The Distinctions Between Theory, Theoretical Framework, and Conceptual Framework

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Abstract

Health professions education (HPE) researchers are regularly asked to articulate their use of theory, theoretical frameworks, and conceptual frameworks in their research. However, all too often, these words are used interchangeably or without a clear understanding of the differences between these concepts. Further problematizing this situation is the fact that *theory*, *theoretical framework*, and *conceptual framework* are terms that are used in different ways in different research approaches. In this article, the authors set out to clarify the meaning of these terms and to describe how they are used in 2 approaches to research commonly used in HPE: the objectivist deductive approach (from theory to data) and the subjectivist inductive approach (from data to theory). In addition to this, given that within subjectivist inductive research *theory*, *theoretical framework*, and *conceptual framework* can be used in different ways, they describe 3 uses that HPE researchers frequently rely on: *fully inductive theory development*, *fully theory-informed inductive*, and *theory-informing inductive data analysis.*

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Researchers working in health professions education (HPE) are often advised to address one, some, or all of the following concepts: *theory*, *theoretical framework*, and *conceptual framework*. For instance, HPE scholars are advised to integrate *theory* into research.[1–5] Granting bodies ask that a project's *theoretical framework* be articulated in funding requests.[6] Review criteria for research reports prompt reviewers to assess whether the study's *conceptual framework* is explicitly described and justified.[7] Meeting these mandates requires HPE community members to know the answers to some foundational questions: What is *theory*? How is a *theory* distinct from a *theoretical framework*? Does the term *conceptual framework* refer to something altogether different from a *theory* or *theoretical framework*? Unfortunately, clear answers to these questions are not readily available. After searching the literature, we were disappointed to realize that few publications explicitly answer these questions. Furthermore, those publications that do provide answers rarely pay attention to how definitions can differ across the variety of research approaches represented within HPE scholarship. If HPE scholars are to effectively work with *theory*, *theoretical frameworks*, and *conceptual frameworks*, we need to clarify these terms.

HPE is a vibrant multidisciplinary and paradigmatically eclectic domain where scholars bring their varied disciplinary traditions and vocabularies to the research endeavor.[8–10] Since the terms *theory*, *theoretical framework*, and *conceptual framework* can have different interpretations and applications across paradigms, our eclecticism sometimes finds HPE scholars working at cross-purposes. Indeed, a lack of appreciation of the differences between these terms can have detrimental consequences. Without clarity, we risk falsely assuming shared interpretations and applications of these terms. We risk naively labeling some research designs as faulty, poorly executed, or lacking in rigor, when in fact those designs are employing different paradigmatically informed interpretations of these terms. We also risk impeding our collective efforts to build on the knowledge generated across paradigms. In other words, without clarity, we risk doing consequential harm to our own field. Therefore, in this paper, we set out to clarify the differences and relationships between the terms *theory*, *theoretical framework*, and *conceptual framework*.

There are many ways to articulate these different understandings. For instance, we could offer a historical description of how each term's definition and application evolved over time; however, this could falsely imply that the more modern descriptions should replace older interpretations. Alternatively, we could frame our descriptions across the qualitative/quantitative divide; however, this dichotomy describes only the type of data being collected rather than usefully informing when and how to use a *theory*, a *theoretical framework*, or a *conceptual framework*. To avoid these and other pitfalls, we constructed a way of describing these terms that highlights the similarities across paradigms but that also respects important paradigmatic differences. We structure this article around 2 approaches to research commonly used in HPE: the objectivist deductive approach and the subjectivist inductive approach. While research exists across a continuum from inductive to deductive, and from subjective to objective, offering descriptions across these continua is beyond the scope of this article. Therefore, we adopt archetypal

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stances for each approach to make our descriptions more accessible. First, we define the terms *theory*, *theoretical framework*, and *conceptual framework*. Then, we describe how objectivist deductive researchers and subjectivist inductive researchers engage with these terms.

