Online Professors' Experience with Students Misusing Artificial Intelligence (AI) in Higher Education: An Exploratory Case Study

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Abstract

The problem addressed in this study was online professors at urban, 4-year degree-granting institutions are experiencing students using Large Language Model Artificial Intelligence tools to misuse or engage in unethical behavior. The purpose of this qualitative exploratory case study was to investigate online professors' experiences with students' use of Large Language Model Artificial Intelligence tools and their perceptions of how course assignments can be created and evaluated to prevent misuse. The research questions addressed were: (1) What are online professors' experiences with student use of Large Language Model Artificial Intelligence tools in higher education institutions' online courses, and their perspectives on the ethical implications of designing assignments without proper guidelines for Artificial Intelligence integration? (2) How do online professors describe their ability to create and evaluate course assignments to deter online students from misusing Large Language Model Artificial Intelligence tools? The research draws on deterrence theory as the guiding framework. Semi-structured interviews and a focus group were used to collect data. A thematic analysis approach was used. Findings revealed that integrating AI tools with clear ethical guidelines for assignment design, enhancing digital literacy, and considering the needs of neurodivergent learners are crucial for effective integration of intelligence. Implementing these practices can shift Artificial Intelligence from being perceived as a threat to academic integrity to being a tool that deepens knowledge construction, promotes equitable access, and reinforces the credibility and relevance of learning in higher education institutions transformed by the integration of ethical Artificial Intelligence. The ethical and inclusive artificial intelligence model emerged from the study as a framework for guiding the ethical integration of artificial intelligence. The study contributes to the growing body of knowledge on the ethical integration of Artificial Intelligence in higher education institutions.

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This dissertation is more than a scholarly project. It reflects my passion to use AI to improve people's lives. My heart is for people who, like me, began in environments where opportunity felt out of reach, either due to low socioeconomic status or diverse learning challenges.

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Chapter 1: Introduction

According to the National Center for Education Statistics (2022), since the COVID-19 outbreak in 2020, there has been a worldwide increase of approximately 186% in the number of students enrolled in online higher education courses. Additionally, with the resultant increase to approximately 7 million students from 2.4 million, there has been a corresponding rise in the development of artificial intelligence (AI) applications and software used in online learning courses (Cope et al., 2021). The focus has changed to using AI in education (AIED). The concepts and resultant technologies have developed since their early adoption in the 2000s and continue to evolve.

The evolving focus on the whole AI environment of online learning from 2000 to 2009 led to a realignment of focus on the learning outcomes of online courses from 2010 to 2019 (Guan et al., 2020). Significant research has provided evidence of the focus of AIED, which has pivoted once again following the 2020 COVID-19 global pandemic (Bao, 2020; Guan et al., 2020; Nemorin et al., 2022). Recent research has found that COVID-19 was not the direct cause, but it may have accelerated the need for online learning to replace traditional face-to-face classroom instruction (Tsekleves et al., 2021). Kowalczuk-Waledziak and Waledziak (2021) highlighted technological innovations that support advancements in video conferencing and learning management systems during the pandemic, making online learning applications more accessible and user-friendly than before the global shutdown.

AIED dates to the 1960s when the University of Illinois introduced the Programmed Logic for Automated Teaching Operations (PLATO). In the 1970s and 1980s, many institutions adopted computer-based education systems, offering interactive and personalized instruction to learners across the United States (Cope & Kalantzis, 2023). Progress toward more sophisticated AIED systems remained relatively slow until the emergence of the internet and online learning

platforms. For example, in the early 2000s, online tutoring services and learning management systems began to incorporate AI-based features to provide personalized feedback and support to students. AIED advanced rapidly, and new educational software emerged (Tlili et al., 2023). The philanthropic work of organizations like the Bill and Melinda Gates Foundation partly funded the emergence of new AI-based educational systems. This helped to develop the Assessment and Learning in Knowledge Spaces (ALEKS) adaptive learning system, which uses AI to provide personalized math instruction through the Adaptive Learning Market Acceleration Program (ALMAP; Cavanagh et al., 2020). Despite the many benefits of online learning, there is evidence that online learners can plagiarize their work using AI tools (King, 2023).

AI continues to be utilized in online education to deliver personalized instruction, automate grading and feedback, and assist teachers in their work. However, there are also concerns about the ethical implications of using AIED, particularly regarding data privacy and potential biases in AI algorithms (Dieterle et al., 2022). Cheating in online courses is a concern that has garnered the attention of professors and higher education institutions for decades, causing many universities to incorporate digital forensic techniques (Johnson & Davies, 2020), such as text-matching software (TMS), to uncover patterns of cheating in students' writing assignments (Eaton et al., 2021). While studies have highlighted the problem of plagiarism in e-learning, and some higher education institutions have attempted to provide solutions, there has been limited research into the use of large language model (LLM) AI tools for cheating. This research examined online professors' experiences and perceptions of creating and evaluating course assignments to discourage online students from using LLM AI tools to cheat at urban 4-year degree-granting institutions in the USA.

Statement of the Problem

The problem addressed in this study was online professors at urban, 4-year degree-granting institutions experience students using LLM AI tools to misuse or engage in unethical behavior, a situation exacerbated by the 186% increase in distance education enrollment since the onset of the COVID-19 pandemic (Mhlanga, 2023; Parnell, 2022). As professors interact with students, they need effective strategies to persuade students who cheat or misuse AI that the risk and potential repercussions are too high. Electronic detection software can deter cheating to an extent, but it is not a standalone solution (Casey et al., 2019; Johnson & Davies, 2018).

Existing literature has emphasized the need for empirical research on academic dishonesty (Irizarry, 2021; Kleinke, 2020). Ignoring this issue could lead to an increase in cheating, a decline in academic integrity, and a reduction in the quality of online education, thereby affecting retention rates and the credibility of online degrees (Chiang et al., 2022; Happel & Jennings, 2007). These issues, which could lead to long-term consequences for higher educational institutions and the job market, require careful consideration. Addressing this problem by understanding professors' experiences and perceptions can help institutions develop more effective strategies to prevent cheating, promote academic integrity, and maintain the quality and credibility of online education.

I explored online professors' experiences with students' use of LLM AI tools and their perceptions of how course assignments can be created and evaluated to deter cheating at urban 4-year degree-granting institutions in the United States. Striking the right balance between employing technology to deter cheating and respecting students' rights to privacy is essential to ensure fairness in online education. Given the higher attrition rates in online classes (Walker-Roberts, 2020), the study explored the potential impact of LLM AI tools used for cheating or

misuse on retention and completion rates. In so doing, the study aims to help institutions develop effective strategies to prevent cheating, promote academic integrity, and ensure the credibility of online education.

Purpose of the Study

The purpose of this qualitative exploratory case study was to investigate online professors' experiences with students' use of LLM AI tools and their perceptions of how course assignments can be created and evaluated to deter cheating at urban, 4-year degree-granting institutions in the United States. This qualitative exploratory case study has been a logical and explicit response to the problem statement, highlighting online students' increased use of LLM AI tools to cheat in higher education institutions. The overarching goal of this study was to understand online professors' experiences with students' use of LLM AI tools and perceptions of how course assignments can be created and evaluated to deter cheating.

Data for the study were collected through semi-structured interviews with a sample of online professors who teach at urban 4-year degree-granting institutions in the United States. The sample size was determined through theoretical saturation, whereby data collection was continued until no new information emerged from the interviews. The study was conducted in several steps. First, the target population consisted of online professors teaching at urban, 4-year degree-granting institutions in the United States. A purposive sample of participants was selected. The materials/instrumentation for this study included semi-structured interview questions and a focus group designed to gather rich, descriptive data on the experiences and perceptions of online professors. The transcripts were analyzed using thematic analysis to identify key themes and patterns in the data. The study categories included the types of assignments that professors create, the strategies they use to prevent cheating, and the

experiences and perceptions of online professors. The study provides insights into the strategies and tactics professors use to deter online cheating, contributing to the development of effective strategies to prevent academic misconduct in online learning environments.

Introduction to Theoretical Framework

The deterrence theory served as the theoretical framework that guided this study. Deterrence theory was introduced by Cesare Bonesana di Beccaria in 1764 in *On Crimes and Punishments*, in which they posited that perfecting self-restraint or education in virtue deters crime. Despite the foundation laid for the theory, the work has been criticized by some who feel that Becarria's work did not provide a comprehensive theory of behavior. Critics have pointed out that the early work merely drew attention to the idea that crime is driven by self-interest inherent in everyone (Paternoster, 2010). Another Enlightenment philosopher who has been credited with significantly adding to deterrence theory is Jeremy Bentham. In *An Introduction to the Principles of Morals and Legislation*, Bentham introduced modern utilitarianism, a concept based on the balance of pleasure attainment and pain avoidance, which has its roots in consequentialism (Mohn, 2023; Paternoster, 2010). They proposed that humans are motivated by the desire to maximize pleasure and minimize pain, a principle referred to as *hedonistic calculus* (Mohn, 2023). The hypothesis has been credited as the basis for rational choice theory (Akers, 1990). Cullen (2006) contends that the deterrence theory comprises two key concepts: specific deterrence and general deterrence. Specific deterrence refers to the impact of punishment on an individual's future behavior. They further propose that the theory suggests that punishment, in the form of legal sanctions, will discourage an individual from committing a crime in the future. General deterrence, on the other hand, refers to the impact of punishment on the behavior of

others in society. The theory implies that punishment, in the form of legal sanctions, will discourage others from committing a crime.

The deterrence theory proposes that the perception of risk is more important than the actual risk of punishment, and the idea that the severity and certainty of punishment are more important than the swiftness of punishment (Cullen et al., 2006). In online education, the perception of the risk of being caught and punished for unethical AI usage is more important than the actual risk. Additionally, the severity and certainty of punishment, such as using electronic detection software or digital forensic techniques, are more critical than the swiftness of punishment in deterring students from violating academic integrity in online courses (Kumar et al., 2019). The deterrence theory served as a valuable theoretical framework for this study, as it provided a theoretical foundation for understanding the rational decision-making process involved in deterring individuals from engaging in unethical behavior or violating academic integrity policies in online courses utilizing LLM. The theory's concepts and propositions are relevant to the context of online education and guided research decisions.

Introduction to Research Methodology and Design (Nature of the Study)

Qualitative research is a methodology that can be used to explore how people view and experience new phenomena. Features used when implementing a qualitative method that make it ideal for capturing the thoughts, feelings, or interpretations of participants' perspectives about a topic are the ability to develop core concepts across various disciplines, provide qualitative methods techniques for implementation, and provide a high-level overview of the case being researched to explore all aspects of the case. A qualitative method allowed me to discover a holistic understanding of phenomena in their natural setting. As a research methodology in the social sciences, it offers strategies and techniques to maximize the discovery of a topic through

interviews or focus groups, allowing the researcher to gather information. The exploratory design examined emergent generalizations, including descriptive facts, tribal knowledge, social processes, and belief systems. The exploratory research design is used when there is limited knowledge about a specific group, process, activity, or situation. Yet, there is a strong belief that the topic will have future implications that must be discovered (Given, 2008).

Conversely, the quantitative methodology is a social science framework that measures data gathered in research to explore patterns and show relationships. Similar to data gathering for qualitative methodology, researchers can use various techniques to collect data in quantitative methodology. These techniques include surveys, structured longitudinal studies, and, in some cases, experiments. Some researchers believe that quantitative research is less subjective than qualitative research. This research could also have been conducted using participatory action research (PAR) as a thematic approach to qualitative research that would have allowed data to be gathered through interviews (Coghlan & Brydon-Miller, 2014). Nonetheless, an exploratory case study was the best design for this research.

The best design for this research was an exploratory case study, as large language models are an emerging technology that presents new opportunities for cheating. Concatenation or longitudinal research is exploratory research that maximizes the discovery of generalizations through systematic data collection, as informal experimentation. Sometimes, it can be described as the accidental discovery or spontaneous invention of a phenomenon (Given, 2008).

A case study is a qualitative design used to collect data by interacting with people to gather information within the study's boundaries, thereby gaining knowledge about a contemporary phenomenon in its real-life context (Range, 2023). Recent advancements in AI-based LLMs have been identified as potential tools that can be used for cheating (Cotton et al.,

2023). An exploratory case study was ideal for delving into this novel application to unravel the complex relationship between professors, students, academic dishonesty in online courses in higher education, and large language models. A phenomenological design was considered but rejected for this research because LLM AI is a relatively new area of study and data collection, focusing on a single event. The use of AI in higher education has grown and will continue to evolve. Individuals might have been unable to give in-depth insights into the problem, thus possibly limiting rather than advancing the research.

Exploratory research is characterized by its exploratory nature, wherein it can enhance the precision of a theory by confirming propositions that are not amenable to quantitative methods of investigation (Given, 2008). Conducting research within its natural context is a crucial strength of case studies (Baxter & Jack, 2020). A real-world investigation of the phenomena fosters a greater understanding of how plagiarism using LLMs occurs, why it happens, and the factors involved. Therefore, strategies for deterring students from online courses at higher institutions were developed and widely adopted across institutions, using an exploratory case study as a data collection method for a holistic analysis (Baxter & Jack, 2020). Interviews with professors, analysis of student behaviors, and investigations of LLM data were combined to provide a multifaceted perspective on plagiarism using AI-based LLMs. The exploratory case study approach offered a robust understanding of how to deter cheating in online courses in higher education.

Research Questions

The research questions addressed in this study were:

RQ1

What are online professors' experiences with student use of LLM AI tools in HEI online courses, and their perspectives on the ethical implications of designing assignments without proper guidelines for AI integration?

RQ2

How do online professors describe their ability to create and evaluate course assignments to deter online students from misusing LLM AI tools?

Significance of the Study

The introduction of online learning has brought several challenges, one of which is maintaining academic integrity. Cheating in online courses at higher education institutions was identified as a substantial issue to address (Esposito, 2018; Irizazzy, 2021; Kleinke,2020; Nuriddin, 2019; Walker-Roberts, 2020). With the emergence of LLM technology, there has been a growing interest in how professors can leverage the development and assessment of assignments to deter such practices. As such, an exploratory case study in this context will hold substantial significance, with implications ranging from advancing knowledge to improving pedagogical practices and future research directions (Riad, 2023). Moreover, the exploratory case study aimed to identify effective strategies that leverage professors' knowledge and experience to deter academic dishonesty through student use of LLM AI tools in online higher education. The strategies elucidated could be disseminated among educational institutions and educators, providing practical solutions to this long-standing issue in education (Anders, 2023).

Definitions of Key Terms

Academic Dishonesty

Academic dishonesty is defined as committing or contributing to dishonest acts by those engaged in teaching, learning, research, and related academic activities; it applies to everyone in the academic environment (Cizek, 2003; Keith-Spiegel & Whitley, 2002).

Artificial Intelligence (AI)

Artificial intelligence is the theory and development of computer systems that perform tasks typically requiring human intelligence, such as visual perception, speech recognition, decision-making, and language translation (Deitler et al., 2022).

Chat Generative Pretrained Transformer (ChatGPT)

ChatGPT is a chatbot developed by OpenAI with a conversational artificial intelligence interface (Mhlanga, 2023).

E-Cheating

E-cheating refers to using electronic devices to cheat on exams and assignments in online learning courses, utilizing ICT tools (Bąkała et al., 2020).

Online Learning

Online learning is conducted via electronic media, typically online (Cope & Kalantzis, 2023).

Generative AI

The term *generative AI* is also closely connected with LLMs, which are, in fact, a type of generative AI specifically designed to generate text-based content (Lim et al., 2023).

Large Language Models (LLMs)

Large language models are AI algorithms that utilize deep learning techniques and massive datasets to understand, summarize, generate, and predict new content (Kasneci et al., 2023).

Plagiarism

An academic integrity violation is the intentional or unintentional use of another author's work, taken from either digitally generated materials or another person's authored work, without properly citing its use. (Casey et al., 2019; Cronan et al., 2018; Goodwin et al., 2020; Irizarry, 2021; Khadilkar, 2018).

Self-plagiarism

It is a form of plagiarism that is an act of academic misconduct in which parts of previously written materials, research, results, conclusion, discussion, or other forms of inappropriate text recycling of an individual's previous work with a clear intention to deceive (Horbach & Halffman, 2019; Irizarry, 2021; Joob & Wiwanitkit, 2019; Mei-Lien et al., 2020; Takeda, 2023).

Summary

The increase in online course enrollment, partly due to the shelter-in-place order issued by the World Health Organization (WHO) during the 2020 COVID-19 global pandemic, prompted most brick-and-mortar higher education institutions to transition to online learning options rapidly (Agarwal et al., 2021). As a result, attention was drawn to the increase in the development of AI-based applications and tools used in online courses (Cope et al., 2021). The development of LLM AI tools that can be used to cheat is of particular concern. Academic dishonesty is not a new problem in education, but one that has been at the forefront of discussion

among educational institutions for many years. Consequently, many universities have implemented digital forensic techniques to combat the problem of students engaging in unethical behavior with AI (Davies & Johnson, 2023). Although many researchers have investigated plagiarism in online courses, a gap remains in the research investigating AI tools used to cheat in online learning courses at higher education institutions.

The strategies identified in this exploratory case study for deterring students from cheating using LLMs could contribute new knowledge to the field of education. The elucidated strategies could not only be disseminated among educational institutions and educators, providing practical solutions to this issue, but they could also significantly contribute to the development of policies and guidelines. By highlighting best practices for creating assignments and assessments that deter students from cheating using AI-based tools such as LLMs, the study could guide educators and instructional designers in enhancing the learning experience (Kebritchi et al., 2017). Lastly, this study paves the way for future research in this domain. It represents an exciting opportunity to address a pressing challenge in our increasingly digital education landscape.

Chapter 2: Literature Review

The purpose of this qualitative exploratory case study was to investigate online professors' experiences with students' use of LLM AI tools and their perceptions of how course assignments can be created and evaluated to deter cheating at urban, 4-year degree-granting institutions in the United States. The problem addressed in this study was online professors at urban, 4-year degree-granting institutions are experiencing students using LLM AI tools to misuse or engage in unethical behavior, a situation exacerbated by the 186% increase in distance education enrollment since the onset of the COVID-19 pandemic (Mhlanga, 2023; Parnell, 2022). As professors interact with students, they need effective strategies to persuade students who cheat or misuse AI that the risk and potential repercussions are too high. Electronic detection software can deter cheating to an extent, but it is not a standalone solution (Casey et al., 2019; Johnson & Davies, 2018). This literature review aimed to examine AI in education (AIED), focusing on creating and evaluating course assignments designed to deter students from cheating using LLM AI tools in an unethical manner. The literature review examined how professors promote academic integrity when addressing the challenges of integrating emerging technology, specifically large language models, into educational applications. The literature review examined the current state of AI, highlighting recent advances in machine learning that have led to the implementation of learning systems and tools that enhance the teaching and acquisition of knowledge by students. It addressed the ethical issue that professors are experiencing with online students using LLM AI tools to cheat in 4-year degree-granting higher educational institutions, as well as the underlying concerns about its negative impact on students.

Information from AI use across various educations institutions was gathered to provide further insights into students using ChatGPT and similar tool applications to cheat in online

courses. The literature review explored the historical roots of AI, dating back to 1956, when the phrase was first introduced at a conference at Dartmouth. It contextualized the growing role of AIEDs from then to now. Then, it delved into AI tools and applications of the technology to enhance learning, support teaching, and provide administrative support through automation. Following COVID-19 and the rapid growth of online learning worldwide, there is an increased interest in exploring the benefits and challenges of AI tool use in education. Cheating or AI misuse in online courses at higher education institutions has been identified as a substantial issue to address (Esposito, 2018; Irizarry, 2021; Kleinke, 2020; Nuriddin, 2019; Walker-Roberts, 2020).

