

Chapter 8: A guide for qualitative researchers using Large Language Models with representative examples using ChatGPT

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Abstract

On November 30, 2022, ChatGPT, an AI chatbot, was released to the public, transforming an enigmatic tool into accessible software as a service. This sparked immediate debates among academicians about AI's impact on various facets of society, including academia, technology, economics, politics, and the environment. As discussions continue, AI is anticipated to significantly influence 21st-century life. Current literature on AI often emphasizes ethics, trust, bias, fairness, diversity, equity, inclusion, and privacy, yet lacks guidelines for qualitative researchers using AI in studies. This chapter, using ChatGPT as a representative of various Large Language Model (LLM) tools, outlines a framework for integrating AI into qualitative research, divided into six phases. These phases cover skills in questioning AI, understanding biases, transparency in AI use, problem-based research, shaping research purposes, and employing AI for data collection and analysis. Examples and transparency regarding ChatGPT's role in the chapter's creation are provided, offering both theoretical and practical guidance for qualitative researchers.

Keywords: AI, Artificial Intelligence, ChatGPT, Qualitative Research, LLMs, emerging technologies, transparency.

Introduction

The November 30, 2022, public release of ChatGPT, a form of Generative Pre-trained Transformer (GPT) or AI, allowed researchers first access to the user friendly AI and offered a free version. Previously use of GPT technologies was reserved for a limited population of researchers. With the release of the accessible free version of ChatGPT, a radical technology disruption began whereby former “non-consumers” suddenly had strong demand for the product. When the publicly available version of ChatGPT became accessible, academicians started debating its positive and negative effects, academically, socially, culturally, economically, and politically. In all likelihood Artificial Intelligence (AI) will be one of the most impactful phenomena of the 21st century. While recent literature on AI has focused on ethics, trust, bias, fairness, diversity, equity, inclusion, and privacy concerns, there is a paucity of literature using AI to conduct a research study. What follows is six phases for qualitative researchers to follow as a road map for using AI in qualitative research. ChatGPT was used throughout the chapter providing examples of how researchers can use it. When ChatGPT was asked to respond, the words *User Engineered Prompt* will show what was asked of ChatGPT and is followed by the response received back. In a number of examples, the response from ChatGPT was shortened due to word count restraints in the publication. ChatGPT was used as a research assistant throughout the creation of this chapter.

Phase 1-Learning to Use AI for Research

According to Clark and Perrault (2023) while earlier AI model usage and development was restricted to academics, recently private industry has taken the lead in production of large language models (LLM). AI aids with generating accurate and well written information, but can also hinder it. While in the field of science AI models are advancing progress and efficiency, the number of dangerous events due to the misapplication of AI and misinformation spread by AI are rapidly becoming evidenced. For example, the authors shared incidents in Ukraine with “deepfake” videos of particular note. An important take away in their report is that while countries like China with 78% of survey respondents, Saudi Arabia with 76%, India with 71% believing that products and services using AI have more positive than negative impact; of the U.S respondents only 35% shared that belief (Clark & Perrault, 2023).

Roberts et al. (2024) described how, given specific prompts, language models such as ChatGPT can efficiently generate well-crafted responses to questions, as well as develop interview questions and various qualitative tools. These models are capable of swiftly summarizing research and suggesting appropriate theoretical or conceptual frameworks. Additionally, they can serve as alternatives to MS Word or Grammarly by offering precise advice on grammar, mechanics, and usage, thereby enhancing the quality of a paper before it is submitted, (OpenAI, 2024). The first half of this paragraph was word smithed using ChatGPT. On the plus side these applications of AI seem practical and available to the qualitative researcher as if they had their own research assistant. On the negative side, ChatGPT can provide false information and make mistakes providing inaccurate, deceptive, and misleading information. It is still incumbent on the researcher to verify all claims. Roberts et al. suggested that reliance on AI can make qualitative researchers lose critical research and scholarly writing skills; in fact “deskilling” the researcher by its use (Roberts et al., 2024). This deskilling can also be symptomatic of a natural skill shift; however researchers must still be able to stand behind their claims and not surrender this task to automation. In pursuit of

this new balance, qualitative researchers must continue to hone their qualitative research skills, their library search skills, their critical reflection skills, their critical thinking skills, and their questioning skills as they begin to use AI as a research assistant. Lastly, questioning skills (or prompting) become paramount, as questions are what fuels the LLM's activity.