Defining the Terms

Theory

In both objectivist deductive and subjectivist inductive research, the term *theory* holds largely the same meaning. A theory is a set of propositions that are logically related, expressing the relation(s) among several different constructs and propositions.[11] In other words, a theory is an abstract description of the relationships between concepts that help us to understand the world. A theory can be supported by preliminary data or by a vast body of research—the more data supporting the theory, the stronger it becomes.

Theories can be descriptive (i.e., naming and characterizing a phenomenon), explanatory (i.e., clarifying the relationships between phenomena), emancipatory (i.e., articulating the oppression of a people), disruptive (i.e., extending existing knowledge or refuting it), or predictive (i.e., predicting an outcome based on specific inputs). Theories can also have different levels of explanatory power. There are grand theories that are highly abstract and that tend to be concerned with broad natural or social patterns (e.g., Marxist theories of society), middle-range theories that address more specific aspects of human interactions (e.g., actor–network theory), and microtheories that focus on individual-level phenomena (e.g., symbolic interactionism).

There are often multiple theories that inform our understanding of a single phenomenon. For example, there are many theories of human *agency* (i.e., *agency* can be defined as the extent to which individuals are able to exert control in their personal and social lives). These theories offer abstract conceptualizations of whether a person has agency, how that agency exists, how it is supported and/or obstructed, and how an individual's agency exists in a larger social context (e.g., in a team, an organization, or a society). As Varpio et al[12] point out, theorists such as Giddens, Bourdieu, Butler, McNay, and Bandura have all addressed different aspects of agency, each offering different insights into the phenomenon. As this example illustrates, many scholars offer competing theories explaining phenomena. Therefore, HPE researchers must read broadly to select the theory that can best inform their research into a particular phenomenon.

Theoretical framework

A theoretical framework is a logically developed and connected set of concepts and premises—developed from one or more theories—that a researcher creates to scaffold a study.* To create a theoretical framework, the researcher must define any concepts and theories that will provide the grounding of the research, unite them through logical connections, and relate these concepts to the study that is being carried out.[13] In short, a theoretical framework is a reflection of the *work* the researcher engages in to *use* a theory in a given study.

Conceptual framework

A conceptual framework is the justification for why a given study should be conducted. The conceptual framework (1) describes the state of known knowledge, usually through a literature review; (2) identifies gaps in our understanding of a phenomenon or problem; and (3) outlines the methodological underpinnings of the research project. It is constructed[14] to answer 2 questions: "Why is this research important?" and "What contributions might these findings make to what is already known?"

How Objectivist Deductive and Subjectivist Inductive Research Approaches Apply These Concepts

While the terms *theory*, *theoretical framework*, and *conceptual framework* share common meanings across different research approaches, the ways in which they are applied vary greatly between objectivist deductive and subjectivist inductive approaches. We developed Figure 1 to illustrate key distinctions and relationships across these terms and their applications.

*For studies that seek to develop theory, these concepts and premises may be taken from a theoretical tradition.

The objectivist deductive approach to research

Deductive research involves going from general, abstract conceptualizations to observable and measurable data within a specific context. It is a top-down approach. From abstract conceptualizations, a hypothesis is derived and tested. Findings may falsify, support, refine, challenge, or extend the conceptualizations. Paradigms that often use an objectivist deductive approach include positivism[15] and postpositivism.[16]

Objectivist deductive research rests on the assumptions that (1) there *is* an external reality (i.e., a real world that exists independent of the researcher) and (2) reality can be understood by collecting objective, unbiased data about that reality. Research in this approach builds knowledge by developing increasingly better understandings of, and insights into, the causal workings of the world.† One of the most common approaches to objectivist deductive work is the use of experiments—whether in a lab, in a classroom, or naturalistic. Research questions in this approach tend to focus on testing underlying assumptions about how something works by testing a cause-and-effect relationship underpinning a phenomenon.