I conducted a comprehensive review to explore the current status of academic integrity policies designed to prevent plagiarism in higher education institutions, as well as the need to establish new guidelines that promote ethical governance to address issues related to fairness and transparency across the university system and in government policy, in response to evolving threats. There has been a rapid emergence in ChatGPT and similar applications, introducing new technology. Plagiarism is not a new phenomenon that lacks research. Additionally, self-plagiarism constitutes a novel form of academic misconduct that remains unclear for many students and professors within the academic community (Joob & Wiwanitkit, 2019). A recent investigation into the peer-reviewed articles written by Dutch scientist and professor Peter Nijkamp drew the attention of their audit to allegations that Professor Nijkamp and doctoral student Karima Kourtit had recycled previously written articles. The investigation sparked a debate among academics about what constitutes self-plagiarism or improper recycling versus fair re-use of text. Many remain undecided on both sides of the debate. The result of the integrity committee's investigation deemed the professor and the student guilty of plagiarism on the

grounds of recycling previously written work. Conversely, Professor Nijkamp and Kourtit were acquitted of additional allegations of self-plagiarism because the committee did not believe they had clear intentions to cheat (Horbach & Halffman, 2019). Nonetheless, a gap remains in the research investigating how professors create assignments and assessments to deter students from using LLM AI tools to cheat in online learning courses at higher education institutions in urban areas of the USA.

Since some believe that using ChatGPT and other LLM AI poses an extraordinary threat to higher education, this study focused on professors' experiences with students cheating in higher education institutions and the ways they design assignments to deter misconduct. For example, there is concern that students' critical thinking skills will be diminished as a result of using the software applications (Mhlanga, 2023; Rahman & Watanobe, 2023). The study addressed this and other concerns related to knowledge attainment when utilizing LLM in higher education. This chapter provides a brief discussion of the importance of deterrence theory as the framework for this study and its potential future impact. The study concluded with recommendations for establishing ethical policies that deter cheating, enhance student engagement, and promote the expansion of AI applications in higher education to support professors and students in facilitating knowledge attainment.

The use of LLM AI tools in higher education is an emerging area of research. The novelty of LLM AI has given rise to new opportunities and challenges in higher education, one of which is the need to guide its ethical use in education (Foltynek et al., 2023). The use of AI has come under scrutiny as an educational tool because it is believed to give some students an unfair advantage, potentially allowing them to cheat or plagiarize their assignments. As a result of concerns about the unethical use of LLM AI, higher education institutions are becoming

hypervigilant about implementing policies and software detection systems to deter students from cheating using AI (King, 2023).

Another concern was how institutions would prevent the misuse of data collected through AI-based educational tools. There are also academic integrity threats, such as the fabrication of information retrieved from LLM AI and the misuse of the information gathered, that further exacerbate the problem of cheating in higher education (Foltynek et al., 2023; Geryk, 2023; Ghosal, 2023). As LLM AI develops, colleges and universities are investigating and implementing processes to manage the ethical use of the technology. Many institutions have implemented digital forensic techniques to combat students' misuse and/or cheating online (Davies & Johnson, 2023). However, detecting AI-generated text is a new phenomenon that requires other methods, such as an AI-based detection system, to recognize patterns in computer-generated text (Cingillioglu, 2023).

Literature Search

The literature was organized in a manner that pertained to the research theme. Seuring and Gold (2012) proposed the paper review process to synthesize existing research and then pinpoint and select literature based on the synthesis. These steps within this method include (1) source identification, (2) source selection and extraction, and (3) source evaluation and category creation (Agrawal et al., 2015; Reim et al., 2015). There were several major research topics contained in the categories of literature: (a) AIED's historical context and growing role in education, highlighting its impact on teaching, learning, and educational accessibility; (b) the emergence of modern LLM AI applications and their capabilities in educational settings with the integration of sophisticated AI technologies like ChatGPT; (c) ethical concerns and cheating in higher education; (d) current academic integrity policies; (e) gaps in the research; (f) threats and

concerns of ChatGPT uses in course assignments; (g) the relationship between deterrence theory and AIED; and (h) recommendations and conclusions. This literature review was constructed to provide an analysis and assessment of concepts from other authors, connecting this study to the findings of others and the broader body of knowledge (Wakefield, 2015). The sources for this literature review were selected based on the study questions formulated to investigate and clarify the effects of using LLM AI on course assignments and assessments in urban, four-year degree-granting higher educational institutions in the USA. The clarity of the research question definition was carefully constructed to assist in formulating the criteria used in selecting articles relevant to the study's phenomenon (Wakefield, 2015).

The sources for this study were obtained from education databases via the National University Library search engine. To identify the relevant literature, Academic Source Complete, ProQuest Central, EBSCOHost, Ulrichsweb, Google Scholar, Sage Journals, ERIC, Wiley Online Library, Internet Archive, Cornell University, Science Direct, and JSTOR databases were searched for relevant keywords, e.g., *artificial intelligence, large language models,* and *deterrence theory*. I employed the same method used by Volland et al. (2017), which is a forward and backward search within these publications by applying the following additional, relevant keywords: *Artificial Intelligence in Education, education technology, EdTech, machine learning, deep learning, personalized learning, adaptive learning, large language models, generative pre-trained transformer, natural language processing, writing, ChatGPT, GPT-3, GPT-4, OpenAI, AI-generated text detection, generative artificial intelligence, higher education, university academic integrity, online learning pedagogy, intelligent tutoring systems, smart applications,* and *AI ethics, GPT, AIED, academic cheating*, *deterrence, and educational deterrence* which concluded the search process.

The sources essentially included scholarly journals that examined the following themes: AIED's growing role in education, highlighting its impact on teaching, learning, and educational accessibility; the emergence of LLMs and their capabilities in educational settings and the advent of sophisticated AI tools like ChatGPT; AI tools and applications in education; introduction of AI in curriculum and instruction; AI and educational accessibility for students with disabilities; specific use cases and applications of LLM AI; and the relationship between deterrence theory and AIED. The literature research was limited to English articles published in scholarly/peer-reviewed journals. Some conference articles and working papers were included.

The central focus was on publications from 2018 to 2024. The most frequently cited research was utilized for the seminal works published before those dates. Publications related to deterrence theory date back to 1879 and the introduction of AI in 1956 (Shadbolt, 2022).

Theoretical Framework

The guiding theoretical framework of this study was deterrence theory (DT). The theory dates to the 18th century, when Cesare Bonesana and Marquis de Beccaria decided to write a book about their thoughts on Italy's criminal justice system, Trattato dei *Delitti e delle Pene*. The work depicted their experience as experts in legal institutions at the time of graduation from law school at the University of Pavia. After its publication in 1763, the book was translated into several languages until it was finally translated into English in 1766 as *An Essay on Crime and Punishment* (Bridgwater, 1907). The basic principle of the theory is that Beccaria sought to balance the proportion of punishment to crime and the allocation of judicial and legislative power to reform civil and criminal procedures. This balance, which enables institutions to distribute human rights and individual protection equitably, made DT an ideal choice for this study, as Beccaria was concerned about the public utility of private incentives and the public

interest in institutions (Ramello & Marciano, 2018). A recent study at the University of Nebraska at Omaha highlighted the importance of teaching students the importance of deterrence. As a result, a course on deterrence was added to the academic curriculum for students (Obradovic & Black, 2020). The current threats that universities face, which make deterrence a relevant theory, include the integrity of online learning as a valid method for knowledge attainment in higher education and broader cybersecurity threats resulting from the improper use of technology.

In this qualitative, exploratory case study, I investigated online professors' experiences and perceptions of using DT to address current technology threats in academic settings. The success of the framework in other settings to refine and stabilize nuclear, cyber, and space threats by stabilizing a class of threats that were perceived as particularly destabilizing, such as certain classifications of weapons during the Cold War, supported its use for modern technology threats that have resulted from the emergence of LLM AI and similar technology. Just as DT is used to terminate treaties that increase the risk of sudden nuclear exchange by reducing the threat of nuclear escalation, making it less likely to occur, it has the potential to challenge contemporary academic integrity threats.

Contemporary academic integrity threats include those that have emerged through technological advancements and a lack of institutional policies for addressing the new academic integrity concerns presented by LLM AI. Establishing deterrence policies to reduce the occurrence of cheating using LLM AI in online course assignments is one part of a multidimensional plagiarism threat in contemporary higher education institutions that combine traditional brick-and-mortar classrooms with e-learning. Failing to address this type of academic dishonesty may threaten on-campus learning, as students utilize online tools for assignments, thereby compromising the integrity of online learning by undermining its validity (Verhoef &

Coetser, 2021). In the context of this study, the theory guided the research questions from the perspective of professors and their practices aimed at deterring cheating or unethical AI usage.

Beccaria (1778) appealed to the value of human welfare over the crime that an individual committed in cases that did not involve gross negligence, like murder or other violent crimes. They appealed to the better nature of legislators to make the punishment commensurate to the crime. It was their suggested system of adjudication that laid the foundation for the deterrence theory. By providing lesser forms of punishment for less egregious crimes, an offender could be deterred from committing violent crimes if they believed they had a higher probability of that illicit action resulting in an extreme reprimand like the death penalty.

Commentators have described the theory as a utilitarian approach for the founders of law and the judicial system to incentivize legislatures to demonstrate public utility when determining a judgment, using the appropriate level of discipline required for a crime committed for the betterment of the public good (Ramello et al., 2018). By leveraging deterrence theory, this qualitative exploratory case study examined the crucial role played by the system of incentives and consequences provided by deterrence theory and the perceived certainty, severity, and swiftness of punishment accompanying it. The findings of this study provided valuable insights into the effectiveness of deterrence as a means of preventing plagiarism. I explored how professors create assignments and evaluate the work submitted by students online to deter them from using LLM AI unethically.

The primary method for addressing issues of academic dishonesty is failure or expulsion if they a student has been found to have persistently plagiarized (Riad, 2023). This could lead to unwanted student attrition. Developing a process to deter students from using LLM AI to cheat would benefit the institution by maintaining retention rates and help students by allowing them to

remain in good standing with the institution as they work toward completing their degree (Van Wyk, 2024). It could also lead to discovering new ways to utilize LLM AI, resulting in knowledge acquisition rather than the attrition of students' cognitive thinking skills.

Deterrence theory provided a theoretically relevant framework for understanding the phenomenon of students cheating using LLM AI applications in higher education. It facilitated the creation of institutional policies and detection methods aligned with the theory, instilling a sense of certainty in students that they would be caught if they misused or cheated; therefore, it raised the question of why a student would risk punishment. Other theory tenets that supported a better understanding of the phenomenon were the suggested severity of punishment associated with academic dishonesty and the immediacy with which the punishment would follow a fraudulent action (Siponen, 2022). By establishing policies for performing academic fraud using LLM AI, the door is opened for students and faculty to discuss the software application and explain how it should or should not be used for online assignments. The resultant discussions can potentially increase awareness of LLMs and academic integrity, thereby enhancing the higher education community's understanding of their use.

The deterrence theory originated after Becarria laid the foundation by establishing its characteristics in the 18th century. The theory was further developed by Jeremy Bentham, another Enlightenment philosopher credited with being the father of modern utilitarianism (Dardenne, 2010). He expounded on the dualism of deterrence theory, which acts as a pendulum of pleasure and pain avoidance, serving as a restorative force of justice rooted in consequentialism (Mohn, 2023; Paternoster, 2010). The pivot between reward and punishment, along with the perception of the resultant impact on one's behavior and society, converges to make deterrence an effective

tool for crime prevention. Scholars debate the balance of severity, certainty, and the speed of punishment (Pratt et al., 2006).

Historically, deterrence theory has been used in criminology and legal studies. However, academic integrity in higher education institutions also requires a balance between the pleasure or reward of cheating versus the perceived pain or risks associated with such deviant acts, in order to prevent misconduct effectively (Willison et al., 2018). Although it has been primarily used in criminology and legal studies, it has also been applied to academic integrity in higher education, as it provides a comprehensive framework for understanding and preventing academic dishonesty, emphasizing the consequences and psychological impact of punishment.

Rational Choice Theory Rejection

Beccaria's work in the 18th century proposed that presenting the deterrence theory, which inevitably laid the foundation for rational choice theory, necessitated the establishment of a comprehensive and organized set of ethical guidelines for governance (Bentham, 2000). They promoted the utilitarian principle, suggesting that it is better to prevent crimes than to severely punish gross criminal infractions (Paternoster, 2010). It is debatable whether the same principle holds for academic settings. Implementing policies and guidelines aligned with the deterrence theory may reduce the incidence of academic dishonesty using LLM AI in higher education. By establishing a set of rules designed to guide the conduct, decision-making, and actions of online students when using LLM AI, they can be used as a framework to ensure that actions are consistent, ethical, and aligned with the values of four-year degree-granting higher education institutions.

While rational choice theory offered valuable insights into the decision-making processes behind academic dishonesty, it had limitations in addressing the full spectrum of factors that

deter such behavior (DiPietro, 2010). Conversely, deterrence theory, with its emphasis on the consequences of misconduct, the psychological impact of punishment, and the role of collective norms and clear communication, provided a more comprehensive framework for preventing academic dishonesty in the context of emerging technologies like LLMs (Trang & Brendel, 2019). Therefore, rational choice theory was rejected as the framework for this study.

AI in Education

The emergence of AIED has brought about transformative changes in teaching and learning. AI technologies in educational contexts, ranging from adaptive learning systems to intelligent tutoring systems, converge to potentially enhance the educational experience for students while providing support to educators. AI technologies, such as ChatGPT, present both significant opportunities and challenges. Research points to ChatGPT's advanced capabilities, distinguishing it as a tool that has the potential to transform education through innovative teaching approaches that can personalize the learning experience for students, presenting both opportunities and challenges for higher education (Kayali et al., 2023; Lambert & Stevens, 2023; Phutela et al., 2023). Nonetheless, the use of LLM AI tools has been debated in higher education. Some see incorporating ChatGPT into higher education as an enhanced learning tool and an opportunity to expand education through innovative teaching approaches, such as AI-powered applications that can tailor learning experiences to satisfy individual student needs for personalized learning and increased engagement. These innovations have significantly impacted teaching practices, allowing students to have more tailored and interactive learning experiences that cater to their individual needs.

Conversely, concerns and challenges related to the accuracy of information, academic integrity, the reinforcement of biases, and risks related to data privacy remain at the forefront of

the debate. Since its inception, AI has experienced remarkable growth and continued to integrate into various aspects of education. Shadbolt (2022) emphasized that transparency and accountability in AI systems are crucial when addressing ethical concerns related to bias, misuse, and privacy in AI. This was upheld by Lambert and Stevens's (2023) findings, which emphasized advances in the computing power of LLM AI, data availability, and the prospects of machine learning that are driving AI's evolution, all of which underscored the need for ethical guidelines and regulation to mitigate risks. Recent studies emphasize the benefits of integrating ChatGPT into assignments to enhance personalized learning outcomes. Bundit et al. (2023) conducted a study examining the impact of AI on customized learning and adaptive assessments in higher education, resulting in faculty members applauding AI's potential to enhance and improve learning outcomes, thereby enhancing student engagement.

Furthermore, Seaba (2023) evaluated the current state of AIED and how brain-based learning techniques potentially improve student engagement. The results underscore the potential to enhance the personalized learning experience of students by catering to their unique needs through adaptive learning and personalized features in an AI-based MOOC environment. As AI continues to shape the educational landscape, addressing the challenges of ethical implications and regulatory issues related to LLM use is critical. Considering the ethical implications and privacy concerns associated with using ChatGPT and other similar tools, it will help ensure that the benefits of AIED are realized, as students are safeguarded from the penalties of participating in academic dishonesty.

AI in Education (AIED) Cycles

The future of AIED is complex and promising. Advancements in technology, data utilization, and AI methods will continue to drive progress. Conversely, ethics, competency,

knowledge, and skill assessments, as well as security challenges related to LLM AI tools in higher education, create new prospects and risks for ChatGPT (Raitskaya & Lambovska, 2024).

This divergence has caused many researchers to come together and articulate these new prospects and dangers along with the need to carefully consider ChatGPT's limitations and ethical implications during implementation in higher education to optimize their benefits and mitigate their risks (Charles, 2023; Das & J. V., 2024; Kumar et al., 2024; Shadbolt, 2022). The history of AI has been cyclical, marked by alternating periods of enthusiasm about the potential impact of intelligent machines on education and phases of disillusionment due to slow progress and skepticism (Shadbolt, 2022). AIED's evolution has followed a repeating pattern of advancements fueled by ongoing demand and emerging technologies. AI builds on existing theories with each cycle, leading to increasingly complex and advanced applications.

First AIED Cycle

The first cycle began in the 1950s. A British engineer, Alan Turing, established a process for determining if a machine exhibits human-like intelligence in their paper, *Computing, Machinery, and Intelligence* (Turing, 1950). Turing proposed a game that allowed a human evaluator to distinguish between computer-generated and human-written text responses. If the evaluator could not determine the origin, making the computer's response indistinguishable from a human's, it passed the Turing test (Gonzalez et al., 2017). Soon after, Professor John McCarthy introduced Turing's imitation game, the term AI, at the Dartmouth Conference of 1956 (Jaakkola et al., 2019). The critical development of the first cycle was the Lisp programming language. Following the principles of Moore's Law, AI has experienced exponential growth since the early 1950s. Notable achievements in machine learning, including the establishment of intelligent infrastructure, the development of intelligent systems, and the foundational work by data

scientists in transfer learning, have created new opportunities for supporting education with AI tools. Alternatively, the limitations of the first cycle were that the algorithms were only accessible to programmers. Nonetheless, the journey toward advanced technology, such as LLM, has been promising and complex (Ghnemat et al., 2022). The work by Turing and McCarthy laid the groundwork for further AI research and the development of AI systems designed to mimic human cognitive abilities.

Second AIED Cycle

The second cycle in advancing AI was more structured by a rule-based discovery system. The critical development of this cycle was Expert Systems (ES), believed to be an essential advancement in AI, specifically developed to support medicine. Stanford University developed some pioneering ES beginning in the 1960s and continuing into the 1980s. A landmark in the history of AI is the development of Dendral, an ES designed to analyze mass spectrometry data to identify the structure of chemical compounds. Additionally, Mycin was another early ES developed in the 1970s at Stanford University to assist physicians with bacterial infection diagnosis and antibiotic recommendations for treatment. Stanford developers used a rule-based approach to mimic human decision-making by asking questions to confirm or rule out possible diagnoses based on encoded if-then rules for both ES (Jaakkola et al., 2019). This demonstration of an AI-based system's ability to effectively resolve complex scientific problems laid the groundwork for future ES across fields. Moreover, advanced AI-based technology used to support learning principles fundamental to learning through knowledge representation, inference, and decision-making that mimics human experiences was an educational tool that leveraged machine learning and complex decision-making processes. The conceptual development and application of AI from the 1950s onward have culminated in today’s AI-based education tools.

Furthermore, AI integration in the sciences demonstrates how educational tools can facilitate cognitive engagement and support personalized learning initiatives, helping to bridge education gaps for lower-performing students through AI-based technology (Almasri, 2024). The influence of the rule-based logic developed in those early ES paved the way for emerging technology in education, including AI-based virtual reality (VR) simulations. Current AI-based VR technology, for example, demonstrates how integrating AI into education enhances conceptual understanding, fostering inquiry-based learning that promotes knowledge transfer through interactive virtual experimentation, unhindered by physical limitations or safety concerns (Sreekanth et al., 2022). Hu-Ha (2024) argued that AI-based VR is an effective tool for teaching science. In a recent study of laboratory simulation conducted on students ranging from 11 to 18 years old, it was discovered that using AI-based technology led to gains in integrating students in lab activities and encouraging students to explore abstract chemistry concepts, such as virtual molecule simulations, for greater student engagement while teaching fundamental chemistry principles (Hu-ha, 2024). Similarly, professors in online learning environments can provide an interactive virtual laboratory environment that promotes active and engaging experiments not limited to a lab bench with a Bunson burner or titrator. Students can explore molecules up close and interact with atoms through 3D modeling without physical limitations or safety concerns (Sreekanth, 2022). Through the guidance of AI-based educational tools, students are guided through the process of measuring the quantity, size, and arrangement of atoms.