Prompt Engineering

A critical success factor in using ChatGPT and any AI is “prompt engineering” eliciting quality output. Engineering quality input in the information provided to the LLM and using questioning strategies and input prompts alongside a process of iterative revision, refinement, and repetition can yield specific, relevant, and high-quality responses. Creating a vision, goals, and objectives, which are clear, concise, contextual, and offering domain specific knowledge while simultaneously developing a deep understanding of the LLM, is necessary to receive high quality output from your prompts. And, ChatGPT can and often does make mistakes. Researchers must evaluate the responses they get from ChatGPT by reviewing seminal works on the topic(s), peer reviewed sources, and validated, dependable, and trustworthy data sources. As some in the field have hypothesized that prompt engineering may be dead as AI products become increasingly sophisticated employing automatic prompt tuning methods; others believe that the title of prompt engineer will remain in academia and industry for some time to come (Denkina, 2024). Will there ever be an adequate substitute for the cognitive knowledge, skills, and abilities of the researcher creating the prompts and evaluating the responses?

In crafting this chapter, ChatGPT was prompted to provide citations in correct APA 7 reference list format from peer reviewed articles in scholarly journals. While ChatGPT did provide a list for each topic and the list was in correct APA 7, none of the references were evidenced in two university libraries or through Google Scholar or through other search engines. A university librarian was given the task to search for the articles and further validated they were fake references. Qualitative researchers beware.

Hallucination in AI

In the context of artificial intelligence, particularly natural language processing models like ChatGPT, "hallucination" refers to instances where the AI generates information that is not based on the input data or factual reality. These can be fabrications or plausible-sounding statements that are inaccurate or entirely made up. Hallucinations occur because the model tries to produce coherent and contextually relevant responses based on the patterns it learned during training, even if it means inventing details. Hallucinations in AI can manifest in several ways:

1. Fabricated Facts: Providing incorrect or nonexistent facts, such as making up historical events or scientific data.
2. Inconsistent Information: Generating responses that contradict previously given information or established facts.
3. Nonexistent Entities: Mentioning people, places, or events that do not exist.
4. Over-interpretation: Giving overly specific interpretations or conclusions that go beyond the input data.

These hallucinations can be problematic in applications requiring high accuracy and reliability, such as academic research, medical information, and legal advice. Researchers are actively working on methods to reduce hallucinations, such as improving training data quality, refining model architectures, and incorporating fact-checking mechanisms. Some of the latest upgrades are mitigating some of these issues. These include:

1. Personalized Interactions: The ability to remember facts about the user and previous interactions for more personalized and contextually aware conversations.
2. Enhanced Tools and Integrations:
 - ✓ Tool Use: ChatGPT can use external tools like a web browser to fetch real-time information, perform calculations, and more.
 - ✓ Plugin Support: Integration with third-party plugins to extend functionality, such as fetching current events or accessing specialized databases.
3. User Interface Improvements:
 - ✓ Intuitive Design: A more user-friendly interface that simplifies interaction and makes accessing different features more straightforward.
4. Accessibility and Deployment:
 - ✓ API Access: Enhanced API for developers to integrate ChatGPT into various applications and services with more flexibility.
 - ✓ Cross-Platform Availability: Improved performance and availability across different devices and platforms.
5. Security and Privacy Enhancements:
 - ✓ Data Handling: Better data handling practices to ensure user privacy and security.
 - ✓ Content Moderation: Improved content moderation to prevent the generation of harmful or inappropriate content.
6. These updates make the latest version of ChatGPT more versatile, responsive, and user-friendly, offering a wide range of applications from casual use to professional integration.

Despite current and future enhancements LLM can be perilous for academicians, researchers, and anyone who is responsible for delivering accurate, trustworthy, credible, and dependable reports and articles, such as those who are qualitative researchers. Researcher knowledge, critical thinking, and validation of any and all information garnered through LLMs is of the utmost importance in the research field.

Researcher Cognitive Input

As Christou (2023a) argued AI requires prompt engineering from cognitive input given to it by the researcher to generate output of any kind. To that end the researchers' own cognitive abilities are central to the research process including identifying a problem worthy of study, a purpose statement, research questions, design choice, data collection methods, and data analysis methods, conclusions drawn, and future implications of the research.

Cross Referencing Data

ChatGPT does make mistakes due to biased or inaccurate data and often these mistakes are the result of a misunderstanding of the user's prompt meaning or intent. To mitigate these mistakes it is critical the researchers check the output of ChatGPT against traditional qualitative sources such

as seminal works, peer reviewed journal publications, and other scientific sources. Always check AI outputs before submitting your own work.

Continuous Improvement in AI

The latest updates to ChatGPT include enhanced accuracy, improved contextual understanding, and reduced hallucinations through cross-referencing verified sources. It now offers customizable personas and response styles, real-time data access, and better support for multi-turn conversations, maintaining context over extended interactions. These advancements significantly benefit researchers by providing more reliable, contextually relevant, and up-to-date information. The customizable features allow for tailored interactions, enhancing the utility of ChatGPT in various research scenarios, from data analysis to drafting research proposals, ultimately streamlining the research process and improving efficiency.