How objectivist deductive researchers use theory. When a researcher engages in objectivist deductive research, a theory is generally the starting point for the research project. The theory offers testable components including, for example: the cause-and-effect relationships that can be examined, the concepts that should be operationalized, and the variables that are relevant to control. These testable components are used to generate specific hypotheses which are the foundation for a study. In this approach, a central assumption is that the theory is part of the object of research. In other words, the hypothesis being tested is an aspect of the theory of interest. Thus, the study is simultaneously testing a hypothesis derived from theory and the accompanying theory underlying that hypothesis.

†This is a general description of the objectivist epistemology. It is more nuanced when it is used in individual research paradigms. For example, positivists embrace a radical objectivist epistemology,[15] while postpositivists embrace a relative objectivist epistemology.[16]

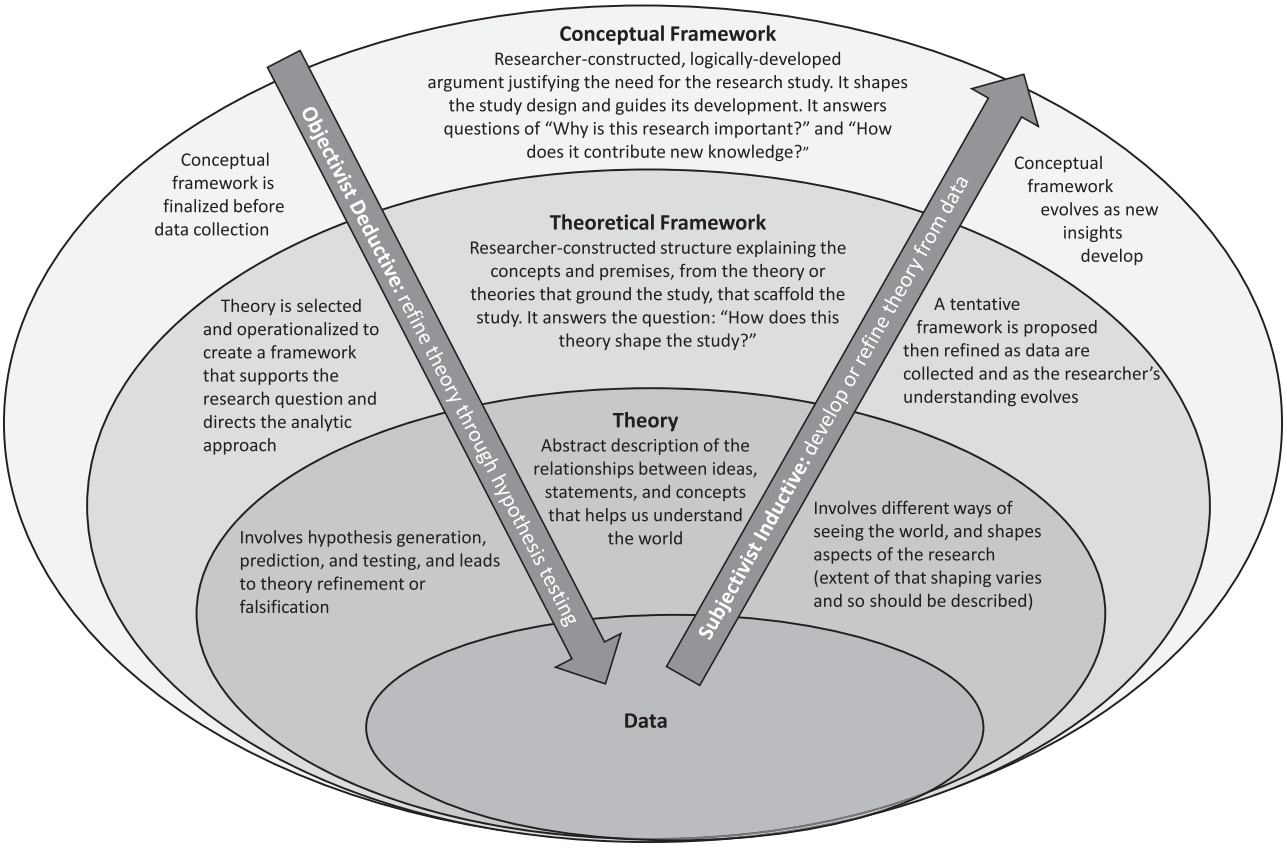

Figure 1 Visual depiction of the similarities and differences between *theory*, *theoretical framework*, and *conceptual framework* across objectivist deductive and subjectivist inductive approaches to research.