Notably, engaging AI-based education tools supports personalized learning experiences through transformative technology that bridges education gaps and enables students in low-socioeconomic communities to access quality education worldwide. Incorporating AI-based technology is becoming a trend in education. The acceptance of technology integration into

education settings became widespread during the COVID-19 pandemic when educators worldwide scrambled to integrate tools that support digital learning. Ada, the AI teacher at the University of Bolton in England, supports students' learning by assisting with lectures and providing personalized feedback. IBM Watson and other educational platforms are incorporated into higher education institutions to assist professors in providing feedback and tracking students' progress (Wood-Harper, 2021). Advanced AI-based tools, such as these and other chatbot technologies like ChatGPT, which leverage machine learning and complex decision-making systems capable of real-time adaptation and interactive learning experiences, have evolved from these early rule-based expert systems.

Third AIED Cycle

Furthermore, the third cycle of AI development from the 1990s to 2010 was pioneered by Japan's Fifth Generation Computer Systems (FGCS) project, one of the earliest large-scale projects that attempted to develop specialized computer architectures for AI (Jaakkola et al., 2019). The decade-long project tried to create machines with advanced AI capabilities to reason and solve problems using parallel processing and logic programming. Although technology had not advanced enough in 1992 when the project ended to realize such ambitious goals, it was foundational for modern AI computing. The 1990s and early 2000s were pivotal to the advancement of AI. The heyday of development in the third wave was specialized computer architecture for AI. The 1990s ushered in advancements in the training of deep neural networks due to the introduction of more sophisticated algorithms, which are the basic architecture for modern AI techniques used in ChatGPT and other LLMs. More advanced language processing models, such as Artificial Neural Networks (ANN), and mathematical models have been developed to mimic how biological neural networks function in human brains (Biever, 2023).

The former Princeton Professor and current Vice President of Applied Research at Microsoft, Sebastien Bubeck, sparked a lot of attention in the technology sector with his paper titled Sparks of Artificial General Intelligence (AGI). Bubeck and his team observed GPT-4's ability to exhibit human-like behavior and problem-solving skills through a series of tests that he concluded resembled intelligence. Despite his groundbreaking research results, some critics of LLMs do not believe they can display machine intelligence. Conversely, Biever (2023) concluded that while ANNs and LLMs can perform tasks like human intelligence, they do not think like humans. Likewise, Alan Turing agreed with this pragmatic view and emphasized the need to focus attention on whether the tasks performed by intelligent machines, like conversations, can mimic human thinking (Turing, 1950).

A transformative shift toward innovative AI-based education tools occurred from the projects conducted in the 1990s and early 2000s. Some key innovations include problem-based learning (PBL), Intelligent Tutoring Systems (ITS), interactive gaming, and simulation-based learning, shifting educators' focus toward personalized learning and setting the stage for more advanced AI-based education tools like LLM. Bubeck’s assessment of GPT-4 is that it displays behaviors that appear identical to human intelligence; he stops short of concluding that GPT-4 thinks like humans. They argued that the behaviors that resemble intelligence represent a step toward achieving AGI. They argued that the cognitive processes of LLM and ChatGPT are not comparable to human thinking, which is creative and innovative. They are not alone in acknowledging that educators should consider these limitations and exercise caution while attempting to anthropomorphize AI systems.

Fourth AIED Cycle

Lastly, the fourth cycle spans from the 2010s to the current day, focusing on autonomous learning, namely, versatile technology that supports education and self-improvement. Key developments during the fourth cycle of AIED include self-learning systems that use neural networks and deep learning (Jaakkola et al., 2019). Some believe it to be the most promising cycle for AI, with profound possibilities for changing education and the world. Unlike the previous three cycles, which were theoretically relevant to modern AI technology, this cycle is experiencing the change of personalized learning systems with online learning platforms, robots, chatbots, wearable AI, smart hubs, and intelligent data analytics. What role does LLM potentially play in education as we experience the anticipated AI transformation? The answer to that and other questions about using LLM in higher education is a topic of debate as colleges and universities try to implement policies and best practices for professors and students to follow to deter cheating and misuse of AI-based learning tools.

There are numerous transformative ways in which AI-based tools can be utilized in education. Personalized learning is one that most people are familiar with, regardless of their academic affiliation. Customized learning is utilized in various aspects of our lives, from online learning platforms to self-learning applications like Duolingo and Grammarly. These applications, along with others like them, are commonly used. Personalized learning applications have become more sophisticated since the 2010s. AI-based learning systems, which provide real-time data, student tracking, student-centered content, and customized feedback through platforms like Knewton and DreamBox, have revolutionized online learning (Castaneda et al., 2024). Cyclical advancements in AIED have been driven by continuous demand and the emergence of

new technologies. Many anticipate a transition toward strong AI, with machines displaying human-like abilities to create advancements in education, business, and society.

Emerging Technologies in AIED

The four cycles of AIED demonstrate how technology has progressed from its conceptual beginnings to expert systems, specialized hardware, and adaptive learning platforms over the last quarter century. Moreover, the current cycle of AIED marks a significant leap in the field. Emerging technologies are transforming our understanding of AI's capabilities as they redefine the possibilities for personalized learning and accessibility to education for all (Jinsook et al., 2024). The first three cycles focused on rigid rule-based expert systems and limited problem-solving approaches. The advancements in AIED shift the focus of the current cycle to supporting diverse educational needs with LLMs that engage students in dynamic, human-like conversations, potentially reshaping teaching, learning, and research in higher education. Consequently, examining this latest shift away from traditional methods of AIED to these emerging technologies can help us understand the broader impact of LLMs on education (Qian, 2025).

LLMs like ChatGPT have significantly advanced Natural Language Processing (NLP), a core AI capability that enables computers to engage in human-like conversations (Alqahtani, 2023). Nevertheless, it has its challenges. There is growing concern about bias, data privacy, transparency, explainability, and the need for computational resources (Patil & Gudivada, 2024). Education technology critic Dr. Audrey Watters argued that AIED tools, such as LLMs, are surveillance technologies with ethical implications for data collection and student privacy, and they enable tech companies to commercialize education (Nelson & Vee, 2024). Furthermore,

Watters cautioned that the use of AI-based technology in education may limit students' ability to think critically and their creativity.

According to Lo (2023), Dr. Sebastian Thrun, AI pioneer and founder of Udacity, supported integrating AI-based tools in education. Thrun emphasized AI's ability to provide personalized learning experiences while increasing access to quality education globally. Notably, they argued that it can create individualized learning experiences for students that are scalable and revolutionary for education. Thrun believed that AI, like ChatGPT, can support teachers and augment personalized learning. Similarly, Baker and Smith (2021) emphasized that AI enhances learning outcomes by adapting to students' individual needs, making learning more efficient. Personalized AIED is at a pivotal stage as continuous technological innovations enable education to reach broader audiences without the limitations of geography or socioeconomic constraints. Access to tailored educational content, whenever needed, can support lifelong learning opportunities provided by higher education institutions and other online learning providers.

Integrating AI-based tools into online learning programs has the potential to help create interactive learning environments that promote deeper engagement. Integrating LLM into education as a supplement to traditional teaching methods can help students explore complex problems (Crompton & Burke, 2024). Accordingly, a recent study by Fischer et al. (2023) found that students who reported using AI-based education tools for feedback while studying can improve their writing and critical thinking skills, further validating the educational value of LLM. The results of the 2023 study aligned with the principles of constructivist learning theory, demonstrating that ChatGPT can act as a facilitator of knowledge construction and improve critical thinking skills as students become active constructors of knowledge rather than passive consumers of AI-generated content (Nitu et al., 2018).

Ethical Considerations and Challenges

AIED usage continues to increase. As a result, many questions arise about the ethical implications of AI in the learning process. Transparency, explainability, bias, and accountability of AI-based systems were among the concerns that prompted many in the academic community and industry to debate the significant ethical considerations associated with the responsible development and integration of AI systems (Ghnemat et al., 2022). As AI-based tools become increasingly prevalent in education, it is crucial to maintain a high standard for academic integrity. During the European Conference on Ethics and Integrity in Academia 2023, the European Network for Academic Integrity (ENAI) promoted using AIED ethically by recommending that students properly acknowledge when AI tools are used, adhere to guidelines that disallow the use of AI tools for authorship of writing, and be aware of potential biases that cause inaccuracies in AI-generated content (Foltyneck, 2023).

The Ethical Debate

One widely debated issue with students using LLMS tools like ChatGPT in academic institutions was the widespread concern that they provided an unfair advantage to students using the AI-based tool. There are many reasons why students are increasingly turning to ChatGPT to complete assignments or exams. Likewise, there are equally as many ways in which students use LLMs. Both converge to contribute to the use or misuse of LLMs in higher education. Understanding what these are may be key to deterring students from cheating while allowing 4-year degree-granting institutions to uphold high standards for academic integrity. Cheating is nothing new to online learning. The increased use of digital tools following the COVID-19 pandemic has drawn attention to students' reliance on these tools and how they may be misusing them. When surveyed, students admit to using unauthorized tools, such as ChatGPT, to write

essays, solve complex problems, and occasionally complete online proctored exams (Bubaš & Čižmešija, 2023). Although most students seem to understand that it is considered academic dishonesty by their professors, many students disagree that it is cheating or that it has a long-term negative impact on the academic integrity of higher education institutions.

We live in a high-pressure society. Social media platforms constantly remind us of our need for more *thumbs up* or likes. Hence, our social conditioning in that digital space is similar to that of the digital learning space. Consequently, when students do not feel connected and supported, they are more likely to seek ways to gain recognition or approval. When students experience high anxiety about competing with their peers or facing other external pressures, such as the need to be promoted or earn a higher income for their families, due to completing online courses, the temptation to use different resources can be appealing. This is where the blurred lines of academic dishonesty become a murky grey area. Students reported that when they feel disconnected from online courses, LLMs on demand help provide support and answers (Mah et al., 2024). The tension between what students and professors view as acceptable usage of LLM in education may be resolved by clear institutional guidelines and training on incorporating and detecting AI in assignments.

Establishing institutional guidelines that provide clear academic expectations may not be enough to deter students from using LLMs to cheat. Research has shown a connection between students who feel disconnected from online courses and cheating. Therefore, professors may see more success in deterring students from cheating by creating more engaging assignments with more meaningful AI-assisted assessments that provide faster feedback, thereby supporting institutional AI-awareness policies (Mah et al., 2023). Perhaps the power of LLMs could be harnessed for good rather than evil. The incorporation of LLMs in education may support the

fourth Sustainable Development Goal (SDG) established by the United Nations (UN) for Quality Education (QE), which aims to provide inclusive and equitable education for all (Costa et al., 2024). Research on online courses has demonstrated that personalized learning can enhance student engagement and improve knowledge attainment. Using LLMs to generate learning materials that support intelligent tutoring systems that are based on a student-centered approach to determine the appropriate pace and learning level, professors could deter students from cheating by refocusing students' attention on improvement from tailored AI-assisted tutoring with feedback (Lin et al., 2023; Schumaker, 2024; St. Hilaire et al., 2022). An adaptive approach to personalized learning with AI-based tutoring support may ensure students receive the appropriate knowledge level. This could lead to improved knowledge attainment, increased student engagement, enhanced learning outcomes, and reduced feelings of disconnection (St. Hilaire, 2022). A student-centered approach to incorporating LLMs in education may enhance learning while deterring students from using them to cheat (Lin et al., 2023).

Current AI detection technology used to identify AI-generated text in online submissions provides multiple options for identifying cheating with LLM. Research shows that HEIs use plagiarism detection tools and natural language processing algorithms to detect ChatGPT by analyzing the language and writing style of submitted work to identify anomalies that indicate possible cheating (Cotton et al., 2024). The current landscape of detection tools available for HEIs comprises five variations of tools. Gammoh (2024) conducted interviews with professors in Jordan who experienced students cheating using ChatGPT and asked for suggestions to mitigate the risk of cheating associated with LLMs. The primary recommendation was to allow faculty access to plagiarism detection software.

Furthermore, a study by Cingillioglu (2023) developed an n-gram BOWs discrepancy language model with a machine learning classifier trained to predict whether students' essays were human or AI-generated. The analysis of the support vector machine (SVM) software compared to other AI-generated text detection software manufacturers, OpenAI, GPTZero, and Copyleaks, found that all tools have accuracy rates above 95%. However, SVM reported with 100% accuracy (Cingillioglu, 2023). Therefore, HEIs have the option of integrating AI-based tools not only to deter but also to detect plagiarism using LLMs.

Policy and Best Practices in AIED Implementation

The rapid adoption of AIED presented an opportunity to establish clear policies and guidelines that ensure students and professors adhere to responsible AI use in education. Federal AI policy is gaining traction for establishing guidelines for the use of private and public AI systems. Particular interest in research on AI is emerging, and legislators are asking for input from educators conducting the work to provide their perspectives on implementing AI in HEI (Crompton & Burke, 2023). States like California are leading the way in establishing ethical guidelines to regulate the use of AI in education. 2023 California S.B. 1288 developed guidelines for integrating AI into curricula, assessments, and administrative tasks. A new bill, the National Science Foundation (NSF) AI Education Act of 2024, was recently passed in October 2024. According to reports from the Senate Committee on Commerce, Science, and Transportation, the act was established to authorize grants and other resources needed to support AI research in education and address related ethical concerns, such as bias, transparency, and the protection of student data. Using a Human-in-the-loop (HITL) model to integrate AI in education demonstrates how AIED can manage ethical concerns while alleviating concerns that AI systems will replace teachers (Bhutoria, 2022; Memarian & Doleck, 2024).

Conversely, not all legislation has been adopted for AIED usage. Mississippi failed to pass a bill that was introduced to establish an AIED task force. It was hoped that establishing the task force would help evaluate how AI will be applied to education and provide policy recommendations (2024 Bill Text MS S.B. 2062). AI-based technology used in education, such as LLMs, has raised objections that further exacerbate the contentious issue of plagiarism in higher education (Novick et al., 2022). The growing focus on AIED makes it imperative that HEI, local governments, and the federal government develop policies and best practices to govern the integration of AI-based technology in education.

AI in Lifelong Learning and Global Access

There is another concern that others say is equally important, in addition to the ethical use of AIED, to address as an area of focus. HEIs should also scrutinize the moral issue of inequality in education. Researchers believe HEIs should champion the cause to mitigate digital learning hindrances to the education ecosystem (Matsieli & Stephen, 2024). One may argue that it is as essential to the integrity of online learning in HEIs as it is to ensure that plagiarism is not permitted. Unlike MOOCs, which offer recorded lectures on demand, AI-based education tools provide on-demand active learning by offering teaching support that engages the learner (Koedinger, 2024). Along these lines, AI-based education tools may solve this and other AIED concerns through some of their benefits for online learning. One benefit of AI-based education tools is their ability to support lifelong learning (LLL). A benefit of AIED in LLL is that it can provide global access to quality education. Providing more opportunities for creating personalized fun activities that facilitate collaboration and increase student engagement improves eLearning by fostering a culture of quality (Altun & Johnson, 2022). Using LLMs in LLL provides opportunities to have innovative assessment approaches that are interactive and

practical for learners (Mhlanga, 2023). Bayly-Castaneda et al. (2024) explored the current integration of AI-mediated solutions for LLL.

Bayly-Castaneda et al. (2024) concluded that using AI-based tools for personalized learning generates an adaptable learning environment that is flexible, while enhancing the acquisition of new skills and knowledge critical for adult learners. Researchers highlight the potential of AI to enhance skill and knowledge acquisition in personalized learning environments by examining individual learning styles, preferences, and needs, thereby improving student engagement, motivation, and success (Palenski et al., 2024; Rawas, 2024). AI-based personalized learning transforms learning from a one-size-fits-all model to a student-centered approach that intelligently highlights patterns to address student deficiencies while supporting enhanced learning strategies, benefiting students, and assisting faculty (Remain, 2019).

In the same manner, LLM AI-based tools can potentially provide global access to quality education for students with learning disabilities, such as ADHD and dyslexia. Christani (2024) conducted a study on teaching interventions for dyslexia and ADHD to mitigate the adverse effects of learning disabilities on student success. The study findings emphasize the importance of creating an inclusive atmosphere of acceptance for all students to learn, underscoring the significance of utilizing AIED in ADHD and dyslexia interventions to achieve high effectiveness (Christani, 2024).

Alternatively, many lecturers are skeptical about integrating AI-based tools, such as LLMs, into LLL. Romero (2024) emphasized the importance of humans in correcting the biases inherent in training data that could potentially compromise human rights and equality. Likewise, Patil and Gudivada (2024) emphasized the need to develop solutions for the enigma of LLM biases and other challenges, such as privacy concerns, toxic content, hallucinations, cost, carbon

footprint, and open-source and low-resource aspects, including untapped non-English resources related to LLMs. These benefits and challenges of using AI-based technology in HEIs underscore the need for research to explore how LLM is perceived in HEIs, and which strategies are the most beneficial for deterring cheating while promoting critical thinking and knowledge acquisition.

Professors' and Students' Perspectives on ChatGPT in Higher Education

There are differing views on whether using ChatGPT is cheating. These opposing perceptions about whether using LLM like ChatGPT is learning or cheating are divisible by the viewpoints of students versus professors (Mah et al., 2024). In some cases, the chasm between differing opinions about what constitutes plagiarism when using LLMs is widened among professors who develop their perceptions of AI acceptance based on university policies (Ofosu-Ampong et al., 2023). Conversely, educators have a predominant consensus on preventing cheating, which unanimously believes that HEIs must create and adopt measures to prevent academic dishonesty (Van Wyk, 2024). Das and Madhusudan (2024) conducted a study to explore students' perceptions of using ChatGPT in academics and the factors that influenced their acceptance of the AI-based tool. The researchers found that factors such as ease of use, interactivity, the ability to personalize how they use LLMs, and their intentions for ChatGPT adoption influenced students' positive perceptions of incorporating ChatGPT.

Furthermore, Ofosu-Among (2023) examined the factors that influence university lecturers' acceptance of using AI in teaching and found that most lecturers were willing to adopt its use. However, less than one-fourth of lecturers surveyed did not accept using ChatGPT. Factors that influenced their acceptance of LLM included their teaching experience, attitudes toward technology, support from their HEI, and the development of AI-based tools. These

considerations should be factored in when professors decide whether to employ LLMs in classes and when choosing how assignments are developed to deter students from cheating using LLMs.

Considerations for Deterring ChatGPT Cheating

It is necessary to develop practical strategies to deter students from cheating using AI tools, which instills in students a sense of the certainty of being caught if they cheat. Additionally, it is crucial to develop HEI policies that promote the ethical use of LLMs. Using advanced proctoring systems and more sophisticated multimodal exam questions has proven effective in mitigating potential academic misconduct enabled by AI technologies (Susnjak & McIntosh, 2024). Interuniversity discussions among HEIs about AIED, academic integrity, learning, and clarification about ChatGPT's limitations and scope in academic tasks must be broadened to collaboratively create fair and enforceable policies to use AI-based tools productively (Mah et al., 2024; Shafqat & Amjad, 2024). Setting clear guidelines about using LLMs will deter students who do not view using ChatGPT as cheating from misunderstanding the rules of AI use and misusing it before they begin their assignment, thereby preventing any appearance of academic dishonesty in students' work (Cotton et al., 2024). Cotton et al. (2023) suggested that another strategy that may effectively deter cheating while enhancing critical thinking skills is for professors to design assignments that require more student engagement. At the same time, they will demonstrate critical thinking skills by participating in activities, such as group discussions, presentations, electronic portfolios, and other assignments that demonstrate knowledge attainment (Cotton et al., 2023; Sankara-Narayanan, 2018). Professors and students may disagree on what constitutes cheating related to using LLM; however, for university systems and their faculty, the strategies mentioned, and others explored through this study to integrate AI in coursework, may help mitigate the challenge of plagiarism in online education in HEIs.

Summary

In summary, this literature review critically analyzed key qualitative and quantitative research related to the role of AIED, specifically in designing strategies to deter online students from using LLM AI-based tools to cheat in urban 4-year degree-granting institutions. The review examined the benefits and ethical challenges of using ChatGPT in higher education, focusing on how professors promote academic integrity in online classes, strategies to deter cheating, methods for monitoring and detecting academic dishonesty, institutional support available to professors, and the ethical implications of AI in education.