Phase 2-Acknowledgements of Chat CPT Tool Bias and Researcher Bias

Phase 2 describes developing an understanding of bias generated by the tool and the questions asked of it by the user. Since the researcher is engineering the prompts given to ChatGPT, the output will be reflective of research biases and underlying assumptions. In this phase the researcher must recognize and acknowledge how AI is used throughout a qualitative research study. It continues to be considered good scholarship to be transparent about sources and those include AI. Christou (2023b), concerned about the rise in distrust and misgivings in academia about the use of AI in qualitative research studies, suggested that it is critical that qualitative researchers acknowledge the use of AI by means of a declarative statement in their research papers. Combining AI with the researchers on cognitive skills, the researcher needs to critically reflect on their own biases and underlying assumptions. Researchers must be conscientious about the requirements in their institution as well as in the research literature to ensure their research is trustworthy, credible, dependable, and adheres to all standards regulating the use of AI.

Phase 3-Identifying Research Worthy Problems and Gaps in the Research

Qualitative research always begins with identifying a research worthy problem. There are differences in perspective of how to identify such a problem and ways to present it. Merriam and Tisdell (2016) suggested that a problem specifies that something is going wrong creating uncertainty and doubt needing resolution. Elaborating on this idea the authors explained that identifying the problem begins with questioning what is going wrong, that is challenging researchers in the general topic area of concern. To identify the specific problem of research focus, they suggested using a *funnel approach* going from the general area of concern at the top of the funnel to a narrow area of concern, focused on a specific gap in knowledge (Merriam & Tisdell, 2016).

Creswell and Poth (2024) asserted that the term “problem” may be misleading, and a better term might be what is the necessity or exigency related to the specific topic. Bloomberg and Volpe (2019) also emphasized the need to narrowly focus the problem under investigation. What is the area of focus about the issue that a study will address? What specifically is going wrong? Is there a societal issue surrounding the problem? What do we know about the topic? How is our

information flawed about the topic? What don't we know about the topic? What do we need to know? How is our current knowledge incomplete?

There are a variety of ways that AI and ChatGPT specifically can assist researchers in identifying a problem worthy of research study; a gap in the research literature. Start by selecting a topic area of interest from personal or professional experience. This will be the broad area to be investigated. One way to begin the investigation is to brainstorm ideas by asking ChatGPT, your research assistant, questions about areas within the topic where there is limited information or a lack of understanding. One of the keys to success with using AI is the quality of the prompts engineered by the researcher including the information provided and the crafting of the questions. ChatGPT can be an excellent research assistant supporting a doctoral student's research endeavors.

ChatGPT Example. When asking ChatGPT for help with the question “Given that AI and ChatGPT are relatively new tools for qualitative researchers, what are some gaps in the research that need to be studied about them using qualitative research designs?” Responses from ChatGPT included: understanding user experiences and perceptions, ethical and responsible AI use, trust, and reliability, contextual understanding, and interpretation the context and the limitations of AI in capturing nuanced meanings, cultural contexts, and subjective experiences, algorithmic bias and fairness, and training and self-development (Open AI, 2024). None of the responses included citations from the research literature, even when asked specifically for them. Often ChatGPT acknowledges that it does not have the capability of actually reviewing peer reviewed research journals and thus is providing only “hypothetical” output versus trustworthy accurate examples (Christou, 2023b). There is growing concern among academicians, regarding the use of ChatGPT in research with advice to impose higher standards for scholarly writing, multiple author identification verification for journal submissions, and in-depth training for students on how to use AI as well as reporting their use of it (Dergaa et al. , 2023)

Problem Statement Example. Using ChatGPT's recommendation of one of the gaps in the research literature needing exploration about AI, the following problem statement is used as an example in this chapter. With exponential growth in the use of ChatGPT by graduate students and researchers amid concerns of plagiarism, ethical violations, and issues surrounding trustworthiness, including credibility, confirmability, and dependability, the specific problem that is the focus of the study is that it is unknown how qualitative researchers are perceiving, experiencing, and using the tool, and the challenges they encounter when using ChatGPT for research tasks.

Phase 4- Using AI to Describe the Purpose, Research Questions, Target Population, Sample

There are numerous ways that AI and ChatGPT can help with the purpose statement, research questions, target population, and sample for the study. While the problem statement provides the foundation for the study, the purpose statement provides information on how it will be done. This section covers uses of AI for the purpose statement, target population, and sample. To begin the research, understanding the definitions and terminology in the research literature is essential.