There are 2 key characteristics of theory shared by all research conducted from an objectivist deductive approach: a theory must (1) be testable and (2) be open to being falsified. A good theory, in this approach, typically builds on previous work. A study adds new knowledge by adding another building block of evidence to support, refine, or challenge a theory. This approach to research builds knowledge slowly—incremental studies in programs of theory-oriented work construct ever more refined understandings of phenomena, which allow for better future predictions and/or a more robust theory.

In a purely objectivist deductive approach, a researcher would rarely combine multiple theories in a single study. Starting with multiple theories makes the creation of a single, theory-informed hypothesis difficult. The combination of theories makes it hard to identify the specific causal nature of the relationship under study and would break the chain of inferences available from the progressive testing and refinement of a theory. In an objectivist deductive approach, there is a linear progression that needs to be followed: from theory, to hypothesis development, to data collection, to interpretation of findings, to the refinement of theory or the generation of new causal explanations. The revised or new theory developed through research can become the start of a new study.

How objectivist deductive researchers use a theoretical framework. The objectivist deductive researcher begins by identifying the theory from which to build the study's theoretical framework. The researcher puts the theory into action as a theoretical framework by: articulating why the current context is a legitimate area of study for a given theory, shaping the constructs of interest, articulating the specific language and assumptions of the research question, identifying the variables and conditions of interest, and orienting the approach to analysis. This is the *work* the theoretical framework presents to readers to render a theory operational, testable, and able to be used to predict, test a hypothesis, or explain a phenomenon.

In the objectivist deductive tradition, a theoretical framework is typically constructed before data collection and is fixed—meaning that a theoretical framework is written before the study beings and remains largely unchanged throughout the research process. After choosing a theory, the researcher can construct the theoretical framework that turns the theory into the object of study. Thanks to this work, the study is well positioned to advance knowledge because it puts the theory to the test and unites findings across research contexts. Not surprisingly, then, peer reviewers of objectivist deductive research look for a theoretical framework to be made explicit because the framework shapes the design of the study and describes how the current research joins a lineage of inquiry done using the same theory.

How objectivist deductive researchers use a conceptual framework. In objectivist deductive research, a conceptual framework typically includes a description of relevant literature, a summary of the relevant theory, an explanation of why this theory could be informative to this context, a specific research question that likely contains a hypothesis, a rationale for the research

methodology adopted, and a series of outcomes or variables of interest. A conceptual framework is finalized before the study and is rarely modified once data collection has started.

The subjectivist inductive approach to research

Inductive research involves going from specific data relating to a particular phenomenon to a general or abstract conceptualization of the phenomenon. It is a bottom-up approach (i.e., working from data up to abstract conceptualizations). Subjectivist inductive research does *not* begin with a hypothesis; instead, this research begins with a desire to understand or explain a particular phenomenon. The researcher collects data of and/or about this phenomenon and searches for patterns across the data to generate an understanding of the phenomenon. Paradigms that often use the subjectivist inductive approach include constructionism[17] and critical theory.[18]

Subjectivist inductive research rests on the assumptions that (1) reality is socially and experientially constructed (i.e., reality is an unsteady social construction that exists *not* because there is a natural, external reality but because individuals and social groups share interpretations and understandings of reality) and (2) to understand these realities, researchers need to explore the meanings constructed by individuals and groups. This means that knowledge is subjective—one person's understanding of a phenomenon may not be the same as another person's understanding. By collecting data from a multitude of perspectives, we can gain a richer and more nuanced understanding of the phenomenon. A common approach to subjectivist inductive research involves exploring a phenomenon in a specific context, often via interviews, focus groups, and/or observations. Researchers actively and subjectively construct research findings in collaboration with study participants.‡ Research questions in this approach explore phenomena or assumptions to increase our understanding of them.