This review contextualized the historical blueprint of AI, dating back to the 1950s, and traced its uses in education. It explored AI's ability to enhance learning for students, support professors, and automate administrative tasks (Almasri, 2024; Baker & Smith, 2021; Bundit et al., 2023; Castaneda et al., 2024). The rapid emergence of LLM AI tools, such as ChatGPT, has introduced opportunities to personalize learning but also raises concerns about students using LLMs unethically, which can negatively impact critical thinking skills and academic integrity (Foltynek et al., 2023; Ghosal, 2023; Geryk, 2023).

Key themes derived from the literature review include AIED's historical context, AI applications, ethical considerations, perception of ChatGPT in HEIs, and academic dishonesty. The sources of this review span from 2018 to 2024. The review utilized scholarly articles and research on AI in higher education, personalized learning, and academic integrity. It concludes by exploring how AIED supports LLL, access to quality education, and the perspectives of professors and students on ChatGPT in higher education, as well as strategies for deterring cheating using ChatGPT.

This literature review revealed significant gaps in the research investigating AI tools used to cheat in online learning courses at higher education institutions in the United States. Additionally, existing literature proposes focusing on the ethical implications of ChatGPT in higher education. It identified another gap in the research related to inter-university collaborations to develop standardized policies and procedures that create fair and enforceable practices for the productive use of AI-based tools.

Chapter 3: Methodology and Design

The use of AI-based large language models (LLMs) in higher education is an emerging area of research. As such, it required a method that provided flexibility for conducting the qualitative research while ensuring research rigor (Rosen, 2019). The problem addressed in this study is online professors at urban, 4-year degree-granting institutions are experiencing students using LLM AI tools to misuse or engage in unethical behavior, a situation exacerbated by the 186% increase in distance education enrollment since the onset of the COVID-19 pandemic (Mhlanga, 2023; Parnell, 2022).

The purpose of this qualitative exploratory case study was to investigate online professors' experiences with students' use of LLM AI tools and their perceptions of how course assignments can be created and evaluated to deter cheating at urban, 4-year degree-granting institutions in the United States. I obtained the National University's (NU) Internal Review Board (IRB) on January 9, 2025. The data were analyzed to identify key themes and patterns through a thematic analysis of the transcripts. Additionally, the research plan outlined in this chapter includes the methodology, study participants, procedures, analysis method, and ethical concerns that were addressed as primary components.

Research Methodology and Design (Nature of the Study)

A qualitative methodology was chosen for its ability to explore how people view and experience new phenomena through a holistic understanding of the phenomena in their setting (Given, 2008). It provided flexibility to conduct qualitative research while ensuring research rigor. The qualitative methodology enables researchers to approach the research using a strategy and technique that maximizes topic discovery options through interviews, questionnaires, and/or focus groups. Conversely, quantitative research requires existing data to provide a contextual

perspective, while lacking the value added to the research through the discovery of trends that are developing among the professors who are experiencing this emerging phenomenon.

Mixed-methodology research is a widely used method that has gained popularity in recent years (Hawk & Martin, 2011; Payne & Brown, 2010; Sosu et al., 2008). However, like quantitative methodology, it does not allow the researcher to view the larger landscape of the phenomenon being studied, providing a detail-rich perspective (Creswell, 2007). Therefore, the lack of existing data and trends for an emerging field of study made quantitative and mixed-methods research an inappropriate methodology choice.

There are five types of qualitative research designs: phenomenology, grounded theory, ethnography, narrative analysis, and case studies (Creswell & Creswell, 2018). There are four principles of the qualitative method with multiple designs: action research, evaluation research, field research, and case studies. An exploratory case study research design was selected for the study. Exploratory case studies are valuable for providing a profound description of a specific case or cases that have been explored to advance knowledge (Rosen, 2019). They are ideal for conducting research when there is limited knowledge about a specific phenomenon that is believed to have future implications that need to be discovered, such as strategies for using LLM AI to enhance knowledge transfer in eLearning (Given, 2008). When referring to case studies in research, the case to be assessed is an integrated unit that can be a group or a setting to be studied holistically (Check & Schutt, 2017).

Phenomenology is a qualitative research design frequently employed when researchers aim to systematically examine a lived experience as it actually occurs, with the goal of gaining insight (Jackson & Usher, 2014). Although the design is suitable for studying a phenomenon in its natural setting as it occurs, such as interviews of individuals who experienced a natural

disaster in a specific location, it is not appropriate for emerging experiences that are ongoing. Therefore, the phenomenology design was not appropriate for the study, as students will have ongoing access to LLMS and the potential to use it for future assignments. Phenomenology was rejected as the research design for this study. Study participants were interviewed and invited to join a subsequent focus group to share their experiences of the phenomena by responding to prompts presented to the focus group about their experiences.

For this study, I examined the experiences and strategies of professors aimed at deterring students from using LLM AI to cheat in urban, four-year degree-granting higher education institutions in the United States. Interviews and focus groups were conducted to gather data from a sample of professors with experience in addressing online higher education students who cheat or misuse LLM AI in online learning at urban, four-year degree-granting institutions in the United States. Social media was used to solicit voluntary participation from those who met all the inclusion criteria to participate in the case study.

Population and Sample

The population for this study comprised all university professors who create and evaluate course assignments at a United States university and have encountered online students who have been suspected of cheating or misusing LLM AI. However, interviewing all professors was not feasible. Therefore, I narrowed the population of this demographic to a representative sample. The representative sample included professors who taught at a United States university who met the following inclusion criteria: (a) the professors have participated in online instruction, (b) the professors were required to be faculty members a college/university in urban United States, (c) the professors had experience(s) with one or more students who they have suspected have used LLM AI to misuse or cheat in online courses.

Purposive sampling is a standard approach in qualitative research when the researcher aims to study a specific phenomenon and requires particular inclusion criteria. Therefore, purposive sampling was employed to select participants, thereby minimizing bias in the sample and facilitating the generalizability of the results to the population (Walliman, 2015). I employed a snowball recruitment technique, combined with the purposive sampling method, to recruit new participants. This typically occurs in cases involving hard-to-find participants, often due to research limitations.

Creswell (2013) suggested that researchers in case studies should recruit between five and 15 study participants who have experienced the phenomenon. After the NU's IRB granted permission, I recruited participants by posting a flyer on the landing pages of various social media accounts: Facebook, Twitter, Instagram, and LinkedIn. I did not post on specific group pages. I provided information on the flyer to highlight the study's purpose, the problem it addresses, the procedures used, and the inclusion criteria. Potential participants contacted me by phone or email. I conducted a screening to verify that the potential participant met the inclusion criteria and confirmed their email address.

A consent form was emailed to the prospective participants once it was determined that they met the inclusion criteria. I received signed consent forms electronically. I scheduled the one-to-one Zoom interviews. One-to-one interviews with the participants were conducted and recorded with their consent. Interviews are among the multiple data sources from which a qualitative researcher can retrieve information. Qualitative research favors interviews because nuanced insights are abundant in participants' experiences, perceptions, and feelings that can be collected through one-on-one interactions (Flick, 2025). The second form of data collection was

through a focus group. After each one-on-one interview with the participants, they were invited to attend the focus group. Recruitment ended once saturation was met.

According to Aguinis and Solarino (2025), all interview data adds value to the research, even if the communication is perceived as inadequate. The results may reveal important information about the phenomenon, rendering all the collected interview data useful. Hence, if the study participants meet the participation criteria, no interview data is classified as bad (Aguinis & Solarino, 2019). An in-depth interview process was selected for the exploratory case study. In-depth interviews can be ideal for gaining insights and a deep understanding of participants' actions related to a particular phenomenon (Johnson & Rolands, 2012). Open-ended interview questions enabled the research participants to share their experiences openly and without interruption, making in-depth interviews the method of choice for this research.

I chose to conduct semi-structured interviews, in which participants were asked predetermined questions. These questions, however, were presented with the flexibility to reorganize them according to real-time adjustments made during the interview process, based on decisions, the emergence of issues, or unanticipated responses that arose during the ongoing conversation (Bryman, 2012; Buys et al., 2022; Ryan et al., 2009). A benefit to this interview method was its flexibility for follow-up questions, which led to more in-depth, context-rich insights into the case being explored. Semi-structured interview protocol was helpful for qualitative research, unlike other interview styles, which are more like casual discussions without any predetermined questions or structured interview questions which are very restrictive as an interview style because they are based on a list of prewritten questions that do not allow the interviewee room to flow into ideas that they feel are important for the study (Morris, 2015; Sarma, 2015; Seidman, 2019).

Materials and Instrument

I was the primary instrument for data collection. I gathered information from the representative sample (participants). I conducted a round of one-to-one interviews using an interview protocol (Appendix D). The protocol consisted of prewritten open-ended questions scrutinized by a panel of experts in advance. I asked the ten open-ended, semi-structured questions from the protocol during the 60 to 90-minute interview. Following the interview protocol, I ensured that every participant was asked the same questions within the same time frame, thereby reducing researcher bias and demonstrating the study's trustworthiness. The interview protocol questions were rooted in the literature. Those participants who consented to answering additional questions were asked to participate in a focus group to provide further information.

A focus group is a qualitative data collection technique that gathers information from participants through an organized social event designed to gain insight into their attitudes, feelings, beliefs, experiences, and reactions (Howsen, 2023). I facilitated the focus group. I followed the focus group protocol to uncover additional insights revealed through the interactions between the study participants and their peers (Appendix E). When presenting the discussion prompts, I guided the discussion by asking open-ended questions to explore themes or topics that emerged during the interaction. Kalvemark et al. (2004) found that focus groups were a valuable research tool for power differences. This could be the case with professors who are tenured at a university and those who are not. A power imbalance or tension can make data gathering difficult. Therefore, as the moderator, I followed the interview protocol, including instructions that guided the study participants.

The protocols used in this study went through a field test process. I assembled a panel of three experts well-versed in the research area with whom I collaborated to ensure that the questions I developed were clear, focused, and meaningful for eliciting feedback during the interviews and focus groups. During the collaboration efforts, we ensured the relevance of the questions across all focus areas of the research to elicit in-depth information from participants. The panel of experts, comprising two higher education professionals (Ph.D. and M.D.) and a state government official (J.D. and Ph.D.), regularly conducts interviews, and I was able to use their extensive knowledge and experience of the phenomena to facilitate a more dynamic and productive interview process. Additionally, the experts confirmed that the questions were appropriately semi-structured and open-ended. The experts' feedback was highly considered, and adjustments were made to the questions accordingly. They agreed I should allow participants to be flexible in their responses, encouraging participants to share details and nuanced insights for the qualitative exploratory case study research.

Study Procedures

I conducted this qualitative exploratory case study, adhering to the highest ethical and regulatory requirements for human subject research. I obtained approval from the NU IRB and completed the entire application process. Next, I completed the Collaborative Institutional Training Initiative (CITI) training to ensure an understanding of ethical study procedures. This training helped me learn how to protect the rights, welfare, and well-being of research participants. I also complied with applicable state, federal, and institutional regulations to uphold the legal and ethical standards of the research.

The data collection steps began with designing a recruitment flyer that clearly outlined the study's purpose, the problem being addressed, the procedures used, and the inclusion criteria.

I began recruiting participants for the study. The flyer was disseminated through my landing page on the following social media platforms: Facebook, Instagram, Twitter, and LinkedIn. I provided a dedicated email address, phone number, and text messaging service for potential study participants who wished to volunteer for the study, allowing them to communicate their interest in the study. After they contacted me, I verified that they met the participant inclusion criteria during the initial communication with potential study participants. Ensuring participants met the inclusion criteria took place via a brief phone conversation, just before the interviews began on Zoom. However, one participant was excluded from the research due to their apparent lack of experience with the phenomenon being studied. Although they attested to meeting the study participation criteria, it became apparent during the interview that they did not. I kept a record of all the communication from potential study participants who were chosen and those who were selected due to not meeting the inclusion criteria.

A detailed consent form, which included the study's purpose, procedures, potential risks, confidentiality measures, and the voluntary nature of participation, was emailed to study participants during the selection process, based on verification that they met the inclusion criteria. I received copies of the signed consent form via email. I scheduled the one-to-one Zoom interviews at a convenient time for the study participants. For privacy, all interviews were conducted from my home office. Each interview was scheduled to last between 60 and 90 minutes. The Zoom interviews were recorded with the study participants' consent. At the end of every one-to-one interview, I invited the participant to participate in the focus group.

The participants' information was confidential. A gender-neutral pseudonym was assigned to protect the identities of the study participants and to promote a more inclusive approach. I engaged participants who consented to participate in a focus group discussion by

providing discussion prompts for additional insights into the phenomenon. All recorded Zoom interviews, the focus group discussion, and related data were saved and password-protected on my laptop to restrict access to the data to my access only. Data collection continued until data saturation was complete and no new information emerged from the interviews or the focus group. The information from the one-to-one interviews and the focus group was used to triangulate the data. After the data collection process was complete, I informed my research committee and IRB about the completion of this phase.

The final data collection step involved leading a focus group, which was used to complement the previous one-to-one interviews and provide a more in-depth exploration of professors' experiences and perceptions on how they created and evaluated course assignments to discourage online students from using LLM AI tools to cheat at four-year degree-granting institutions in the United States. Focus groups are guided, yet informal, group discussions designed to help elucidate emerging themes. The in-depth discussion extends the one-on-one interviews (Gundumogula, 2020). Participants were selected based on their experience with the phenomenon and the information they could add to the area of knowledge for the exploratory case study. The focus group was conducted in a virtual town hall meeting style, utilizing Zoom as a secure online conferencing platform. Krueger (1994) suggested that a group of at least three participants is optimal for information gathering during a focus group. The online focus group included seven study participants. The online focus group was recorded after receiving permission from each participant. The resultant data was transcribed and analyzed using NVivo, a qualitative data analysis software, to reveal themes and patterns in the study findings. This exploratory case study adds to the body of knowledge on AI in higher education.

Data Analysis

After completing the data collection process, which included Zoom interviews, a focus group, and video recordings, these were transcribed using the Zoom transcription feature. I ensured that the transcriptions captured all the details, including pauses, laughter, and other non-verbal cues, if they were meaningful for interpretation. Braun and Clarke (2006) proposed six phases of data collection, which include familiarizing oneself with the data, initial code generation, searching for themes within the data, reviewing uncovered themes, developing a theme nomenclature, and producing a final report. This was the basis for the data analysis procedure that I followed. I selected it as an analysis technique for the current educational study because it is a data-driven scaffold that can capture content and ideas within qualitative data. Due to the desire to illuminate emerging themes identified within the dataset and the lack of pre-existing content to classify, thematic analysis was deemed the most suitable approach. The data is presented in narrative form, accompanied by a visual aid, to help illustrate the data in Chapter 4.

The initial coding round involved manually identifying key phrases, concepts, and initial themes by highlighting them in the transcripts. The steps to manually code the transcription began with reading the transcripts to understand the content and identify potential patterns that emerge. Next, I assigned codes as short phrases or words to capture the text's intended meaning, matching the study participants' experiences. Color codes were used to highlight themes in the text. I grouped patterns and similarities among the codes to highlight overarching themes. The codes were compared and modified to convey meanings and avoid duplication or ambiguity. After defining and naming the themes, I considered how they related to the broader context of

my research. The responses were read with the research questions in mind while coding to create categories of codes (Belotto, 2018).

The most pervasive patterns that emerged were selected from the data based on their relevance to the research questions. After defining and refining themes, the final categorizations of the codes were determined. The highest-ranking themes were extracted and analyzed utilizing NVivo, a qualitative data analysis software. NVivo was used to organize, categorize, and cross-reference the data so that no potential themes were omitted. Multiple measures previously discussed were taken to ensure the credibility and trustworthiness of the analysis.

To organize the data thematically and categorically, I used a table to visually summarize the data and track the emergence of the themes. I utilized Braun and Clarke's Phases of Thematic Analysis (Table 1) to identify themes and gain new insights into study participants' perceptions of their experiences, thereby minimizing researcher bias (Braun & Clarke, 2006). As the researcher, my role was to collect data utilizing the study procedure previously outlined, including data collection, analysis, and transcription verification. I facilitated the one-to-one Zoom interviews and the focus group. I interpreted the data cohesively and reported all findings in a fair and transparent manner, following a rigorous study process.

As themes emerged during the data coding and categorizing, they were documented, noting how the research data supported them. Triangulation was met by comparing the interview and focus group data. This ensures the data is trustworthy. The credibility of the research findings is crucial in the qualitative methodology. This cross-checking strategy helped me understand the details and complexities of professors' experiences and the strategies they employ to deter students from using LLM AI to cheat. I employed member-checking to ensure the accuracy of the data transcription and prevent any transcribed information from being taken out

of context. Member-checking was a step in my cross-checking strategy. I provided each study participant with a copy of the transcript from their interview to verify its accuracy. Additionally, after I wrote the theme narratives in Chapter 4, the participants were asked to review their content to ensure that the data provided accurately reflected the themes that emerged. This was instrumental in ensuring that the qualitative exploratory case study followed a robust, credible, and well-rounded sampling process, thus increasing the trustworthiness of the data (Yin, 2018).

Table 1

Phases of Thematic Analysis

Phase	Description of the process
1st Phase - Familiarize yourself with your data:	Transcribing data (if necessary), reading and re-reading the data, and noting down initial ideas.
2nd Phase - Generating initial codes:	Coding exciting features of the data systematically across the entire data set, collating data relevant to each code.
3rd Phase - Searching for themes:	Collating codes into potential themes, gathering all data relevant to each theme.
4th Phase - Reviewing themes:	Checking if the themes work concerning the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5th Phase - Defining and naming themes:	An ongoing analysis is necessary to refine the specifics of each theme and the overall narrative the analysis presents, resulting in clear definitions and names for each theme.
6th Phase - Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back to the research question and literature, producing a scholarly report of the study.

As themes emerged during the data coding and categorizing, they were documented, noting how the research data supported them. I employed triangulation by comparing and cross-validating the data from the Zoom one-to-one interviews and the focus group to ensure the credibility of the research findings. To ensure trustworthiness and authenticity of the data, I used member checking as a technique during the analysis. I provided the study participants with a

copy of the transcripts for their review to verify the accuracy of the data. In compliance with the IRB standards the transcriptions will be available for three years after the publication.

Assumptions

Assumptions in research methodology are the principles or beliefs accepted as accurate without further validation (Theofanidis & Fountouki, 2019). These assumptions provided a foundation for building a study and guided the research design, data collection methods, and analysis techniques. They can be explicit or implicit and may be based on prior research, theoretical frameworks, or the researcher's personal beliefs. Identifying and acknowledging assumptions is critical in a study, as they can influence the interpretation of the results and the generalizability of the findings (Braun & Clark, 2006). The integrity of the study relies heavily on the participants' assumptions, which are beyond my control as the researcher, regarding their perspectives expressed during the study procedure via the online social media flyer, one-on-one interviews, and a focus group.

I assumed that participants provided honest, sincere, and candid responses during their one-to-one interviews and actively engaged in the focus group discussions, free from any concerns about potential repercussions or an inclination towards socially desirable responses. Additionally, I made assumptions regarding the accuracy of the data collected, the classification of the themes, and the methodology used in the study. Finally, I had some inherent biases about using LLM AI tools in online learning, but I assume that what the study participants provided were their honest thoughts about the phenomenon, which were beyond the researchers' control.

Limitations

Limitations refer to any potential weaknesses or issues identified by the researcher in the study (Creswell, 2013). Limitations are beyond the researcher’s control. When analyzing the

outcomes of this study, it was essential to be aware of several limitations that were present. First, as an exploratory case study, there was a natural limitation to the documentation about the phenomenon, as it is a new educational concern to be explored. As a result, there was limited access to data on the use of LLMs in higher education, as the phenomenon is an emerging research topic. The nature of the research questions imposed additional limitations on the study's sample size, as the qualifying boundaries outlined in the inclusion criteria established to select the study participants were also considered. The sample was exclusively comprised of individuals who had encountered the phenomenon within urban areas of the United States, potentially limiting the broader applicability of our findings. Furthermore, the insights derived from this study presented a momentary glimpse rather than a comprehensive exploration of the participant-provided data. Broadening the scope to encompass all higher education institutions in the United States enhanced the expansiveness of our results.