Purpose Statement

After crafting the problem statement, the next step is to write the purpose statement which codifies the main goal, objectives, and intent of the study. The purpose statement must align fully with the problem statement and later with the research questions and design. The purpose statement explains exactly how the study will address the problem or as Creswell (1998) explained it provides a “road map” to guide the reader through the process that will be followed. The purpose statement includes the methodology, design, and target population. Next follows an interchange with ChatGPT.

User Engineered Prompt: “Please provide at least two examples of Creswell's script for a purpose statement from 1994, 1998, and 2003 using his exact words. Do not paraphrase”

ChatGPT Response: “I'm sorry for any confusion, but Creswell's specific script for a purpose statement has not been provided verbatim in his works. Instead, he typically offers general guidance on structuring purpose statements, but he doesn't provide a specific, word-for-word script. For example, in Creswell's 1994 book "Research Design: Qualitative and Quantitative Approaches," he outlines the components of a qualitative purpose statement, emphasizing the focus of the study, the participants, and the context.” (OpenAI, 2024)

A novice researcher might not have checked further to validate ChatGPT’s response causing an error in a paraphrase related to Creswell’s work. Creswell did in fact create a template/script for a purpose statement. Next Chat GPT was given very carefully engineered prompts to use Creswell’s specific script and the problem statement example and write a purpose statement to address the problem. the results of that inquiry follow.

User Engineered Prompt: Address the following research problem " Using ChatGPT’s recommendation of one of the gaps in the research literature needing exploration about AI, the following problem statement will be used as an example in this chapter. With exponential growth in the use of ChatGPT by graduate students and researchers amid concerns of plagiarism, ethical violations, and issues surrounding trustworthiness, including credibility, confirmability, and dependability, it is unknown how qualitative researchers are perceiving, experiencing, and using the tool, and the challenges they encounter when using ChatGPT for research tasks. " use the following script to write a purpose statement for a qualitative research study “The purpose of this _____(biographical, phenomenological, grounded theory, ethnographic, case) study is (was? will be?) to _____ (understand? describe? develop? discover?) the _____(central focus for the study) for _____ (the unit of analysis, a person? processes? groups? site). At this stage in the research, the _____ (central focus being studied) will be generally defined as _____(provide a general of the central concept)” (Creswell, 1998, p. 96)"

ChatGPT Response: “The purpose of this phenomenological study is to understand the perceptions, experiences, and usage patterns of qualitative researchers regarding ChatGPT, amidst concerns of plagiarism, ethical violations, and issues surrounding trustworthiness, including credibility, confirmability, and dependability. At this stage in the research, the perceptions and experiences of qualitative researchers regarding ChatGPT will be generally defined as their subjective understandings, interactions, and challenges encountered when utilizing the tool for research tasks." (OpenAI, 2024).

Research Questions

After aligning the problem and purpose statements for the study, the next step is to author the research questions. According to Bloomberg and Volpe (2019), to fully address the purpose of the study, the research questions must be answered. Therefore, it is critical that the research questions align fully with the problem statement and purpose statement. Here ChatGPT can be a good brainstorming tool for the researcher. Again, providing well written, clear and concise purpose statement and directions, the following interchange took place to get ChatGPT to generate research questions.

User Engineered Prompt: “Given the following purpose statement, The purpose of this qualitative phenomenological study will be to describe the perceptions, experiences, and patterns, frequency, and methods of usage regarding ChatGPT by doctoral students at accredited higher education institutions in the U.S., in light of concerns about plagiarism, ethical violations, and trustworthiness. At this stage in the research the perceptions, experiences, and patterns of qualitative doctoral researchers regarding ChatGPT will be defined as their subjective understanding of interactions and challenges they faced when using the tool for their doctoral dissertations, write three research questions for the study.”

ChatGPT Response: “Based on the provided purpose statement, here are three potential research questions for the qualitative phenomenological study:

1. How do doctoral students at accredited higher education institutions in the U.S. perceive and experience the usage of ChatGPT for their doctoral dissertations?
2. What are the patterns, frequency, and methods of usage of ChatGPT among doctoral students in the context of conducting research for their doctoral dissertations?
3. What challenges do qualitative doctoral researchers face when using ChatGPT for their doctoral dissertations, particularly in relation to concerns about plagiarism, ethical violations, and trustworthiness?” (OpenAI, 2024).

Of note is that ChatGPT was able to provide three good research questions based on the accurate information in the prompts given to it which included a well written purpose statement based on Creswell’s script and definitions and a solid problem statement that was adjusted from ChatGPT’s original suggestion through researcher review and confirmation by checking the current peer reviewed research literature.