‡This is a general description of the subjectivist epistemology. Is it more nuanced when it is used in a specific paradigm. For instance, critical theory embraces a relative subjectivist epistemology,[18] while constructionists adhere to a radical subjectivist epistemology.[17]

How subjectivist inductive researchers use theory. In the subjectivist inductive approach, theory not only exists as an abstract description that researchers read and debate, but it can also reside within the researcher as a cognitive frame that shapes his or her thinking and research design choices. In this approach, theory is not stable. It is constantly evolving, informed by researchers' experience, values, and perceptions. Furthermore, the subjectivist inductive researcher can engage with a single theory or with several theories in a single study or across a program of research.

There are 3 main ways that theory is used by subjectivist inductive researchers.[19] First, theory can be the product of research. Some subjectivist inductive research—notably researchers working in Glaser and Strauss's grounded theory tradition[20]—generates theory from the data. Thus, theory is *not* used to inform study design but is the major output of the research project and evolves out of a systematic inductive approach to data analysis. This approach represents the most fully inductive approach to subjectivist inductive research. We label this the *fully inductive theory development* study design.

Second, one or more theories can inform the entire research process. Here, theory shapes every stage of the research process, including the development of a research question, methodological choices, data collection, data analysis, and study conclusions.[21–23] The theories informing research are articulated at the outset of the investigation, and all parts of the study design are justified in relation to how they align with the theories. In other words, theory is an all-informing conceptualization that permeates all facets of the study.[24] In this approach, the refinement of these existing theories or the development of a new theory may be a major output of the research project. We call this the *fully theory-informed inductive* study design.

Third, theory can be an interpretive tool. For some researchers, the decision as to which theory or theories will inform the final interpretations of the data is a choice that can only be finalized during the data collection and analysis cycles. The researcher holds many theories in mind when designing the study and engaging in data collection. It is not until data analysis processes are underway that the researcher will determine which theory or theories should shape the final study interpretations and conclusions. Consequently, the researcher may have to modify the study design partway through data analysis when he or she realizes that a particular theory is relevant. For instance, if during early cycles of data collection and analysis the researcher realizes that a particular theory can help elucidate the data, later cycles of data collection and analysis might seek to specifically consider data that will confirm, refute, or offer new insights into the theory. This is not a study design flaw. Instead, it is the result of deep exploration of data that reveals a particular theory to be relevant to the study findings. Here again, development and refinement of theory can come as the end result of the research. We label this the *theory-informing inductive data analysis* study design.

These 3 ways of engaging with theory are all equally valid. To be rigorous, however, researchers must make an early, explicit decision as to when and how they will use theory in their research. Often, revisions to the theory will be part of the contributions made to knowledge by the research project. Indeed, theoretical contributions are highly valued in inductive research; developing a new theory or challenging, adding to, or refining a preexisting theory is met with high regard.

How subjectivist inductive researchers use a theoretical framework. To create a theoretical framework, the subjectivist inductive researcher must first decide which of the 3 study designs described above he or she will be using (i.e., *fully inductive theory development*, *fully theory-informed inductive*, or *theory-informing inductive data analysis*). This decision will guide the development of the theoretical framework, including practical decisions of research design (e.g., the design of interview or focus group questions, study participant selection, the sensitizing concepts [if applicable]).

If using a *fully inductive theory development* study design, theory will not shape the study design. There is no theoretical framework to develop because there is no theory to build into the structure of the research. Instead,

the study will depend on a robustly developed conceptual framework (see below).