Another limitation was that the participants had to recall past events as accurately as possible based on their ability to remember the sequence and details of specific experiences. This could have presented time constraints for the study. To address these limitations and ensure thorough discussions, I arranged for each participant to engage in a detailed interview lasting between 60 to 90 minutes. The next study limitation was that the one-on-one interviews took place on Zoom, further limiting the study to those who are technologically savvy enough to participate in the online interview.

The final limitation of the study was that one study participant was removed due to evidence obtained during the interview process that they did not meet the participation criteria, despite having attested to meeting the qualifications during the prescreening process. Despite these limitations, I focused on uncovering elements of the phenomenon that were previously

unknown and/or emerging themes in the field of study. The exploratory case study emerged as the most suitable methodology for advancing knowledge to enhance pedagogical practices and inform future research directions (Riad, 2023).

Delimitations

Hufford (1996) described delimitations as boundaries that delineate the scope of a study, outlining the areas the research intentionally avoids and the objectives it does not seek to achieve. Researchers deliberately apply constraints to their research studies. I recruited professors in urban four-year degree-granting higher education institutions in the United States. The purposeful delimiters for this study are: (a) the professors have participated in online instruction, (b) the professors were required to be faculty members of a college or university in urban USA, (c) the professors have had experience(s) with one or more students who they have suspected have used LLM AI to cheat in online courses.

Ethical Assurances

Ensuring the ethical treatment and protection of all participants in this exploratory case study was paramount, with comprehensive measures implemented to maintain integrity throughout the research process. Leavy (2017) emphasized the importance of professionalism and securing proper authorization during participant interactions. This study meticulously addressed any ethical concerns, considering the risks and benefits to both the participants and me as the researcher, as well as the potential impacts of data handling, communication, and future data utilization. Before collecting data, I obtained approval from the IRB at the NU. Participants were thoroughly informed about the study's nature, including its risks, benefits, and available alternatives, ensuring they had ample opportunity to ask questions. Efforts were made to maximize benefits and minimize potential risks associated with the research. Informed consent

was obtained from all participants, clarifying the research's purpose, methods, and intentions, with the assurance of voluntary participation.

The privacy and confidentiality of participants were strictly maintained, ensuring that no personal identification was disclosed or used within the study. Participants provided informed consent voluntarily, as the study posed minimal risk, comparable to or less than everyday life situations, thereby minimizing the likelihood of physical, psychological, or privacy-related harm. Data collected was securely stored in a password-protected electronic database on my laptop. The gender-neutral pseudonyms used to identify each participant were stored in a password-protected digital file, accessible only to me. Gender-neutral pseudonyms for participants provide each participant with identity security. Additionally, no student information was published if a professor discussed particular student situations. No student's names were shared during the interviews.

Researcher bias is the last area of concern I addressed. To address such bias, being completely transparent about my positionality was extremely important. With over 10 years of experience in procurement and supply chain management, including eight years within Georgia's strategic procurement division, I am aware of potential biases. Although my professional background does not inherently introduce ethical conflicts, any issues that arise will be addressed to maintain objective analysis.

Reflexivity and positionality are critical in understanding the researcher's relationship to the study's context, subjects, and overall research environment. Bloomberg and Volpe (2019) and Smith et al. (2021) highlighted reflexivity as a technique for the researcher to identify and articulate their unique stance within the research landscape. I kept a journal and took notes throughout the research process to be reflexive and cognizant of potential bias.

Summary

The problem addressed in this study was online professors at urban, 4-year degree-granting institutions are experiencing students using LLM AI tools to misuse or engage in unethical behavior, a situation exacerbated by the 186% increase in distance education enrollment since the onset of the COVID-19 pandemic (Mhlanga, 2023; Parnell, 2022). A gap in online learning research for higher education institutions was identified in online professors' strategies to overcome online students' abilities to use AI tools to cheat in online learning courses. This chapter outlines the qualitative methodology and exploratory case study design selected for this study, aiming to fill the gap by examining the experiences and perceptions of online professors. Further investigation into how they create and evaluate course assignments to discourage online students from using LLM AI tools to cheat at urban, four-year degree-granting higher educational institutions in the USA was sought. An exploratory case study design was chosen because it is an exploratory research technique ideal for conducting longitudinal research when there is limited knowledge about a specific phenomenon that is believed to have future implications that need to be discovered.

The study procedure includes a social media flyer, one-on-one interviews, and a focus group. This allowed me to collect demographic data and gain abundant, nuanced insights about participants' experiences, perceptions, and feelings, which were collected through one-on-one interactions. High ethical standards were maintained throughout the study, which was approved by the NU IRB. The data were analyzed to identify key themes and patterns through a thematic analysis of the transcripts. The research plan outlined in this chapter comprises the methodology, study participants, procedures, analysis method, and ethical concerns as its primary components.

Chapter 4: Findings

The problem addressed in this study was online professors at urban, 4-year degree-granting institutions experience students using LLM AI tools to misuse or engage in unethical behavior, a situation exacerbated by the 186% increase in distance education enrollment since the onset of the COVID-19 pandemic (Mhlanga, 2023; Parnell, 2022). The purpose of this qualitative exploratory case study was to investigate online professors' experiences with students' use of LLM AI tools and their perceptions of how course assignments can be created and evaluated to deter cheating at urban, 4-year degree-granting institutions in the United States. The rapid integration of LLM technology since 2020 has sparked an academic debate regarding the ethical implications, challenges, and benefits of students using AI in higher education. It also initiated discourse about the use of AI technology in education, particularly in relation to academic integrity, plagiarism, the impact of AI misuse on instructor design choices, ambiguity in institutional AI policies, and variations in the policies governing its use in online learning (García-López et al., 2025).

This chapter highlights the strategies employed to identify patterns across emerging themes and the interpretation of the findings elucidated through the qualitative interviews and follow-up focus group discussions with the study participants. The recruitment process that followed the IRB approval is explained. The chapter concludes with a summary of the study's key findings.

Trustworthiness of the Data

The quality criteria for qualitative research, credibility, transferability, dependability, and confirmability, were conveyed through the interpretation of one-on-one interviews, a focus group discussion, and member checking procedures to ensure the trustworthiness of the data. These

qualitative research procedures were adopted and implemented using strategies consistent with Lincoln and Guba's (1986) seminal overview of the four criteria to create trustworthiness within research activities. There was considerable debate within the scientific research community about what constitutes validity in qualitative research compared to that in quantitative research. No conclusive decision was made about its definition, and the differing approaches to validity for qualitative research (Flick, 2025). Therefore, Guba and Lincoln (1986) developed criteria designed to be consistent with the process of proving validity or trustworthiness in research.

Credibility. A key factor in determining trustworthiness in qualitative research is demonstrating the congruence of the study's findings. In other words, credibility addresses the fit or truth value between the study participants' views and my interpretation of those views (Korstjens & Moser, 2017). The first of these qualitative criteria is credibility. I adopted and implemented three strategies that are commonly used in qualitative research to ensure the credibility of the themes that emerged during the thematic analysis of this qualitative exploratory case study.

The first strategy that I implemented and used was the prolonged engagement strategy. Prolonged engagement refers to the researcher spending an extensive amount of time with the phenomenon or conducting long interviews to identify potential distortions, test for misinformation, become familiar with the data to uncover rich insights, and build trust (Guba & Lincoln, 1986; Moser & Korstjens, 2017). I reviewed each one-to-one interview recording and transcript for three weeks to ensure that the data that emerged during my interpretation was accurate. As a result of investing sufficient time to familiarize myself with the interviews, I uncovered more themes and insights during consecutive reviews than I did during the first transcript review.

The second strategy I implemented to establish the credibility of the research was member checking. After an extensive review of the study participants' interviews and the focus group, I emailed the transcripts of the one-to-one interviews, along with the interview interpretation themes and key insights that emerged from the transcripts, to each research participant for review. I requested that each participant review the transcripts, spend adequate time reflecting on them, and provide any feedback regarding the accuracy of my interpretation within a week (Chambliss & Shutt, 2024; Creswell, 2014). Each study participant was allowed a week to review the transcripts. I noted any responses that I received that either validated my interpretation of the transcripts or suggested updates based on their intention to answer the questions asked. Those adjustments were also noted in my reflexive research diary notes for the research study.

The final strategy I implemented to establish the credibility of the research was methodological triangulation. For methodological triangulation, multiple methodologies are employed to gather data and study the phenomenon, ensuring that the initial research findings accurately represent the data's meaning (Arias Valencia, 2022; Ellis, 2021; Flick, 2019; Fusch et al., 2018; Moser & Korstjens, 2017). I achieved triangulation by using one-to-one interviews and a focus group as multiple sources of data. Natow (2020) posited that elite interviews with education leaders are a crucial data source, providing data that is not easily obtained from other sources.

Transferability. Lincoln and Guba (1986) developed a second criterion to achieve trustworthiness and transferability. Transferability refers to the extent to which research study findings can be replicated in similar settings or with similar respondents, as provided through *thick descriptions* of the research study, its setting, and participants (Geertz, 1973; Moser &

Korstjens, 2017; Makel et al., 2022). I achieved transferability by providing *thick descriptions* of the research study context, which included my interpretations, experiences, feelings, biases, and impressions of the phenomenon, thereby making the study findings more meaningful. I have included the interview and focus group procedures, along with changes in the interview questions that emerged through the iterative research process. The description I provided includes excerpts from the interview and focus group protocols, as well as ad hoc questions posed during the interviews and focus group activities.

Dependability. The next criterion to establish trustworthiness is dependability. Dependability is concerned with demonstrating transparency in the research steps taken throughout the study (Moser & Korstjens, 2017). To verify that the analysis process aligns with acceptable research practices, I provided records of the research process, including the complete set of notes regarding decisions made and reflective thoughts throughout the entire study, to achieve dependability. I began with a detailed explanation of the purposive sampling process used to select study participants, including all the steps that led up to and encompassed the NVivo analysis, which organized the themes that emerged during the qualitative exploratory case study.

Confirmability. The fourth and final criterion that is required to establish trustworthiness is confirmability. Confirmability upholds the integrity of the data by demonstrating how the study findings were derived (Nowell et al., 2017). To ensure the inter-subjectivity of the data, the focus is placed on the interpretation process used during data analysis (Moser & Korstjens, 2017). Although confirmability is closely tied to dependability, it extends beyond data collection to include data checks and rechecks throughout the study, as well as clear coding that indexes and categorizes text to identify themes that emerge. To achieve confirmability in the study, I

employed line-by-line coding, which was beneficial for ensuring that close attention was paid to the views of the research participants rather than my preconceptions or biases. I also confirmed the themes that ultimately emerged from the analysis through the member checking procedure, as previously discussed. Additionally, a reflexive research journal was maintained to supplement the interviews and focus group discussions.

Results

This qualitative exploratory case study was rooted in two research questions. To answer those questions, this chapter is organized to describe the methodology I used to explore the phenomenon of professors experiencing students using LLM-AI in online courses of higher education institutions. Eleven study participants completed one-to-one interviews that lasted 60-90 minutes using a secure Zoom meeting platform. Each participant was emailed a consent form that outlined the voluntary nature of study participation, the procedures for recording interviews, and the confidentiality of the study. Signed consent forms were returned electronically via DocuSign. One study participant was removed from the study due to evidence during the interview process that they did not meet the participation criteria. Ten out of eleven interviews had excellent sound quality. I continued the interview despite poor sound quality and repeated any questions that were unclear due to the technical challenges. I was able to use the data collected during the interview.

The professors who participated in this study were bound to this exploratory case study through their role as online professors at urban 4-year degree-granting institutions in the USA. Next, they were required to hold an active faculty status at a higher education institution. Finally, they were required to have experience with students using LLM AI tools like ChatGPT in their coursework. This exploratory case study primarily used one-on-one interviews as its data source.

The secondary data source was the follow-up focus group used to uncover deeper insight into the themes that emerged for triangulation purposes.

The participants' demographic characteristics are listed in Table 2. There were ten participants with experience as educators, ranging from four to thirty years. The spectrum of higher education institution categories where the phenomenon was experienced included R1 public universities, R2 public universities, R1 private universities, HBCU private medical schools, HBCU public land-grant institutions, and private graduate institutions. Their teaching modality was asynchronous, synchronous, hybrid asynchronous, and both.

Table 2

Demographic Information of the Research Participants

Participant Pseudonym	Experience (Years)	University Category	Teaching Modality
Alex	15	R1 Public University	Asynchronous
Jordan	30	R2 Public University	Hybrid Asynchronous
Taylor	17	Private Graduate Institution	Asynchronous
Casey	27	R1 Public University	Hybrid Asynchronous
Skyler	12	HBCU - Private Medical School	Asynchronous
Morgan	4	Private Graduate Institution	Asynchronous
Avery	15	HBCU - Public Land-Grant University	Hybrid Asynchronous
Drew	16	R1 Public University	Asynchronous
Cameron	17	R1 Public University	Asynchronous
Peyton	23	R1 Private University	Asynchronous and Synchronous

The qualitative data collected through one-on-one interviews and a focus group were analyzed using a reflexive thematic analysis (RTA) approach. Braun and Clarke (2020) posit that following the six-phase framework of systematically reading and rereading transcripts helps researchers gain a deeper understanding of the themes that emerge from the data. This is important for fully grasping the phenomenon of online professors' experiences with students' use of LLM AI tools and perceptions of how to design and assess course assignments to deter cheating when AI is not used correctly at HEI in the United States. Following the six phases of analysis, which included familiarization with the codes, generating codes, coming up with themes, reviewing and refining themes, providing clear descriptions of the themes, and writing the findings, the themes in Table 3 emerged (Dawadi, 2020).

The transcribed interviews were analyzed through prolonged engagement and iterative reading procedures, with careful attention given to the participants' experiences shared during the interviews, including specific examples that elicited rich data (Korstjens & Moser, 2017). Next, a manual coding process was conducted to uncover ideas and patterns. I then uploaded the data files into NVivo software and coded them using parent and child nodes that emerged during the manual coding procedure. NVivo provided data related to the visual frequency, relationship, and key theme clusters that emerged. The themes that were produced were compared to the themes that emerged during my manual analysis procedure. The emergent themes and participant contributions for research question 1 are listed in Table 3.

Table 3

RQ1 Emergent Theme and Participant Contributions

Research Questions	Themes	Participant Contributions	Participants
RQ1. What are online professors' experiences with student use of LLM AI tools in HEI online courses, and their perspectives on the ethical implications of designing assignments without proper guidelines for AI integration?	Theme 1a. Ethical Implications of AI in HEI	10/10	Alex, Jordan, Taylor, Casey, Skyler, Morgan, Avery, Drew, Cameron, Peyton
	Theme 1b. AI As a Barrier to Knowledge Construction	10/10	Alex, Jordan, Taylor, Casey, Skyler, Morgan, Avery, Drew, Cameron, Peyton
	Theme 1c. AI Integration to Supplement Traditional Learning	6/10	Alex, Jordan, Skyler, Morgan, Avery, Peyton
	Theme 1d. AI as Assistive Tools for Students with Learning Disabilities	6/10	Alex, Jordan, Taylor, Skyler, Morgan, Avery

Theme 1a: Ethical Implications of AI in HEI. This theme provided insight into how university policies and assignment design promote responsible engagement with AI. Ten out of the ten participants upheld this theme. One participant had a divergent view. The theme highlights the role of institutional guidance in shaping tasks to uphold academic integrity and build students' AI literacy and critical thinking skills. Within this theme, the research participants described how the misuse of AI tools to complete assignments produces unintended consequences for the students. Jordan described the dilemma in using AI:

> It can take some of the load off, but the unintended consequence is that if I take too much of the cognitive load off, if I have it do it for me, it's the same as having a classmate write my paper for me, and I'm not going to learn the subject.

Casey conveyed their concerns:

I'm here trying to help students understand that learning still matters. That learning is still important. So, it's that the really ethical questions for me are not so much about what student, it's the compromise position, the bankrupt position that we've put learning in.

Skyler described how his institution underscores the importance of using AI ethically, introducing it during orientation:

We put great emphasis on how to operate effectively in a digital world. So we come from that lens. And we are perfecting that process. Do we have it? Is it perfect? Absolutely not. Do we have folks violating that? Yes, and we do have the ethical conversations during orientation as well with our students. So, the students are helping us refine our policies as we go.

Morgan echoed Skyler's sentiment by emphasizing formal policy limits and educational guidance:

Yes. So we have implemented a policy that AI match can be no more than 30% in students' submitted work… We encourage them to use it, but we just want them to use it ethically. And you know, remember that this is an academic institution. Give credit. Cite as needed.

Conversely, Peyton introduced an alternative epistemological viewpoint:

I am listening to this whole thing about ethics and all of the stuff, and I have a whole different take on it. You know, okay, it's where the ethics are supposed to be. At least where truth is pursued and we get truth, how we get it. Now, one of the things that has been bubbling up all along is that there are some people who claim to have the corner on truth. And there's a whole new discipline, talked about epistemicide [study of ignorance],

> where so much truth has been suppressed from so many areas. And the problem is that there are some people who see themselves as the guardians of truth. So if AI gets truth to us, who the heck cares where it comes from, as long as we can establish that it's truth.

The majority of the research participants perceived that when AI is used ethically, it is a tool that benefits knowledge. The research participants perceived that the resultant effects of unethical AI use in HEI include plagiarism, compromised credibility due to AI-generated misinformation, an inability to transfer AI information to applied knowledge, students' lack of ownership of knowledge, violations of university academic integrity policies, the intellectual bankruptcy of learning and epistemological disruption in higher education among other APA violations that make AI unethical use easy to detect. Alex shared concerns about the use of misinformation and the impetus for students' pursuit of higher education degrees:

> It's concerning to me that they're putting this information out or putting information in their papers, and the information is actually not true. So, it could be plagiarized, but it could also be inaccurate information. Second thing that is really scary for me is that there are students who are really good at using AI, which expedites the amount of work they turn in, how quickly they're able to complete whatever that assignment is, because they understand how to work the system… But I also think that it does go back to a question of ethics as well as a question of, are you in the university to get this degree or to explore truth? Or are you just trying to get the degree so you can move on at any means necessary?

Taylor noted, "I think they don't understand plagiarism in general. So, if you don't understand the ethical implications of that, because you don't understand it, then I think we're a little bit in trouble." Avery said, "You can't be ethical and unethical at the same time, you see.

So, it’s probably unethical to use and turn in. But I don’t see how it’s unethical to get a concept or a construct and then build on it.” Drew reflected on conditional ethical use:

> I think that it could be an ethical issue depending on how you use it. And at the same time, isn’t the case with everything?... I don’t see an ethical issue with it, because like I keep saying, if you don’t know how to prompt appropriately, that’s going to require some effort on your part.

Cameron emphasized instructors' responsibility to promote ethical AI use:

> I think it makes sense, but I think like ethically, it's like if we're not teaching our students how to use it or I mean, even if we don't know how to use it or what's appropriate, then we're setting them up almost for failure because it is like you're letting someone else do the thinking and then you're taking that and saying it's your own. Even though you asked the question, you didn't answer it. Someone else answered it for you, so I almost think, like ethically, it's just like leading them down a path where if we don't address it it's at some point probably going to end up not fantastic for them because eventually it's going to be found out sounds terrible but you know, eventually it's like, oh, well, this isn't your work. So how do I know that you're actually doing the job that you're, that I hired you to do?