Terminology

ChatGPT can assist with understanding terminology. For example, when ChatGPT was asked, “In qualitative research what are the definitions of the following terms with supporting citations from current or seminal peer reviewed research? Terms are general population, target population, sampling frame, and sample,” the response definitions were similar to those in research literature and the responses included citations from Creswell, Bryman, Babbie, and Neuman all with dates and page numbers. When the citation information was checked, much of it was incorrect. Checking the accuracy of the data supplied to you by ChatGPT including citations, page numbers, and references is critical to ensuring trustworthiness of the information presented in a study. Provided

with this data from ChatGPT, researchers should find the original sources and ensure that the content exists in the body of literature and that the original author's meaning is accurately reflected in the ChatGPT response. A key point which doctoral dissertation researchers must remember is that ChatGPT is not always right, and that the trustworthiness of a doctoral dissertation is the researcher's responsibility to ensure accuracy.

General Population, Target Population, Sampling Frame, and Sample

Using definitions from the research literature provided to ChatGPT, along with a well-designed purpose statement crafted for the study, ChatGPT can be utilized to help define the general population, target population, sampling frame and sample for the study being developed.

Remember that using ChatGPT to guide with terminology can be valuable. However, slight deviations in the prompts and instructions you give ChatGPT can seriously compromise the trustworthiness of your assertions and the sources you are using. Qualitative researchers cannot afford to assume AI to be correct. Researchers must validate what it recommends with the researchers' own critical views of the research literature. Suggestions from ChatGPT for the example study.

ChatGPT Response:

“1. General Population:

- Definition: The general population refers to the entire group of individuals that the researcher is interested in studying and to which they intend to generalize their findings.

- In this study, the general population would be doctoral students at accredited higher education institutions in the U.S.

2. Target Population:

- Definition: The target population refers to the specific subset or group within the general population that the researcher intends to study and make inferences about.

- The target population in this study would be doctoral students at accredited higher education institutions in the U.S. who have used or are using ChatGPT for their doctoral dissertations.

3. Sampling Frame:

- Definition: The sampling frame is a list or representation of the elements within the target population from which the researcher selects their sample.

- The sampling frame for this study could be a list of doctoral students enrolled in accredited higher education institutions in the U.S. who are currently working on or have completed their doctoral dissertations using ChatGPT.

4. Sample:

- Definition: A sample is a subset of individuals selected from the sampling frame and represents the population of interest for the purpose of study.

- The sample for this study would consist of a subset of doctoral students from the sampling frame who have experience using ChatGPT for their doctoral dissertations. This subset would be selected to participate in the phenomenological qualitative research study to describe their perceptions, experiences, and patterns of usage regarding ChatGPT” (OpenAI, 2024).

Phase 5 – Using ChatGPT to Create Qualitative Data Collection Instruments

The design of the qualitative study is selected during the writing of the purpose statement providing a high-level blueprint for how the study will be conducted. Typically, data collection sources are accompanied by data collection instruments and include: interviews using an interview guide, focus group interviews using a focus group interview guide and protocol, open-ended questionnaires, closed-ended surveys (primarily for triangulation), observations using an observation guide, participant journals, and an archival document checklist used for analyzing existing data, such as course syllabi, course materials, program descriptions, organizational, professional, and government report data, web-site content, etc.

ChatGPT as a Brainstorming Tool. When ChatGPT was asked what were the most widely used data collection methods in phenomenological inquiry, the answer included in-depth interviews, focus groups, observations, field notes, documents or artifacts, photo voice, and diaries or journals, which is consistent with the research literature. In this capacity, ChatGPT serves as a good brainstorming tool for researchers.

Using ChatGPT for Interview Guide Questions. Interviews are the most frequently used and important sources of data in all types of qualitative designs. Hence, the quality of the instruments developed and used to conduct the interview will influence the study results, implications, and conclusions. The background data provided to ChatGPT, and the formation of well-engineered prompts given to ChatGPT based on the researcher's own knowledge, skills, and ability in research design and the content area is critical in determining the quality of the information generated by responses from ChatGPT. Following is an example of a question asked ChatGPT and ChatGPT's response and recommendation for questions to be used in an interview guide to address the study problem, purpose, and research questions. Note the structure of the prompts and the content provided to address the question. The researchers content knowledge, cognitive abilities, and questioning ability are all critical to the quality of the responses derived from brainstorming with ChatGPT. which follows displays an example of how ChatGPT might be used to help create an interview guide.