If using a *fully theory-informed inductive* study design, the researcher must decide which theory or theories will be used as the lens and then transform the theory into a framework that explains how theory shapes the research questions, the way the research context is approached, the concepts that underpin the study design, the choice of methodology, the data collection, the interactions with study participants, the analysis processes, and the conclusions drawn. If more than one theory is used, the researcher must also describe how the theories inform each other and how they inform all aspects of the study. This is the *work* the researcher engages in to demonstrate how theory informs all aspects of the study design. In this design, the researcher develops the theoretical framework before the study is carried out; however, the theoretical framework can be adjusted during the research processes in response to the insights and understandings being developed. For instance, many research questions asked in this study design are broad and open ended (e.g., in a study using sociomateriality theory, a researcher might ask, *What is a resident's experience of interprofessional collaboration in clinical learning environments?*). But as the study develops and insights are generated, the research question might need to be modified to better align with the data that the participants and researcher are cocreating (e.g., realizing that the electronic health record has significant impact on team interactions, the research question might change to ask, *What is a resident's experience of interprofessional collaboration in clinical learning environments as it is negotiated through patients' electronic health records?*).

If using a *theory-informing inductive data analysis* study design, the researcher will wait until data analysis is underway to decide which theory or theories can be used to inform data interpretations. The theoretical framework of the study is, therefore, developed during the data analysis processes (which may include cycles of data collection and analysis). When the theory is selected, that choice may impact several aspects of the study.[25] While the theory is selected only when some (or possibly all) data are in hand, the framework can describe how theory shapes the way the research context is approached, the concepts that underpin the evolving study design, the choice of methodology, the data collection, the interactions with study participants, the analysis processes, and the conclusions drawn (e.g., the theory chosen to inform a study using interviews to explore residents' perception of interprofessional collaboration might highlight the importance of group processes, therefore requiring additional data collection via focus groups to explore group interactions). Not *all* aspects of the study are shaped by theory in the *theory-informing inductive data analysis* study design. Instead, only *some* aspects of the study design are informed by theory. In this design, the theoretical framework offers a description of which elements of the study are theory informed and how they are informed. The researcher thus has to *work* to translate insights from theory into specific contributions to elements of the theoretical framework and of the research design.

How subjectivist inductive researchers use a conceptual framework. In a subjectivist inductive approach, the conceptual framework will likely need to evolve during a study as new ideas, insights, and knowledge are developed. As a result, a researcher will often construct a tentative conceptual framework at the beginning of the study, knowing that it will likely need to be adjusted as data transform the researcher's understanding of the phenomenon. That framework will include a description of relevant literature, a summary of relevant theory (if using *fully theory-informed inductive* or *theory-informing inductive data analysis* study designs), an explanation of why the research should be carried out in the selected context, research question(s), and justification for the research methodology selected.

Conclusion

Our descriptions of *theory*, *theoretical framework*, and *conceptual framework* are simplified. To craft these descriptions, we had to wrestle with the foundational elements of research. Despite this effort, the result remains incomplete, undernuanced, and full of compromises. Indeed, descriptions of the use of *theory*, *theoretical frameworks*, and *conceptual frameworks* are usually written in book—rather than article—form, and we consequently needed to abbreviate and distill philosophical arguments at every turn. We explored the similarities and differences across objectivist deductive approaches and subjectivist inductive approaches. Our descriptions of objectivist deductive and subjectivist inductive approaches are not tied to specific paradigms. Instead, these research approaches can be used across paradigms.[26] Our descriptions should act as guideposts for when and how to engage with *theory*, *theoretical frameworks*, and *conceptual frameworks*. The real work of research is negotiating across these terms when we put them into action in our projects.

In this article, we highlight the transformative *work* that is needed for a theory to appropriately and meaningfully influence research studies that will help deepen our understanding of problems, contexts, and even the theories themselves important to HPE. But, to do this, we need to have a common understanding of the language we use and an appreciation of the different ways these terms can be applied. This language can help us better report the in-depth analytical *work* involved in research—a theoretical frame*work* articulates the logic of why we are using a particular theory; a conceptual frame*work* justifies why this problem/context/phenomenon is relevant to the field. These frameworks represent one of the most challenging aspects of research—turning a hunch, an observation, or a meandering thought into a logical, evidence-informed, theory-refining, impactful, and meaningful argument suitable for peer review and publication.