Study participants referenced in their statements how they recognize AI-generated content and apprehensions regarding students' digital literacy, knowledge, skillset, and tool misuse. They also shared the strategies they employed following detection, which was the second sub-theme that emerged for this Ethical Implications of AI in HEI theme. The research participants provided rich information about the behaviors that students who misuse AI demonstrate, which makes AI use easier to detect when submitting AI-generated information as

their own, a sub-theme that emerged. The behaviors shared by the study participants are: (a) copy and paste, (b) inauthentic writing tone, (c) 30% or greater AI match threshold reached, (d) missing citations, and (e) the work is found on websites.

Theme 1b: AI as a Barrier to Knowledge Construction. The second theme emerged during discussions on instructors' methods for detecting AI-generated submissions and their concerns about students' digital literacy, subject-matter knowledge, and skill development. Ten out of the ten participants upheld this theme. Through discussion, we explored the motivations that drive learners to use LLMs as a shortcut for completing coursework, and this theme emerged. Casey described the challenges of AI use:

> One of the challenges that we have right now is the challenge related to what does it mean to know? What does it mean to know? And then related to that is where does knowledge exist?... Well, the old standard definition, the knowledge, the knowingness is between their two ears. Right in their brain. I guess I call something else, which is like knowledge that you can execute. Knowledge that you can actually go out and implement into the world to make change, or to create something. Or you have to be able to make it effective knowledge that you can execute. And there's still like a little bit of a gap that would exist there. So, I'm saying all this to say that AI is definitely challenging this idea of 'what does it mean to know,' and it's definitely challenging this idea of 'where does knowledge exist?'

Similarly, Peyton emphasized the impact of improper AI use:

> I think that it can also be a hindrance to great scholarship later on. That's what I'm driving at. A hindrance to great scholarship later on. But it could also be hubris and conceit on

my part. It could be that. Because look, here, I am reading, now I am reading a text. And I see a reference, and before I finish the paragraph, I download the references and read them. You know, so when I have to deal with something, I know what I'm talking about.

The study participants also expressed their perceptions on the necessity of a model for AI use which related to this theme of AI as a Barrier to Knowledge Construction, as it investigated professors' apprehensions regarding students' digital literacy, subject-matter knowledge, and skill development while also exploring student motivation and emotional response that they think compel students to employ LLMs as a shortcut for quickly completing coursework. Skyler noted, " I think it's how it's modeled. How it's leveraged. I think that is key." Later, Skyler added:

> … This is an interconnected, increasingly interconnected digital world that we all have to function in. And how to leverage it in an optimal manner, I just think it would help us… And because we don't, the students don't know the proper parameters. I mean, how can you tell a student not to leverage any form of emerging technology, I mean, in the environment that we live and we work in, when it's part of their day-to-day?" He further explained, "…I'm from the school of thought that it's the lack of training and the lack of guidelines. That's been our experience, so we had to adopt that quickly.

Skyler further emphasized:

> It would be nice if scholars, like our future doctor here, for example, have models to not inhibit, but enable students to know how to use it and to reimagine our learning. That's the angle. And that's the approach I think we're going to be forced to deal with once we get the proper guidelines.

Taylor emphasized instructor responsibility, "There's the gap like you have to fill the gap, right? Like you have to teach people what the right thing is, and how to do it. And then, if I teach

you or we teach you and we show you and give you resources, you can't do that anymore…"

Later, Taylor noted:

> I definitely think 85% of it is not from malice or from, you know, wanting to do it. It's just a lack of realizing what we're doing, some of it, because you're from a generation that did use computers, and now you are. And you're like, oh, I didn't know. Some of it's because, like, you just don't have computer literacy.

Morgan expressed concerns about assumptions that students know how to use AI ethically while emphasizing the need for training:

> I kind of feel like right now we are assuming the students know how to ethically use AI. But I do feel like we need to have some sort of training for our students as part of their first year seminar or something. Because I feel like I'm meeting too many students that say I didn't know. They're just taking the prompt, putting it into AI, and then copying and pasting what AI says, instead of doing their research or submitting their own original thoughts with like for a discussion post… People are going to use it. I think it's a great tool, but it to some extent, it could be hindering their learning process.

Jordan stated, "There's no handbook. There's no guide to look at and say, okay, this is how I can ethically use this. And so they're left to their own devices, to experiment and to try and to fail."

Within this theme, the research participants explained that some students respond to the discussion by expressing feelings of guilt, shame, fear, or, in some cases, students react defensively. Additionally, study participants shared their perceptions about the distinguishing factors between graduate and undergraduate responses. Some professors perceived that students

who were detected using AI unethically to complete their coursework were motivated to do so because they feared failure and the repercussions associated with not achieving their educational goals.

Theme 1c: AI Integration to Supplement Traditional Learning. This theme provided insight into faculty-driven strategies for integrating LLMs into course design and assessment, supplementing traditional lectures and coursework to enhance students' knowledge construction. It focuses on scaffolded AI activities and ethically framed assignments that model the responsible use of LLM while leveraging AI to deepen understanding and discourage misuse of the tool. Avery provided his insights on how to enhance learning when AI is integrated ethically:

> So, what you need to do is assign AI assignments. Tell ChatGPT, come up with these five things, present them in class. Now I've got my hands on modality, right? Hey, now I'm teaching a person to teach, and they can actually function in an environment, right? And all they need is to have a lesson plan or be able to follow the guidelines of ChatGPT. It's all you need. You have an AI assignment. Your job is to go on AI and learn and use it greatly.

Jordan shared, "So, if you're talking about if you're talking about instructional feedback, especially the logistics of a classroom…" Later, Jordan added, "The logistics of the classroom, we can really leverage that. The advantage is that we can get to more students, we can cover more assignments, we can do more things." Further emphasizing institutional challenges, Jordan noted:

> Absolutely, a huge amount of training is needed, and it doesn't all have to be formal. It can be organizational learning. It can be informal… Because if we're not at least dipping

> our toes in this particular pool, there's no way we're going to be able to teach our students how to swim in it." And again, "For me, the big barrier is, there's really no training. There's no or very little training or background in how to use AI ethically… And it's fascinating hearing from the students. Because there's a whole lot we don't know what to do with this, right? We've never really considered how much use of AI is cheating versus AI to support my learning… There's no handbook. There's no guide to look at and say, okay, this is how I can ethically use this. And so, they're left to their own devices, to experiment and to try and to fail. And some of the punishments are harsh, to say the least, right?

This theme highlights the role of higher education institutions in providing guidance to shape tasks that uphold academic integrity and build students' digital literacy and critical thinking skills. Within this theme, the research participants described how systematic obstacles, such as a lack of institutional training for students and faculty, and unclear guidelines, prevent deeper student engagement. Morgan shared examples of her institution's practices:

> I do feel like we need to have some sort of training for the students, maybe as their first class, you know, the intro class. Where it could be even a video training with like a few quizzes, you know, quiz questions at the end or something." Additionally, Morgan added, "So, I kind of agree with what Jordan just said. You know, we as professors, we need to be aware of, you know, the capabilities of AI. And also, you know how to incorporate it into the classroom, you know. How it can be used to help facilitate learning not be seen just as a threat. So, we certainly need training on, on how to see it, how to know what it is, you know. We also need to train ourselves on the ethics of using AI in academic settings, right?

Peyton emphasized the potential AI has to support critical thinking:

> You know, it can be used to compare the concept of others as given in Edward Said or Levinas because they both have concepts. They can dig deep in that area, you know. So, I think for education, it would be very, very good. For any field for that matter, you know, but you have to come to it with almost with a sense of awe, you know, that we… I'm getting an opportunity now to learn this.

The participants offered further insightful remarks about AI integration as a tool for providing students with feedback for coursework and enhancing students' learner agency to cultivate their authentic voice, rather than acting as a crutch for knowledge ownership when problematic practices are employed using LLM. Additional comments reinforce the participants' perception that AI can alleviate classroom logistics, hence enhancing professors' existing pedagogical practices.

Skyler shared, "And again, I can't stress this enough. How instructor engages and constructs his or her online course is critical. I think that's the game changer right there." Later, Skyler shared examples of implementing AI to ease institutional logistics and foster learner development:

> I think the best way is… the course plan, how it's constructed. Number two, setting expectations upfront. Number three, modeling it throughout. Encouraging it throughout. Even affirming those that are using it effectively as it's demonstrated. So, to me, that's from the beginning and throughout, but you've got to construct a course a scholarly course that demands a student leverage technology.

And again, Skyler added, “I would tell any scholar to… reimagine their curriculum and make sure that emerging technology is immersed and integrated into their curriculum.”

The research participants perceived that integrating AI into the curriculum as a supplemental learning aid for traditional learning can help students in many ways, enabling them to develop their critical thinking skills and foster a greater understanding of complex concepts.

Theme 1d: AI as Assistive Tools for Students with Learning Disabilities. This theme examined educational strategies for creating and evaluating assignments that support students with learning difficulties, such as dyslexia and neurodivergence, while implementing measures to prevent LLM misuse. It focuses on the assistive abilities of LLM (e.g., varied formats, clear guidance, structured assistance) that enhance student engagement and uphold academic integrity.

Avery described how AI could be a solution to socioeconomic educational disparities by providing equal access to academic resources:

> And I think it brings parity to an overall situation, whereas the, you know, the big Catholic school always had the best athletes and the best students… And then you've got the other school, the public school that lost in the vouchers and now their school is really downhill. So, it's just a matter of socioeconomics. And so, AI is free. You see what I'm saying? It brings parity where there was none.

Morgan emphasized the importance of thoughtful implementation:

And in terms of how AI can help to supplement. There are so many ways, but we have to be careful that we're not abusing it and taking away from our own brain power. You know, if a student has a learning disability, AI may help to organize their thoughts, right?

This theme highlights how AI can support students with diverse learning styles and challenges with reading, writing, or processing when trying to understand difficult concepts. Within this theme, the research participants described the equitable learning opportunities promoted by integrating LLM into learning for students with learning disabilities in low socioeconomic environments. Skyler described how AI can be used as a tool to enhance learning:

> I think students can turn around their productivity which we would want, is better. I have seen, yeah, the productivity is it's much better. I would say right now the students' productivity is much better. And I've seen really good APA adherence which is impressive. And I can honestly say I can see the students writing, I mean, we recruit students who are solid writers, but there's a difference between being a good writer and being a scholarly writer. So, I'm seeing that improve, as well.

Taylor shared AI's ability to support neurodivergent learning needs:

> I think any technology; any assistive technology can be good for anyone who has a learning disability. But I also think any assistive technology can also not be good. It depends on how the person is taught to use it. And if it's helpful for that person, because sometimes there it's not helpful. It can be more of a distraction, it can take away from the learning it depends on, you know, what that person finds helpful as an assistant.

Participants also shared their perceptions about AI's ability to alleviate the cognitive load for students while enhancing their learning opportunities. Jordan said, "…They see it as a powerful tool for… for learning and getting their stuff done and accomplishing something."

Later they added, “AI is good for taking off some of the cognitive load they had as students, right?... It can help me do research. It can help me find sources. It can help if I use it well, right?”

The emphasis for this theme was on AI’s ability to enhance comprehension, reduce cognitive load, and foster equity that can be implemented for students with learning challenges. Participants suggested inclusive AI strategies that strike a balance between accessibility and academic rigor, while upholding ethical standards. The emergent themes for Research Question 2 and participant contributions for Research Question 2 are listed in Table 4.

Table 4

RQ2 Emergent Theme and Participant Contributions

Research Questions	Themes	Participant Contributions	Participants
RQ2. How do online professors describe their ability to create and evaluate course assignments to deter online students from misusing LLM AI tools?	Theme 2a. Perceptions and Pedagogical Integration of AI	9/10	Jordan, Taylor, Casey, Skyler, Morgan, Avery, Drew, Cameron, Peyton
	Theme 2b. AI Training Needs in HEI	9/10	Jordan, Taylor, Casey, Skyler, Morgan, Avery, Drew, Cameron, Peyton
	Theme 2c. Institutional Frameworks for Ethical AI Use	6/10	Jordan, Casey, Skyler, Morgan, Cameron, Peyton

Theme 2a: Perceptions and Pedagogical Integration of AI. This theme explored the perceptions of students and faculty regarding their understanding and misconceptions about the capabilities of large language models. Its emphasis was on the applied pedagogical integration practices of LLM within course design. Cameron shared their thoughts on demonstrating appropriate AI use:

> But if we can learn how students can learn from it and how it can facilitate their learning, and like really go into the classroom and just show them that, like, I don't think there'd be anything wrong with us showing them how to use it. And then that, I think, just helps them, like if they see us pull it up.

Casey explained, “Well, I think that it just goes back to a lot of things that we know about best practice, right? There's even before we get to AI, we still have to remain footed in culturally relevant pedagogy.” Later, Casey added:

> And so, when we go into learning environments and now we're evaluating and incorporating the student's lived experience into the things that we want to teach them about and then we're using language models or AI to help navigate those two things and bridge gaps, I could imagine that could be very exciting for students.

Drew shared ideas about pedagogical integration practices:

> I think we can teach kids to utilize AI. To help them along and teach them how to properly use it as a supplement rather than as a replacement. Because you use it to help you get started or to help you better understand the concept that you don't fully understand.

Drew further explained:

> Then ask AI to explain it to you on the level that you need it to. I mean, you still read it. And you're still engaging with the content. But maybe it makes more sense the way Gemini or ChatGPT said it to you, you know?

Within this theme, the study participants highlighted that LLM can serve to bridge the gap between students' knowledge acquired from their lived experiences and the learning objectives set by higher education institutions, acting in a supportive capacity where traditional human instruction may not adequately facilitate culturally relevant teaching.

Jordan highlighted the instructor's role in enhancing learning through pedagogical integration of AI:

> So, if AI allows my students to access information in a heartbeat. And drill them on it and memorize it, right? That's great that they can do that, but that changes my role as an educator to teaching them how to synthesize, to help them develop from the socialized mind to the self-authoring mind… So that piece of the human development becomes my job as an instructor. That's my challenge, though. My challenge is to stay relevant to those students.

Morgan demonstrated appropriate AI integration:

> I may say, hey put it into AI and let's see if ChatGPT gives you an organized table of contents. So that way, when you write your paper, everything flows more naturally. So, there are times I encourage its use. And that's, you know, to me, ethical use of AI.

Peyton added thoughts on the evolution of AI integration:

> You know, AI has brought us all out of the cave. And we are being assaulted by this brilliant light now. And what the University wants is for some of us to go back into the cave and live in the cave. But AI is saying we need to stay out and get used to the light. And the challenge is how we're going to draw the rest of the University out of the cave into the light, also. The participants in the study shared their perception of AI assistive

capabilities, highlighting its role as a supportive tool that can assist students in developing ideas for initiating research or grasping challenging concepts. Participants also shared their perceptions about the evolving responsibilities of professors as AI is integrated into the curriculum.

Skyler emphasized modeling responsible use:

> … We have to put the emphasis on how to use it and how to use it in the most optimal manner… Model it, show them how to do some of the prompting using scholarly inquiry… Again, it comes down to me, the instructor, how to set the tone of their course… Formulate policy and conduct advocacy in a digital world.

Taylor explained AI literacy as a practical constraint challenging successful integration:

> So, I don't know the equitable way to say or the correct way to say this. But there seems to be a gap sometimes between what people understand plagiarism is at this academic level, and what they probably should know, to be where they are… But there's the gap. Like you have to fill the gap, right? Like you have to teach people what the right thing is, and how to do it.

The participants' comments reinforced their perceptions about AI's enhanced effectiveness when incorporated into higher education learning experiences by emphasizing the importance of meaningful implementation. They highlighted AI's role in facilitating culturally responsive teaching and integration.

Theme 2b: AI Training Needs in HEI. This theme explored the perceptions of student and faculty drivers behind professors' beliefs about AI integration, students' adoption of AI, and

HEIs' ability to model ethical LLM use for students. This theme identified significant deficiencies in digital literacy, subject-matter comprehension, and technical skill sets that lead to misuse. It also identified specific training requirements to support the integration of relevant and ethical AI, based on the participants' perceptions. Avery emphasized the need for instructors to be knowledgeable about AI integration:

> I'm in a gymnasium. I have a kind of an upbeat personality. You kind of have to, you know, you've got all the football players in and out, all the basketball players, you're going to have to be down to earth and approachable. You don't have a choice with all of your subjects. So, if AI is something that they want to talk about, I want my door to be open to that. And I want to be knowledgeable about it when I'm talking.

Drew emphasized training students to integrate AI appropriately:

> And I have shown them in several classes how to properly use it… I showed them I did a whole class where I was doing a lesson plan. This is how we're going to do AI. And I used basketball for an example, and so I went on ChatGPT. Act like a third-grade teacher, I need you to create a lesson plan for this many students for this amount of time with this amount of equipment. And the objective is X, Y, and Z. You have to tell it what your objective is. You have to tell it what you want to get out of it. And they were like, oh, my God, but then they saw how I didn't copy and paste it, how I just took the ideas and then put it in my own lesson plan in a way that makes sense for me.

The study participants shared that it is their perception that AI training is essential for professors and students in HEI to enhance AI incorporation into the curriculum, emphasizing that instructor preparedness directly impacts student engagement with LLM. The participants in the

study discussed their perception that training may fill instructors' knowledge gaps, which could prevent AI integration into the curriculum by professors. Participants also talked about their perceptions that AI training, which models prompt engineering, would add value to training that teaches the students how to create better prompts for AI-generated information used to complete coursework. Jordan highlighted students' deficiencies regarding AI use:

> I took a look at one of the groups. And one of my students was typing away. He said, yeah, I just did a web search. Like, you're not using AI? No, I found what I needed with the web search. And so, my suspicion is, okay, either he didn't think AI was going to give him a good answer or he just wasn't conversant and using these tools. So he's just going to go with the old familiar. But that's an old change management problem, right? If I don't have a compelling reason to have to learn a new function, I'm not going to do it.

Morgan further emphasized the need to train students and instructors:

> … To raise awareness, because I do feel like a lot of these students say they didn't know, and who knows, maybe they really didn't know. Maybe they were just trying to sound naive so that they don't get in trouble and say, I didn't know, right?
>
> … I really do think we, as professors, need training as well on all the different facets, the different layers of how AI can be incorporated into the classroom. I also have seen professors who say I've never used it. So, I do think it's there. It's just it's gonna be just as popular as using Microsoft Office Word to submit your assignments.

Peyton explained:

> Trained myself… My skills developed over time as I was exposed to new ways of doing things. Okay, that's what AI has. AI has given us a new set of skills over time, and we would be nuts not to try and help our students use these skills most effectively, you know.

Additionally, Peyton emphasized that higher education must adapt to AI-enabled scholarship:

> So, I'm saying, now, the university has to understand, okay, we don't use card catalogs anymore, you know. And we don't have these reserved areas where only certain people can get those books anymore. Okay, I can sit at my computer and tell ChatGPT or DeepSeek to bring up some stuff. And I have it right at my hands. Now, my challenge after that is to look at those things carefully, assess its authenticity and see how well it can be used, because the thing about it as scholarship gets more refined, the question is not what you're going to include, but what will you exclude? Okay, because there's so much more information that AI is bringing you. Now you can't include everything, okay. So your scholarship now is not going to how many pages or references you have, but how well you use what you have been given, you know. So that's all.

Peyton also emphasized:

> Understand what I'm talking about. You see, we have to, we have to expand. You know, we have to expand ourselves. Look, we all, based on our years and our scholarship, we all know a drop, but there's the ocean out there, you know. And now our students don't have to just pull from the drop that we have. They can go to the ocean themselves.

Skyler noted the importance of scholarly AI usage:

> It's a graduate school. And so the students have to be quite honest, they have to know how to master optimizing all forms of technology as appropriate… Affirming those that

are using it effectively as it's demonstrated. So, to me, that's from the beginning and throughout, but you've got to construct a scholarly course that demands a student leverage technology.

The participants' comments reinforce their perceptions that AI is a transformative technology skill, analogous to previously adopted technologies, underscoring the importance of AI training that teaches students to critically evaluate and curate AI-sourced information, which will be used as a resource to support learning in HEIs.