User Engineered Prompt: "Creating a qualitative phenomenological research study with the following problem statement, purpose statement, and research questions, Problem Statement: With exponential growth in the use of ChatGPT by graduate students and researchers amid concerns of plagiarism, ethical violations, and issues surrounding trustworthiness, including credibility, confirmability, and dependability, it is unknown how qualitative researchers are perceiving, experiencing and using the tool, and the challenges they encounter when using ChatGPT for research tasks. Purpose Statement: The purpose of this qualitative phenomenological study will be to describe the perceptions, experiences, and patterns, frequency, and methods of usage regarding ChatGPT by doctoral students at accredited higher education institutions in the U.S., in light of concerns about plagiarism, ethical violations, and trustworthiness. At this stage in the research the perceptions, experiences, and patterns of qualitative doctoral researchers regarding ChatGPT will be defined as their subjective understanding of interactions and challenges they faced when using the tool for their doctoral dissertations. 1. Research Questions: How do doctoral students at accredited higher education institutions in the U.S. perceive and experience the usage of ChatGPT for their doctoral dissertations? 2. What are the patterns, frequency, and methods of usage of ChatGPT among doctoral students in the context of conducting research for their doctoral dissertations? 3. What challenges do qualitative doctoral researchers face when using ChatGPT

for their doctoral dissertations, particularly in relation to concerns about plagiarism, ethical violations, and trustworthiness? write interview questions using Irving Seidman's three interview series, write 12-15 interview questions that will address the purpose of the study and answer the research questions.”

ChatGPT Response: “Irving Seidman's three interview series are designed to probe deeper into the participant's experiences, perceptions, and challenges. Here are some interview questions tailored to each series that would address the purpose of the study and answer the research questions:

First Interview Series: Descriptive

1. Can you describe your overall experience with using ChatGPT for your doctoral dissertation?
2. How did you initially come to know about ChatGPT, and what prompted you to use it for your research?
3. Can you walk me through a typical session or interaction you had with ChatGPT while working on your dissertation?
4. What specific features or aspects of ChatGPT did you find most helpful or valuable for your research tasks?
5. Could you describe any instances where you encountered challenges or limitations while using ChatGPT for your doctoral dissertation?

Second Interview Series: Structural“ (OpenAI, 2024).

Overall ChatGPT made good recommendations. Rather than simply asking questions that can be answered with yes or no or a few words, making the questions more open-ended would be beneficial. For example, “can you,” “could you,” you might be replaced with “please describe,” “discuss,” and “walk me through.”

Using ChatGPT for an Observation Guide. Participation observation is a powerful tool for data collection for qualitative researchers. DeWalt and DeWalt (2011) defined participant observation as “a method in which a researcher takes part in the daily activities, rituals, interactions, and event of a group of people as one of the means of learning the explicit and tacit aspects of their life routines and their culture”(p. 1). ChatGPT can be a useful assistant in creating guides for researchers to codify their experiences in the field. This type of data collection source can yield strong results for a variety of qualitative research designs such as phenomenology, ethnography, case study, including design and development case study research. An example of using ChatGPT as an assistant in creating an observation guide follows.

User Engineered Prompt: “Creating a qualitative phenomenological research study with the following problem statement, purpose statement, and research questions, Problem Statement: With exponential growth in the use of ChatGPT by graduate students and researchers amid concerns of plagiarism, ethical violations, and issues surrounding trustworthiness, including credibility, confirmability, and dependability, it is unknown how qualitative researchers are perceiving, experiencing and using the tool, and the challenges they encounter when using ChatGPT for research tasks. Purpose Statement: The purpose of this qualitative phenomenological study will be to describe the perceptions, experiences, and patterns, frequency, and methods of usage regarding ChatGPT by doctoral students at accredited higher education institutions in the U.S., in light of

concerns about plagiarism, ethical violations, and trustworthiness. At this stage in the research the perceptions, experiences, and patterns of qualitative doctoral researchers regarding ChatGPT will be defined as their subjective understanding of interactions and challenges they faced when using the tool for their doctoral dissertations. 1. Research Questions: How do doctoral students at accredited higher education institutions in the U.S. perceive and experience the usage of ChatGPT for their doctoral dissertations? 2. What are the patterns, frequency, and methods of usage of ChatGPT among doctoral students in the context of conducting research for their doctoral dissertations? 3. What challenges do qualitative doctoral researchers face when using ChatGPT for their doctoral dissertations, particularly in relation to concerns about plagiarism, ethical violations, and trustworthiness? write an observation guide, using Stearns, Morgan, and Caprano's technique for writing an observation guide, write 12-15 observation statements that will address the purpose of the study and answer the research questions.”