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References

1 Reeves S, Albert M, Kuper A, Hodges BD. Why use theories in qualitative research? BMJ. 2008;337:a949.
2 Nimmon L, Paradis E, Schrewe B, Mylopoulos M. Integrating theory into qualitative medical education research. J Grad Med Educ. 2016;8:437–438.
3 Kuper A, Whitehead C. The practicality of theory. Acad Med. 2013;88:1594–1595.
4 Davidoff F, Dixon-Woods M, Leviton L, Michie S. Demystifying theory and its use in improvement. BMJ Qual Saf. 2015;24:228–238.
5 Cook DA, Beckman TJ, Bordage G. Quality of reporting of experimental studies in medical education: A systematic review. Med Educ. 2007;41:737–745.
6 Research Grant Awards. AMEE. https://amee.org/awards-prizes/research-grant-award-programme. Accessed October 30, 2019.
7 Durning SJ, Carline JD, eds. Review Criteria for Research Manuscript. 2nd ed. Washington, DC: Association of American Medical Colleges; 2015.
8 Albert M. Understanding the debate on medical education research: A sociological perspective. Acad Med. 2004;79:948–954.
9 Albert M, Hodges B, Regehr G. Research in medical education: Balancing service and science. Adv Health Sci Educ Theory Pract. 2007;12:103–115.
10 Albert M, Paradis E, Kuper A. Interdisciplinary promises versus practices in medicine: The decoupled experiences of social sciences and humanities scholars. Soc Sci Med. 2015;126:17–25.
11 Kerlinger F. Foundations of Behavioral Research. Chicago, IL: Holt, Rinehart & Winston; 1986.
12 Varpio L, Aschenbrener C, Bates J. Tackling wicked problems: How theories of agency can provide new insights. Med Educ. 2017;51:353–365.
13 Grant C, Osanloo A. Understanding, selection, and integrating a theoretical framework in dissertation research: Creating the blueprint for your "house." Adm Issues J: Connect Educ Pract Res. 2014;4:12–26.
14 Maxwell, JA. Qualitative Research Design: An Interactive Approach. 3rd ed. Los Angeles, CA: Sage Publications; 2013
15 Park YS, Konge L, Artino AR Jr. The positivism paradigm of research. Acad Med. 2020;95:690–694.
16 Young M, Ryan A. Post-positivism in health professions education scholarship. Acad Med. 2020;95:695–699.
17 Rees C, Crampton P, Monrouxe V. Re-visioning academic medicine through a constructionist lens. Acad Med. 2020;95:846–850.
18 Paradis E, Nimmon L, Wondimagegn D, Whitehead C. Critical theory: Broadening our thinking to explore the structural factors at play in health professions education. Acad Med. 2020;95:842–845.
19 Creswell JW. The use of theory. In: Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 3rd ed. Los Angeles, CA: Sage Publications; 2009:61–66.
20 Glaser B, Strauss A. The Discovery of Grounded Theory: Strategies for Qualitative Research. Chicago, IL: Aldine Publishing Company; 1967.
21 Stewart D, Klein S. The use of theory in research. Int J Clin Pharm. 2016;38:615–619.
22 Yin RK. Case Study Research: Design and Methods. 2nd ed. Los Angeles, CA: Sage Publications; 1994.
23 Merriam S. Qualitiative Research and Case Study Applications in Education. San Francisco, CA: Jossey-Bass; 1998
24 Lincoln YS, Guba EG. The Constructivist Credo. Walnut Creek, CA: Left Coast Press; 2013.
25 Mertens DM. Research and Evaluation in Education and Psychology: Integrating Diversity With Quantitative, Qualitative, and Mixed Methods. 3rd ed. Los Angeles, CA: Sage Publications; 1998.
26 Young M, Varpio L, Uijtdehaage S, Paradis E. The spectrum of inductive and deductive research approaches using quantitative and qualitative data. Acad Med. 2020;95:1122.