Theme 2c: Course Design and Evaluation to Deter AI Cheating in HEI. This theme did not present itself as directly in the analysis of the one-on-one interviews, but it garnered such a broad discussion during the focus group discussion that it warranted being highlighted as a theme related to research question two. This theme highlighted the participants' perceptions that HEIs are moving beyond students' use of AI for cheating to creating assignments that enable students to leverage AI for gaining knowledge, while introducing improved evaluation strategies. The participants discussed the need to overcome professorial inertia in coursework to reimagine outdated course assignments and activities, aiming to deter students from online cheating in the age of AI, as they apply new information in coursework now and in the future. The study participants shared that they perceive the degree to which AI-integrated assignments have enhanced students' knowledge about a subject can be evaluated through oral exams as an effective strategy to assess students' conceptual understanding, allowing them to articulate and own their constructed knowledge verbally. Casey recommended strategies to deter AI misuse:

> And so what I love about this is that there's something that I call your walk-around knowledge. You know that by which you can go anywhere and show up. And it's the knowledge that you maintain within yourself, within the expertise that you say that you're

interested in. And so sometimes the student will turn in a paper. In our case, how it works, you turn in a paper, and sometimes the paper is just so strong that the orals are just a pleasant conversation. And then sometimes the paper it's just okay, or you know, it's not that strong. But you still know that through the oral, the student now has a chance to illustrate what it is that they know, and maybe fill in some gaps that may be there in the paper.

… It would be perfectly fine for them to use AI to boost 30% of their knowledge and help their writing when they come in, and they take ownership for that. In the case of the oral examinations and the final product.

Cameron advocated rethinking outdated assumptions about AI's role in learning:

You guys think like, Peyton said, like the facts are out there. And I was even like kind of having this thought like, ever since I've been in public high school. When I've had to do assignments, I've had Google. I've had Ask Jeeves, Yahoo, you know, like the iterations of the search engines. And AI is essentially just a more advanced search engine. And so, I think it really is learning how to work with it, and us having asked better questions because I would imagine the same thing happened when search engines came about.

Furthermore, Cameron added:

> So, I think it's like just shifting that perspective. And like even having like these conversations with people with different perspectives, to really appreciate, maybe, how others are using it or seeing it and already reimagining some of their assignments.

Providing further emphasis, Cameron added:

> … And so, I think that it is like maybe someone said, like was speaking to the laziness of professors, like we get stuck in our ways, right? It's like we have our assignments figured out, like that takes a long time to get those things figured out. So, no one really wants to have to redo all of that. But at the end of the day, if we know AI is not going anywhere, like not only do we need to help our students ask better questions, but we have to actually get at it. Do you know what to do with this truth? And when you're out there in the world, can you apply it to these different circumstances?

Participants also discussed their perceptions of the importance of allowing students to demonstrate knowledge linkages for AI-generated information used in coursework, employing a two-step approach. This approach involves the student conducting research using AI as the first step, followed by answering questions posed by the professor to ensure comprehension as the second step. The study participants expressed their support for introducing assignment evaluations that require students to explain the process they followed when using AI and include proper citations.

Peyton noted, “It reinforces the laziness of the people with tenure, that they don't want to do it. It's just reinforcing their own stuff, reinforcing their qualifications, and highlighting their incompetence.” Later, Peyton recommended assessment strategies to assess students’ authentic understanding:

> But that's just the 1st step. So, what I'm proposing is that after they've brought their AI research to me, I sit them down, and I question, now you tell me what you said about this. What do you mean by that? How do I know that they understand the information that they bring? Which is what I'm trying to get at? So, okay, I assume that you go and look at the linkages between the upper limit learnings and the Peter principle. Okay, this is what

that says. Now, what does it mean to you? You know how. How do you understand this statement that you have written here? How do you want me to understand that? You know? Now, if they cannot explain that. That's where the grade comes in.

Jordan addressed innovative assignment design:

The creation of the assignments, right? The evaluation is still the same. And to Peyton's point, I'm looking at saying, how are you using this? And to Casey's point as well, right? Are you using this as you know? How are you practicing? How are you using this? How are you applying this? …Are really the kind of evaluations that I'm making.

… Figure out how to use AI, and then but the conditions are that you come back to me and tell me, what did you do? And then cite your resources and your sources. Don't give me an AI answer without citing it properly, and AMA and APA and these other folks have given us permission. They've given us the proper way to cite AI.

Skyler advocated reframing institutional assumptions about AI's role in learning in higher education:

I think AI is challenging our assumptions… It's challenging our own mental models. And to be quite honest, our outdated mental models. I think again we allow it to challenge our outdated assumptions and to frame them accordingly. I believe we need to explore the literature and see how best practices around AI are occurring, and really stretch our own models around it to develop new ways of thinking beyond. Because I'm for the guidelines. I'm for not cheating… I just don't think we can stop at cheating and guidelines. I think that's one level. I do just think we have to go further.

The participants' comments reinforce their perceptions that AI is challenging the traditional mental models of HEIs to stretch institutional frameworks, and the importance of rethinking outdated assumptions about LLMs when creating assignments that deter cheating using AI in HEIs to develop new ways of teaching and learning.

Evaluation of the Findings

Research Question 1: What are online professors' experiences with student use of LLM AI tools in higher education institutions' online courses, and their perspectives on the ethical implications of designing assignments without proper guidelines for AI integration?

The findings underscore that AI is a powerful tool to improve academic outcomes by enhancing learning experiences, critical thinking, problem-solving, students' efficiency, and knowledge acquisition when it is ethically integrated into coursework. Conversely, in examining the phenomenon, the research findings highlighted concerns about AI misuse when it is incorporated into HEI, potentially resulting in ethical challenges, such as LLM overreliance that could result in plagiarism, misinformation, diminished cognitive skills, shallow learning, and threaten academic integrity (Bayly-Castaneda et al., 2024; Garcia- López et al., 2025; Mohebi, 2024; Williams, 2024). It also emphasized the need for student and faculty training, which aligns with Funa and Gabay (2025), who found that training and support issues are additional challenges for successful AI integration in education, along with issues related to technical, ethical, fairness, cost, accessibility, transparency, privacy, and educational goals that are misaligned. Williams (2024) highlighted the threat that AI-generated content can pose to academic integrity, noting strategies to address related ethical challenges, which echoed the sentiments of the study participants' perspectives.

Jensen and Jensen (2025) found that the guidance provided by HEI regarding the use of Generative AI (GenAI) in academic writing was not aligned with students' experiences. The research advocates for AI literacy that is academically relevant for students and highlights how imagined capabilities influence GenAI interactions during writing. A critical concern that emerged during the study was the lack of AI literacy among students when interacting with LLMs. This reinforced concerns that the tool could become a barrier to knowledge construction when AI is misused, highlighting participants' perceptions of gaps in students' understanding of how to engage with AI meaningfully and the resulting weak content mastery. It highlighted the importance of establishing guidelines on AI use and constructive feedback loops when interacting with the tool in writing and other student experiential learning tasks. The research revealed that LLM is a supplementary tool for higher education when it is integrated ethically. The data revealed the participants' mixed views on which specific tasks would garner the greatest value for learning through the applied pedagogical integration of AI in coursework. Nonetheless, there was considerable support from the participants for scaffolded and ethically framed AI tasks that can enhance learning (Quian, 2025). The findings highlight the assistive benefits of LLM in fostering deeper learning, inclusion, and support for diverse learning styles, thereby aiding students who are neurodivergent, dyslexic, or have other learning disabilities (Deckker & Sumanasekara, 2025; Smith, P., & Smith, L., 2021). There is a major gap in peer-reviewed research related to neurodivergent, dyslexic, or other learning disabilities. Although a few studies addressed personalized learning for neurodivergent students, the research was limited in examining GenAI tools, such as LLMs, integrated into HEI coursework, institutional practices, guidelines, or the evaluation of implementation to support students who are neurodivergent, dyslexic, or have other learning disabilities. There is a clear gap in the literature that presents an

opportunity for future research to address structured, curriculum-driven LLM integration for students with learning disabilities.

The research findings also showed consistency with other emerging trends of AI in higher education research, such as ethical challenges, academic integrity concerns, digital illiteracy, the need for guidelines to govern AI usage, better prompt engineering guidance, student and faculty training needs, and revised assignment and assessment design that aligns with AI implementation (Bittle & El-Gayar, 2025; Patil & Gudivada, 2024; Qian, 2025). These findings are relevant to the scope of RQ1 and tightly align with the previously stated purpose of the study.

Research Question 2: How do online professors describe their ability to create and evaluate course assignments to deter online students from misusing LLM AI tools?

The findings revealed that AI is a powerful tool for enhancing learning outcomes in higher education, highlighting that LLMs can play a role in facilitating culturally responsive teaching while expanding professors' roles through the thoughtful implementation of ethical AI in coursework. Additionally, the data highlighted the significance of integrating AI into the curriculum, illustrating how it aligns with a constructivist learning approach driven by technology to make learning deeper and more meaningful by connecting new course material to students' prior knowledge (Alkhabra, 2022). Still, the findings indicate that professors have concerns about students' digital literacy, knowledge, skill set, and misuse of tools. The data further highlighted professors' concerns that, in instances where students lack guidance from a subject matter expert to help them understand how to properly implement AI tools and develop appropriate prompts for research information, it results in plagiarism and has the potential to become a hindrance to scholarship. Consistent with the research findings, Lee and Plamer (2025)

found that it is important to teach meaningful prompt engineering that aligns with contextual educational goals.

The study findings also revealed an urgent need for ethical AI integration training for professors and students. Current research underscores these findings, showing that most instructors do not have comprehensive training in prompt engineering, AI-integrated pedagogy, and generative AI best practices to ensure research quality in HEI (Baytas & Reudiger, 2025). The research findings also indicate that the innovative course design and evaluation should be implemented as a deterrent to AI misuse.

It further highlighted that students' authentic understanding should be assessed, pointing out that this can be done using strategies such as oral exams. Gray et al. (2025) support these findings, advancing the theoretical argument for a fundamental pedagogical shift toward validity-driven assessment practices in the current AI-saturated era, which can deter cheating. Gallent-Torres et al. (2025) posit that integrating GAI into HEI coursework will require clear guidelines that align with HEI ethical codes and academic integrity policies to be established. Research shows that some HEIs are moving toward oral assessments as an effective evaluation strategy (Mariano et al., 2024). However, a gap remains in empirical research on designing AI tasks or fair assessments to evaluate the effectiveness of alternative assessment formats in deterring unethical use.

Deterrence theory served as an effective theoretical framework for this study, as it provided a theoretical foundation for exploring professors' perceptions regarding assignments and assessments designed to deter students from engaging in the misuse of LLMs or unethical behavior that violates academic integrity policies in online courses, particularly when using AI tools to complete assignments. The theory's central tenets of certainty, severity, and swiftness of

punishment were relevant to the context of online education and guided research decisions related to the study's research questions and data gathering procedures used for analyzing how professors attempt to deter unethical AI use among students in HEI (Siponen et al., 2022). Deterrence theory was aligned with the study findings as it related to participants emphasis on the importance of certainty of punishment when using detection software or other forensic techniques for uncovering AI misuse, severity of punishment when enacting academic penalties such as course failure, expulsion, or other disciplinary actions critical to preventing unethical AI usage over swiftness of punishment in deterring students from violating academic integrity in online courses (Kumar et al., 2019). Deterrence theory also aligned with the professors' shared perception that students either did not think that using AI was unethical or that they would get caught, thereby establishing the need for guidelines and training to support the learning objectives of assignments designed to deter students from cheating using AI tools.

As a result of the convergent findings within themes that emerged for both research questions related to the ethical implications of AI misuse, an emergent framework titled the Ethical and Inclusive AI Integration Model (EIAIM) is proposed. The list of emergent themes is provided in Tables 3 and 4. EIAIM reflects the perceptions shared by professors during the study and aligns with deterrence theory to provide structured guidance that supports the ethical use of AI, discourages the misuse of LLM tools, and scaffolds student learning. The full conceptual framework, along with its implications for HEI, is provided in Chapter 5.

Summary

In this chapter, I present my findings on the perspectives of professors regarding the utilization of LLM AI tools by students in the context of completing online coursework in higher education institutions, based on their experiences teaching online courses in the USA. This

qualitative exploratory case study's findings focus on concerns about academic integrity policy violations and further implications of AI tool misuse becoming a barrier to knowledge construction, student agency, and critical thinking. Employing Braun and Clarke's six-phase thematic analysis, I identified themes related to what constitutes ethical AI use in coursework, underscoring the need for institutional guidelines for integrating AI. The themes that were identified for the two research questions that guided the research are: (a) Ethical Implications of AI in HEI, (b) AI as a Barrier to Knowledge Construction, (c) AI Integration to Supplement Traditional Learning, (d) AI as an Assistive Tool for Students with Learning Disabilities, (e) Perceptions and Pedagogical Integration of AI, (f) AI Training Needs in HEI, and (g) Institutional Frameworks for Ethical AI Use. The data used to identify the themes that emerged were collected through one-on-one interviews and a focus group. I present examples of rich narratives collected from the ten professors who participated in the research study in this chapter. I substantiated the finding by presenting how frequently the participants' narratives upheld the themes. The findings reinforced that certainty of detection is perceived as more effective than the swiftness of punishment. I confirmed that these findings align with deterrence theory's assertion that perceived risk deters unethical behavior.

Chapter 5 will present the implications of the study's findings, demonstrating that LLM can expand professors' roles through the integration of ethical AI in coursework. It will also encompass professors' concerns regarding students' lack of guidance from a subject matter expert when using AI to complete coursework. This will further substantiate the urgent need for ethical AI integration training for professors and students, as well as the necessity for clear guidelines. Chapter 5 presents the EIAIM model, derived from the study findings, which

integrates the themes identified from participant data and provides a practical response to the inquiries outlined in RQ1 and RQ2.

Chapter 5: Implications, Recommendations, and Conclusions

The problem addressed in this study was online professors at urban, 4-year degree-granting institutions experience students using LLM AI tools to misuse or engage in unethical behavior, a situation exacerbated by the 186% increase in distance education enrollment since the onset of the COVID-19 pandemic (Mhlanga, 2023; Parnell, 2022). The purpose of this qualitative exploratory case study was to investigate online professors' experiences with students' use of LLM AI tools and their perceptions of how course assignments can be created and evaluated to deter cheating at urban, 4-year degree-granting institutions in the United States.

This qualitative exploratory case study demonstrated that when supported by explicit ethical guidelines, structured assignment design, and digital literacy training, strategically integrated LLM AI tools could transform AI in higher education institutions from a potential threat to academic integrity into a tool that can enhance knowledge construction, promote equitable access, and improve instructor and student AI engagement in higher education. Grounded in deterrence theory, assignments that promote the ethical use of AI while deterring misuse, enhancing credibility, and promoting relevant learning in AI-transformed higher education environments could be designed at HEIs.

A qualitative exploratory case study design was chosen for its capacity to illuminate the authentic experiences of professors within the emergent phenomena of LLM AI tools in higher education. Rosen (2019) emphasized that emerging areas of research necessitate a method that offers flexibility in qualitative research conduct while maintaining research rigor. Semi-structured one-on-one interviews with 11 online professors and a follow-up focus group were conducted using Zoom. The data were transcribed and analyzed thematically, following Braun and Clarke (2016). One participant's data was excluded during analysis because they did not

meet the inclusion criteria, which helped maintain methodological coherence and trustworthiness (Flick, 2025). Data saturation was achieved through careful participant engagement.

This chapter begins with a discussion of the implications of the findings, anchoring them in theory and current research. Next, it introduces the Ethical and Inclusive AI Integration Model (EIAIM), which is a conceptual contribution derived from the data. It then offers recommendations for higher education institutions, policymakers, and future research. The chapter ends with key conclusions and a reaffirmation of the study's contribution to the body of knowledge, academic discourse, and institutional practices.

Implications

Large Learning Models (LLMs) AI tools have emerged as powerful technological tools with the potential to significantly transform learning outcomes, improve student engagement, and positively impact retention rates in higher education. Early research suggests that AI technology can be utilized to enhance student engagement, support academic writing experiences, improve personalized learning, and facilitate immediate feedback loops. Seaba (2023) advocated for AI-enabled brain-based learning to enhance cognitive development, improve student engagement, and knowledge retention, for example. Additionally, insights into the potential benefits of incorporating generative AI in education as a tool to enhance learning, teaching, and pedagogical advancements, as presented by Correia et al. (2025), contributed to the advancement of academic discourse on AI-enhanced learning with ethical guidelines. Research indicates that incorporating LLMs, such as ChatGPT, into AI-integrated education environments offers additional benefits for teaching support, task automation, and professional development (Crompton & Burke, 2024).

Current research highlights that the benefits of integrating AI in education are not guaranteed due to lagging advancements in ethical guidelines, institutional policies, and course design, as well as the challenges associated with LLM AI tools (Lo, 2023). This is a key concern that needs to be addressed. This qualitative exploratory case study aimed to address key questions regarding the ethical concerns discussed in the current literature and how course assignments could be developed to prevent AI misuse. Implications drawn from the research findings of this study contribute to the body of knowledge by providing recommendations for policy, theory, practice, and future research.

Participant data were analyzed and interpreted in Chapter 4. The findings presented in that chapter align with research questions one and two to reveal that strategically integrating LLM tools that are underpinned by clear ethical guidelines, scaffolded assignment design, and digital learning training for ethical LLM AI usage can potentially shift AI from a threat to academic integrity to become a mechanism that deepens knowledge construction, promotes equitable access, and empower instructors and students in higher education. The findings of this study further demonstrated that institutions should align AI integration when designing assignments with deterrence theory practices to promote ethical AI utilization while deterring misuse. This reinforced the credibility and trustworthiness of the study findings, which promote learning by strategically integrating LLM AI tools for knowledge construction in higher education.

Although the current academic discourse on the potential benefits of LLM AI tools in education is rapidly increasing, there is limited research exploring how online professors who experience AI misuse can deter unethical use through strategic course design, especially within

diverse, urban higher education institution contexts. Table 5 presents the implications of this study, organized by each research question, based on the findings.

Table 5

Implications

Research Question	Implications
RQ1: What are online professors' experiences with student use of LLM AI tools in HEI online courses, and their perspectives on the ethical implications of designing assignments without proper guidelines for AI integration?	A. Professors' uncertainty about how to address AI use due to the absence of AI-integrated policies or unclear ethical boundaries and policies that foster ethical ambiguity. B. Barriers exist for students to have meaningful experiences with the course assignments due to the students' misuse of LLMs. C. The use of AI is avoided and not thoughtfully integrated into the curriculum by professors and curriculum designers. D. There is a lack of policies acknowledging the learning needs of students with learning disabilities.
RQ2: How do online professors describe their ability to create and evaluate course assignments to deter online students from misusing LLM AI tools?	E. Increasing certainty of detection by implementing deterrent-based strategies deters misuse more than the severity of the penalty. F. Faculty and student digital literacy training that aligns with ethical AI use policy is needed to promote ethical AI integration. G. Embedding ethics into assignment design while adhering to institutional policies that promote AI ethics training and clarity in assignment expectations supports deterrence theory.

Research Question 1

Implication A. The first implication is that professors lack clear guidance on how to address AI use because HEIs have unclear ethical boundaries or due to the absence of AI-integrated policies, which fosters ethical ambiguity. The study findings reveal that professors are facing increasing uncertainty and frustration about the ethical implications of student use of LLM AI tools, particularly in cases where course assignments were not originally designed with AI integration. Study participants described how generative AI (GenAI) blurred the boundaries between acceptable support and dishonest authorship when utilizing AI tools, leaving instructors without clear institutional guidance. The absence of AI-integrated policy and assignment design created conditions that fostered ethical ambiguity, making it more likely for students to unintentionally misuse LLMs.

In alignment with Theme 1a – Ethical Implications of AI in HEI, from the perspective of deterrence theory, this suggests that the perceived certainty and severity of consequences, two core constructs that discourage misconduct, have not been established. Without embedding ethical parameters into the development of course assignments, professors leave students to interpret their moral boundaries, which can result in unintentional or opportunistic academic integrity violations. These findings suggest that the ethical use of AI in higher education should be aligned with assignment design and instructional clarity. Instructors and institutional policies should address the intersection of these directly to uphold academic standards and promote ethical use of emerging technology.