ChatGPT Response: “Stearns, Morgan, and Caprano's technique for writing an observation guide involves crafting statements that guide the observer's attention towards specific behaviors, interactions, or phenomena relevant to the study. Here are 12-15 observation statements tailored to address the purpose of the study and answer the research questions:

1. Observe how doctoral students initiate and engage with ChatGPT during their research activities.
2. Note the frequency with which doctoral students consult ChatGPT throughout their dissertation writing process.
3. Pay attention to the types of research tasks for which doctoral students rely on ChatGPT, such as generating literature reviews, formulating research questions, or drafting sections of their dissertations.
4. Observe any instances where doctoral students' express concerns or hesitations before using ChatGPT for research-related tasks.
5. Note the strategies doctoral students employ to integrate ChatGPT-generated content into their dissertations while maintaining academic integrity.
6. Note the level of awareness doctoral students demonstrate regarding the limitations and biases inherent in ChatGPT's algorithms and datasets” (OpenAI, 2024).

Using Chat GPT for a Survey. Qualitative researchers vary in their opinions about the usefulness of using closed-ended surveys for triangulation in qualitative study designs. Surveys are typically simple designs used to summarize participant responses with statistical data such as percentages, frequency counts, and statistical data like mean, medium, mode, and standard deviations. Closed-ended surveys are more often used in quantitative research. However, they can be useful in techniques such as a nominal group technique (NGT) whereby researchers are using the tool to analyze qualitative data across individual expert interviews and/or focus group interviews. Armstrong and Gale (2018) used the NGT as a five-step process whereby participants met together in a focus group, generated ideas based on their pre-work review of a model, shared their ideas with the group, discussed their ideas, and voted and ranked items based on original questions about the models. In addition to the discussion session, participants were asked to complete a survey ranking elements of the model using a Likert-scale. The analysis generated from a survey based on a NGT can help case study researchers doing design and development research and action research to determine what type of content, sequencing, etc. is best suited for program, course,

model, and tool research. Next is the user engineered prompt followed by the survey created by ChatGPT.

User Engineered Prompt: “Creating a qualitative phenomenological research study with the following problem statement, purpose statement, and research questions, Problem Statement: With exponential growth in the use of ChatGPT by graduate students and researchers amid concerns of plagiarism, ethical violations, and issues surrounding trustworthiness, including credibility, confirmability, and dependability, it is unknown how qualitative researchers are perceiving, experiencing and using the tool, and the challenges they encounter when using ChatGPT for research tasks. Purpose Statement: The purpose of this qualitative phenomenological study will be to describe the perceptions, experiences, and patterns, frequency, and methods of usage regarding ChatGPT by doctoral students at accredited higher education institutions in the U.S., in light of concerns about plagiarism, ethical violations, and trustworthiness. At this stage in the research the perceptions, experiences, and patterns of qualitative doctoral researchers regarding ChatGPT will be defined as their subjective understanding of interactions and challenges they faced when using the tool for their doctoral dissertations. 1. Research Questions: How do doctoral students at accredited higher education institutions in the U.S. perceive and experience the usage of ChatGPT for their doctoral dissertations? 2. What are the patterns, frequency, and methods of usage of ChatGPT among doctoral students in the context of conducting research for their doctoral dissertations? 3. What challenges do qualitative doctoral researchers face when using ChatGPT for their doctoral dissertations, particularly in relation to concerns about plagiarism, ethical violations, and trustworthiness? write 10-25 survey questions using a 4-point Likert-scale to address the problem, purpose, and research questions.”

ChatGPT Response: Sure, here are 5 survey questions using a 4-point Likert scale to address the problem, purpose, and research questions:

1. When conducting your doctoral dissertation research, to what extent do you perceive ChatGPT as a useful tool?
 - 1: Not useful at all
 - 2: Slightly useful
 - 3: Moderately useful
 - 4: Extremely useful
2. How frequently do you use ChatGPT during your doctoral dissertation research?
 - 1: Never
 - 2: Rarely
 - 3: Occasionally
 - 4: Frequently
3. How would you rate your overall experience of using ChatGPT for your doctoral dissertation research?
 - 1: Very negative
 - 2: Somewhat negative
 - 3: Neutral
 - 4: Positive
4. To what extent do you believe ChatGPT helps you generate ideas and content for your dissertation?
 - 1: Not at all

- 2: To a small extent
 - 3: To a moderate extent
 - 4: To a great extent
5. How confident are you in the accuracy and reliability of the content generated by ChatGPT for your dissertation?” (OpenAI, 2024).

Phase 6- Using AI for Qualitative Data Analysis

Thematic analysis of qualitative data such as the data collection sources described earlier is an important application for ChatGPT for qualitative researchers. Braun and Clarke (2019; 2022) emphasized there are two types of thematic analysis: deductive and inductive. Using deductive thematic analysis, the researcher is guided by an existing theoretical and/or conceptual framework through which the codes are developed. In inductive, the analysis is driven by the data content and often both are used in a single study. Braun and Clarke’s (2006) six steps of data analysis include: familiarization with the data, coding either deductively inductively, or a blend, looking for pattern and themes in the data, reviewing and consolidating the themes, naming, defining, and describing the themes, and then writing a report of findings.

