image generator. In many cases, the LLM can write a better prompt than we can!

This is just one example of how our thinking will shift. We will continue to find ways to inject AI into our daily processes and tasks. In fact, we view it as likely that this transition to a new AI-economy is not only longitudinal, it is likely eternal. We will, now and forevermore, be in a state of learning new AI tools and re-evaluating how they might provide added value to our current processes. The one constant is likely to be the need for humans adding value, both on the prompt engineering side (asking the right questions) and on the side of evaluating AI output (putting it to use, correcting it, etc.). As we march inexorably toward the future, we will continue to see that AI will not displace humans; nor will humans overcome the need for AI. The future of all work is humans + AI, and the field of education is no exception.

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Eric Main joined UCF's Faculty Center for Teaching and Learning in 2001 and is its Associate Director. He teaches the center's *Preparing Tomorrow's Faculty* program, organizes its annual faculty development institute, and edits its *Faculty Focus* essay collections.

Liz Giltner earned her Ph.D. in TESOL from UCF where she taught French for 17 years. She is now an Instructional Specialist at UCF's Faculty Center for Teaching and Learning and has redesigned aspects of her French courses using AI. She is interested in helping faculty use the technology to facilitate their teaching.

How can AI tools lessen my workload?
Strengthen my teaching?
Assist in my research?
Simplify my administrative tasks?

50+ AI Hacks for Educators

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AI tools have powered our phones, our cars, our news, and countless other aspects of our lives for years now. Still, the emergence of Large Language Models (LLMs) feels, to many of us in education, as the most dramatic disruption we've experienced yet. And yet, with these challenges comes great opportunities to strengthen our teaching and simplify the many other tasks we're responsible for in our professional lives as faculty members.

In this book, four educators with decades of teaching experience provide concrete, applicable ideas for utilizing LLMs and other AI tools to add creativity to our courses and lessen the toll of administrative tasks. Whether you teach literature or physics or anything in between, this collection of tips and assignments will provide you with practical ideas you can use today.

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