Implication B. The second implication highlights that the lack of institutional ethical guidelines, coupled with unclear instructional design and ethical parameters for acceptable AI use, creates barriers to students' ability to engage meaningfully with course objectives.

Participants shared their views on this RQ1 finding, which suggests that the instructional breakdown in the absence of institutional ethical guidelines related to course design acts as a barrier to knowledge construction. The professors who participated in this study consistently reported that they were unsure whether their institutions had provided clear or actionable frameworks for integrating ethical AI, leaving instructors to interpret or create their own policies. The lack of top-down guidance led to inconsistent application of AI usage policies across courses, contributing to student confusion and instructor frustration.

In alignment with Theme 1b – AI as a Barrier to Knowledge Construction, it reinforces that AI-integrated assignments accompanied by clear, institutionally supported policies should be developed. When students do not understand the role of AI in their assignments, it jeopardizes their ability to engage in authentic, higher-order learning tasks. In turn, it creates a learning environment that is reactive rather than proactive, it increases the likelihood of AI misuse, and it reduces the instructional value of course design. These findings suggest that higher education institutions should establish ethical AI policies and ensure that the policies are deeply integrated into the assignment development process and institutional communication rather than implementing blanket bans on AI.

Implication C. The next implication is that the use of AI is avoided and not thoughtfully integrated into the curriculum by professors and curriculum designers. The study findings reveal that AI tools should be viewed as a transformative tool that can supplement traditional pedagogical learning strategies, rather than as a threat to academic integrity in higher education. Participants perceived avoiding or banning AI use as counterproductive practices, resulting in increased student curiosity, covert misuse, and missed opportunities for authentic engagement.

In alignment with Theme 1c – AI Integration to Supplement Traditional Learning, professors emphasize the importance of reframing AI from a threat to a pedagogical resource. This is critical to the virtual learning environment in online courses where students rely heavily on digital tools for engagement, support, and knowledge construction. These findings underscore that AI integration should be viewed as a central component of instructional planning, aligning with course learning objectives and promoting transparency around ethical usage, rather than being seen as a peripheral add-on.

Implication D. The final implication for research question one is that the absence of policies acknowledging the learning needs of students with learning disabilities, such as neurodivergence and other cognitive challenges, reveals a gap in inclusive AI support. This study highlights a gap in inclusive AI policy assistance for students with learning disabilities. Study participants acknowledged that LLM tools have the potential to serve as transformative assistive technologies for students with learning challenges, yet no policies or institutional support currently exist to guide or promote the use of AI LLM to provide assistive support for students who have neurodivergence (e.g., ADHD, dyslexia, autism) and other learning disabilities. Despite the emergence of early empirical investigations into the use of GenAI by disabled students, studies remain limited in scope and are not yet relevant to the K-12 education context. Current research lacks a comprehensive exploration of how neurodivergent students in higher education use LLMs pertaining to course design, learning outcomes, and academic integrity in current research. Future instructional policy and frameworks that support effective teaching and learning across diverse academic populations were revealed as a gap in the study.

In alignment with Theme 1d – AI as Assistive Tools for Students with Learning Disabilities, a critical issue of equity, access, and inclusion is revealed. HEIs limit opportunities

for differentiated instruction and inclusive education inadvertently by failing to acknowledge the role of AI in enhancing accessibility. These findings indicate a need for AI-integrated course design that adheres to universal design for learning (UDL) principles and incorporates accommodations to ensure equitable access for all students, particularly those with cognitive disabilities.

Research Question 2

Implication E. The first of three implications for Research Question Two is that increasing the certainty of detection by implementing deterrent-based strategies deters misuse more effectively than the severity of the penalty. The professors described a range of course design and evaluation strategies aimed at deterring unethical use of AI. Oral defenses, scaffolded assignments with required AI usage declarations, the integration of AI detection with revision checkpoints, and other transparency-driven assessment practices were suggested by study participants as strategies to enable students to fully utilize LLM tools while professors assess their knowledge area competency.

The implication aligns with Theme 2a – Perceptions and Pedagogical Integration of AI. Furthermore, from a deterrence theory lens, these strategies increase the perceived certainty of being caught more effectively than imposing severe penalties. Study participants indicated that students were more likely to behave ethically when they knew their usage would be reviewed, discussed, or presented in class. Moreover, by emphasizing that designing AI tasks or fair assessments for transparency and engagement can be more impactful than relying solely on punitive measures, this finding expands the existing application of deterrence theory from its traditionally used criminal justice context to higher education. This implication indicates that institutions and instructors' assignment evaluation practices should evolve to reflect an AI-

integrated instructional environment that emphasizes student accountability, instructor oversight, ethical transparency, and iterative feedback to enhance ethical student behavior.

Implication F. Faculty and student digital literacy training that aligns with ethical AI use policy is needed to promote ethical AI integration, which is the second theme of research question two. Study participants discussed their methods for detecting AI-generated content and their concerns regarding students' digital literacy, knowledge, skill set, and misuse of LLMs. Likewise, professors reported that they need support to update their own pedagogical practices in response to emerging AI tools. This key finding indicates the urgent need for LLM AI-centered digital literacy training for instructors and students that aligns with ethical AI policies in HEI.

This implication aligns with Theme 2b – AI Training Needs in HEI, supporting the EIAIM's input principle of the new conceptual framework that emerged from this research. The new framework emerged with an emphasis on AI training as a foundational condition for the ethical implementation of AI in higher education. Without proper digital literacy and training, AI integration can become a technical and ethical risk that compromises instructional advancement. Therefore, this finding suggests that institutions should prioritize incorporating LLM AI-centered digital literacy training into ongoing professional development, student orientation training workshops, and clear communication of ethical LLM standards across all courses and departments.

Implication G. The final implication is embedding ethics into assignment design while adhering to institutional policies that promote AI ethics training and clarity in assignment expectations supports deterrence theory. It increases the perceived certainty of ethical boundaries. This type of course design protocol deters AI tool misuse while making them

accessible to all students, including those with diverse learning needs, through guided and improved digital literacy skills to engage with LLM responsibly.

This finding aligns with the final theme for Research Question 2, Theme 2c – Course Design and Evaluation to Deter AI Cheating in Higher Education Institutions. It highlights the benefit of embedding ethics into assignment design as it ensures that expectations are clear. This aligns with deterrence theory principles by establishing clear rules that are well-known. Evaluation practices should be strengthened through institutional policies that support instructors by developing their skills through training that promotes the ethical use of AI. This finding presents an unexpected opportunity to incorporate a structured, ethical, and inclusive institutional model, such as EIAIM, which can guide the development of institutional policies and training that are inclusive, accessible, and equitable for all students, aligning with current research.

The Ethical and Inclusive Artificial Intelligence Model is developed based on the findings of this study and grounded in deterrence theory. Ronksley-Pavia et al. (2025) conducted a scoping literature review of GenAI in neurodivergent students. It resulted in the researchers declaring the need for more robust research with a recommendation to develop and apply theoretical frameworks to further research on how AI may be leveraged for neurodivergent learners in an inclusive manner. EIAIM offers a structured approach for educators to integrate LLM in online courses in a way that enhances learning while deterring misuse. EIAIM reinforces the perceived certainty and severity of consequences through transparent ethical design and accountability measures while supporting constructivist learning. It encourages active engagement with AI tools to deepen understanding rather than promote unethical AI use. Many scholars and institutions have developed frameworks related to AI competency. However, none have a scope that directly addresses assignment design and instructional deterrence strategies.

Consequently, the frameworks do not address the diverse needs of students with neurodivergence or other learning challenges in higher education in the context of LLM tool use.

Recommendation for Practice

This study revealed that assignment design and institutional policies can deter academic misconduct while using AI to complete assignments in higher education institutions. Furthermore, the findings underscore that structured training for instructors and students, clear policy guidance, and inclusive practices that support diverse learners, including those with neurodivergent requirements, point toward a comprehensive approach to deter misuse and promote responsible adoption of AI, equity, and academic integrity, which is rooted in deterrence theory. The strategic integration of LLM AI tools can significantly transform learning outcomes, improve student engagement, and positively impact retention rates in higher education. The Ethical and Inclusive Artificial Intelligence Model recommended in this study addresses these needs, providing a practical framework for higher education institutions to use as a guide for adopting and adapting as needed when integrating LLM AI into their coursework. Table 6 shows the implications of the findings and an overview of the recommendations for practice.

Table 6

Recommendations for Practice

Implications	Recommendations
A. Professors' uncertainty about how to address AI use due to unclear ethical boundaries and policies that foster ethical ambiguity.	1. The Provost's Office and faculty should have shared governance to develop a clear policy for ethical and responsible AI use in the classroom.

B. Lack of institutional ethical guidelines linked to clear instructional design with ethical parameters for acceptable AI use creates barriers to students' ability to engage meaningfully with course objectives.	2. Teaching and Learning Centers, and faculty should develop AI-enhanced course design templates that provide clear instructional design guidelines with clear parameters for AI use in assignments.
C. AI should be thoughtfully integrated into the curriculum, not avoided, to supplement rather than disrupt learning outcomes.	3. Teaching and Learning Centers and instructors in higher education institutions should build coursework that integrates AI into assignments for discussion boards and collaborative projects.
D. The absence of policies acknowledging the learning needs of students with learning disabilities such as neurodivergence, dyslexia, and other cognitive challenges reveals a gap in inclusive AI support.	4. The Provost's office and the Accessibility/ADA office should include AI tools in accessibility services, such as recognized assistive technology like screen readers or detection software.
E. Increasing certainty of detection by implementing deterrent-based strategies deters misuse more than the severity of the penalty.	5. Instructors and Teaching and Learning Centers should align modeling responsible AI use with institutional policies related to plagiarism and ethical practices to prevent AI misuse.
F. Faculty and student digital literacy training that aligns with ethical AI use policy is needed to promote ethical AI integration.	6. The Teaching and Learning Centers should integrate LLM AI literacy into core curriculum courses and faculty professional development.
G. Embedding ethics into assignment design while adhering to institutional policies that promote AI ethics training and clarity in assignment expectations supports deterrence.	7. The Teaching and Learning Centers and instructors should embed ethics into assignment design that emphasizes balance when leveraging AI for coursework.

Recommendation 1 Based on Implication A

Provosts and faculty should establish a clear AI policy to guide the use of AI in coursework, thereby reducing professors' uncertainty about how to address students' use of LLMs. It will establish a transparent policy through shared governance that can gain buy-in from faculty, administrators, and students. It can also help ensure that expectations are applied for

coursework across the institution. A transparent policy for the ethical and responsible use of AI in the classroom can reduce student confusion while increasing their confidence in using AI responsibly. Thus, it deters unintentional AI misuse. This alignment with deterrence theory demonstrates that a clearly defined policy may also strengthen the perception of certainty and severity of consequences while making ethical boundaries more enforceable. This recommendation reflects the ethical and institutional alignment component of EIAIM.

Recommendation 2 Based on Implication B

Course designers should develop AI-enhanced course design templates that provide clear guidelines for embedding ethical use with well-defined parameters into assignments, thereby increasing students' ability to engage meaningfully with coursework. Providing instructors with ready-to-use templates will save time and ensure that students have consistent messaging about AI use across their courses; therefore, inclusiveness is promoted when courses are designed with accessibility considerations from the beginning. Consequently, templates can also prevent AI misuse disruptions while safeguarding course objectives by reducing ambiguity and clarifying expectations. This recommendation reflects the course design and accessibility components of EIAIM.

Recommendation 3 Based on Implication C

Professors in higher education institutions should build coursework that integrates AI into assignments to help students develop their authentic scholarly voices while leveraging technology. Therefore, LLM tools can be used to supplement rather than disrupt learning outcomes. Working collaboratively on projects and discussion boards are examples that normalize AI usage, which can position LLMs to become a supplement rather than a barrier to learning. The critical role of professors modeling ethical AI usage demonstrates effective

prompting, ethical usage, and responsible engagement with AI. Furthermore, thoughtfully integrating AI into assignments can help shift higher education online courses to an environment that promotes ethical modeling, critical thinking, students' ownership of knowledge, academic integrity, and authentic knowledge construction. This recommendation reflects the course design and instructor modeling components of EIAIM.

Recommendation 4 Based on Implication D

The Provost and the Accessibility/ADA office at higher education institutions should formally recognize AI tools as assistive technologies that are comparable to screen readers or assistive writing tools. Universities should incorporate strategies to reduce barriers for underrepresented learners by aligning accessibility with ADA compliance standards, providing students with learning disabilities (such as neurodivergence, dyslexia, and ADHD) with equitable access to AI as an assistive technology. Universities should provide free or low-cost options for students to access vetted LLM AI tools through learning management systems (LMS), libraries, and writing centers, thereby mitigating any financial constraints that might hinder access. With features such as text-to-speech, customizable interfaces, and adaptive learning pathways, AI integration strategies can be designed to support diverse cognitive styles. AI tools can help reduce cognitive load without replacing authentic scholarly effort. This recommendation addresses a gap in current research and reflects the accessibility component of EIAIM.

Recommendation 5 Based on Implication E

Instructors, with the support of Teaching and Learning Centers, should align modeling responsible AI use with institutional policies related to plagiarism and ethical practices to prevent AI misuse. Deterrence theory strongly suggests that AI misuse is more likely to be

prevented by modeling ethical behavior, rather than relying solely on introducing punitive strategies. By increasing the certainty of detection and integrating responsible practices into their assignments, higher education institutions can reduce the misuse of opportunistic AI. This approach will enhance faculty support in enforcing policies with consistent institutional guidelines. It will also provide guidance to students about plagiarism and academic integrity boundaries. This recommendation reflects the deterrence of misuse and instructor modeling components of EIAIM.

Recommendation 6 Based on Implication F

Higher Education Institutions' Teaching and Learning Centers should integrate LLM AI literacy into core curriculum courses and instructor professional development. AI training should be a foundational condition for the ethical implementation of AI, prioritizing ongoing student workshops, professional development, and clear communication regarding ethical AI standards across the institution. Instructors can gain confidence in using AI and pass that confidence on to students. Comprehensive digital literacy training programs should be implemented for students and instructors. LLM tool literacy should be a foundational skill that is developed in higher education. Universities should develop orientation sessions for freshman and transfer students on LLM AI ethics, digital literacy, and academic integrity while using AI. Instructors should undergo ongoing professional development to stay current with emerging AI tools and effective teaching strategies. A digital certification literacy program should be developed for students to complete prior to graduation from online degree programs. This recommendation reflects the ethical alignment and instructional integration components of EIAIM.

Recommendation 7 Based on Implication G

Higher education institutions should develop responsive, ethical LLM AI instructional protocols. Instructors should be trained to embed ethics into assignment design, emphasizing balance when leveraging AI for coursework. AI-integrated assignments should promote ethical engagement. Assignments should include checkpoints to increase the certainty of detection as a reinforcement strategy for academic integrity. Students should be taught to submit an AI usage statement and appropriate APA citations when LLM tools are used to complete assignments. This recommendation reflects the ethical alignment and instructional integration components of EIAIM.

Recommendations for Future Research

This qualitative exploratory case study provided new insights into how professors in higher education institutions teaching online courses experience and perceive their ability to design and evaluate course assignments that deter students from using LLM AI tools unethically at urban 4-year degree-granting institutions in the United States. These findings contribute to the emerging literature on AI in higher education, highlighting gaps that warrant further exploration.

To address these gaps, future research should explore alternative methodologies that build upon these findings and provide a deeper understanding of the identified themes. Table 7 outlines recommendations for future research, including quantitative quasi-experimental, qualitative phenomenological, and mixed-methods sequential explanatory design. Pursuing these recommendations will strengthen the body of knowledge that explores AI in higher education by informing institutional policy, refining instructional practices, and addressing equity in access to and the ethical use of AI.

Table 7

Recommendations for Future Research

Methodology	Design	Purpose
Quantitative	Quasi-Experimental	The purpose of this future research is to investigate the impact of AI-integrated assignment design on outcomes such as AI misuse, student engagement, course completion, and retention, thereby providing evidence on the effectiveness and generalizability of embedding ethical AI guidelines into coursework across diverse higher education settings.
Qualitative	Phenomenological	The purpose of this future research is to examine how inclusive AI practices shape access to education and learning experiences of neurodivergent students. The research aims to address gaps in understanding the barriers and enablers of diverse learners and educators' experiences with inclusive AI integration.
Mixed-Methods	Sequential Explanatory	The purpose of this future research is to measure students' and professors' attitudes toward AI-integrated coursework and perceptions of assignment fairness. A sequential explanatory design would capture generalizable patterns and contextualized meaning of the EIAIM framework.

The first recommendation for future research is for the researcher to conduct a quantitative quasi-experimental study to test the impact of AI-integrated assignment design on AI misuse, student engagement, course completion, and retention. The researcher could elect to use survey data to compare higher education institutions that implement AI-informed course design practices with those using traditional approaches or pilot the EIAIM-informed practices alongside traditional pedagogical models. The study would generate empirical evidence on the

effectiveness and generalizability of embedding ethical guidelines, such as the EIAIM framework, into coursework across diverse higher education settings.

The second recommendation for future research is for the researcher to conduct a qualitative phenomenological study to examine the lived experiences of professors and/or students navigating inclusive AI practices in higher education. The researcher could elect to conduct a phenomenological study at one or more universities that implement AI-integrated assignment policies or pilot the EIAIM framework to provide insights into the emotional, ethical, and pedagogical dimensions of AI usage, with a focus on neurodivergent learners. The research aims to fill the gap in understanding the barriers and enablers of diverse learners' and educators' experiences with inclusive AI integration.

The third recommendation for future research is for the researcher to conduct a mixed-methods sequential explanatory study to measure students' and professors' attitudes toward AI-integrated coursework. The researcher could elect to combine survey data with follow-up interviews or focus groups to measure quantitative data about attitudes toward AI-integrated coursework across higher education institutions. Meanwhile, qualitative interviews could provide insight into perceptions of assignment fairness, academic integrity, and accessibility. The study would strengthen the validity and applicability of frameworks such as EIAIM by grounding them in multi-layered evidence.

Conclusion

This chapter highlights the implications, recommendations, and conclusions that emerged from a qualitative exploratory case study on professors’ experiences and perceptions of students' use of LLM AI tools to complete assignments in the absence of proper AI usage guidelines in higher education. Using an exploratory case study design, I examined online professors'

experiences with students' use of LLM AI tools and their perceptions of how course assignments can be designed and evaluated to deter misuse at urban, 4-year degree-granting institutions in the United States. The findings reveal that strategically integrating AI tools with clear ethical guidelines for assignment design and enhancing digital literacy training can shift AI from being perceived as a threat to academic integrity to a tool that deepens knowledge construction, promotes equitable access, and empowers both professors and students. The findings underscore how this study's insights inform future institutional policy and models for effective teaching and learning across diverse academic populations. By investigating how neurodivergent students engage with LLMs in the higher education context, this study adds to the literature on inclusivity in AI integration in higher education. It also provides practical guidance for instructors and higher education institutions seeking to integrate AI tools in an ethical and equitable manner. The Ethical and Inclusive Artificial Intelligence Model (EIAIM), which emerged from this research, filled a gap revealed in the literature by providing a framework to translate these insights into practice.

This study conducted a nationwide investigation into professors' perspectives on students' use of AI in online courses within higher education. The findings underscore the importance of guidelines and policies that foster ethical integration, while providing inclusive strategies for students with diverse learning needs. As researchers continue to examine the integration of AI in higher education, the findings of this study can inform the development of ethical and inclusive policies that support effective teaching and learning. Higher education institutions should also consider using the EIAIM framework as a guide for designing assignments to deter AI misuse and promote ethical usage. By implementing the recommendations highlighted in this study, aligned with deterrence theory, institutions can

design assignments that promote ethical AI usage, deter misuse, and reinforce the credibility and relevance of learning in an AI-transformed higher education landscape.

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