ChatGPT can be utilized for qualitative data analysis by leveraging its natural language processing capabilities to identify themes, patterns, and insights from large volumes of textual data. Researchers can input interview transcripts, open-ended survey responses, or focus group discussions into ChatGPT, which can then assist in coding the data, categorizing responses, and highlighting significant trends. This can be useful when the researcher begins applying deductive analysis using a list of start codes as suggested by Miles, Huberman, and Salanda, (2022). By summarizing the content and suggesting potential themes, ChatGPT streamlines the initial stages of qualitative analysis, making it faster and more efficient. Additionally, it can provide alternative interpretations and generate hypotheses, aiding researchers in exploring different perspectives and ensuring a comprehensive analysis. However, it is essential for researchers to validate and critically assess the AI-generated insights to ensure accuracy and relevance.

There are a number of issues and areas of concern using ChatGPT for qualitative data analysis. These include lack of transparency caused by the “black box” problem whereby researchers do not know how their prompts are being analyzed and processed, causing a need for enhancing transparency in the future which is of paramount importance. The next issue is consistency. Prompt engineering drives the output in any ChatGPT response and even small alterations in input prompts can cause major differences in output responses. This is exacerbated by ChatGPT’s memory issues preventing it from remembering its former responses in a multi-session dialogue. Next is ChatGPT’s too broad and often ambiguous output responses. Finally lack of a focused, fixed perspective having no beliefs or priorly held positions, therefore, its output responses may end up contradictory. Again, prompt engineering that is written with a high degree of precision and based on valid and reliable inputs, is critical when having ChatGPT assist in thematic data coding. Learning how to design prompts effectively takes an elevated level of cognitive knowledge in the topic area and about qualitative research, which is often difficult and time consuming (Zhang et al., 2023).

Conclusion

In this chapter the integration of AI, specifically ChatGPT, into qualitative research methodologies were explored through a comprehensive six-phase framework. Phases 1 and 2 are specific to the use of Chat GPT or any AI tool and will apply to all future versions. Phases 3-6 are standard phases in qualitative research and will be valuable to follow as the researcher becomes familiarized with new versions of the ChatGPT tool as well as with other AI tools. As the use of AI in research becomes increasingly prevalent, it is essential to address both its potential benefits and limitations. Through each phase, from learning to use AI effectively to identifying research problems and developing research questions, data collection, and analysis researchers are provided with guidance on leveraging AI tools while maintaining critical thinking skills and rigor.

One of the key takeaways from this chapter is the importance of understanding and acknowledging both the biases inherent in AI tools and those of the researchers themselves. Phase 2 emphasizes the need for transparency in acknowledging the use of AI in research and recognizing how it may shape the outcomes. Another takeaway is the peril researchers can and will face if they do not validate the responses received from the LLM. Wiley publications have encountered significant issues due to research errors stemming from the use of Large Language Models (LLMs) like ChatGPT. These errors, caused by "hallucinations," involve the AI generating false or fabricated information, which undermines the reliability of published research. Consequently, Wiley has retracted numerous articles and shut down 19 scholarly journals to maintain academic integrity. Their retraction process involves clearly marking retracted articles and issuing notices to inform readers of the errors. This underscores the importance of rigorous review and verification processes to prevent such problems and uphold the credibility of scientific publications. Researchers must critically reflect on their biases and assumptions throughout the research process to ensure credibility and trustworthiness. Researchers must validate any findings or suggestions made by an LLM. Looking ahead, the evolution of ChatGPT and similar AI tools presents both opportunities and challenges for qualitative research. As AI technology continues to advance, there is potential for more sophisticated and nuanced responses, allowing researchers to delve deeper into complex research questions. However, researchers must remain vigilant in verifying AI-generated outputs and maintaining control over the research process.

With the latest release of ChatGPT qualitative researchers have a more comprehensive and accurate responses to researchers' inquiries, incorporating a deeper understanding of context and nuance. This enables researchers to rely more heavily on AI for tasks such as data analysis and literature review, while still exercising critical judgment and oversight. Despite these new developments and potential future developments, the phases outlined in this chapter will remain applicable and useful. They provide a structured approach for integrating AI into qualitative research methodologies, ensuring that researchers maintain control over the research process and uphold standards of rigor and integrity. By continuing to refine their skills in prompt engineering, critical thinking, and research design, qualitative researchers can harness the power of AI while mitigating its potential pitfalls.

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