Approaching Research in Different Ways - How to Choose an Appropriate Research Approach/Reasoning During Ph.D. Program in India?

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ABSTRACT

Purpose: *A good description, explanation, and claim about the fact/reality/truth/dependent variable/effect and a piece of complete knowledge about reality are only possible if such a reality is explained using many possible research approaches/reasoning. Owing to such importance the key purpose of this article is to explain the essence of 'research approach/reasoning' and various available research approaches/reasoning in doctoral-level research and recommend an ideal model that would enable Ph.D. scholars in India to carry out doctoral-level research that is aimed at improving knowledge about a reality using different research approaches/reasoning.*

Design/Methodology/Approach: *Postmodernism philosophical paradigm; Inductive research approach; Observation data collection method; Longitudinal data collection time frame; Qualitative data analysis.*

Findings/Result: *As long as the Ph.D. scholars can understand all the available research approaches and make mindful choices of approaches to answer their research question they will be able to determine (on their own) all the other choices in succeeding steps of doctoral-level research such as i) data collection method; ii) data collection time frame; iii) sample size; iv) sampling technique; v) data collection instrument; vi) data analysis techniques.*

Originality/Value: *There is a vast literature about reasoning in research. However, there are only a few stakeholders in the research education system who encourage Ph.D. scholars to choose a research approach/reasoning that is uncommon in a discipline. Through this article, we have attempted to explain the purpose of reasoning in doctoral-level research in addition to recommending a decision framework that enables Ph.D. scholars to choose an appropriate research approach during Ph.D.*

Paper Type: *Conceptual model.*

Keywords: Research Methodology; Research Design; Research Process; PhD; Ph.D.; Coursework; Doctoral Research; Research Approach; Deductive Approach; Inductive Approach; Abductive Approach; Reasoning; Deductive Reasoning; Inductive Reasoning; Abductive Reasoning; Deductivism; Inductivism; Abductivism; Postmodernism

1. BACKGROUND :

Scholarly and scientific doctoral-level research demands researchers to use logic while finding answers to the research question formulated by them. To find the truth, the reasoning is essential, and it is the ability to deliberately use logic by making inferences from data, whether new or old. Reasoning is frequently regarded as a defining trait of humans and is intimately related to uniquely human pursuits, such as philosophy, science, language, mathematics, and art. Rationality and reasoning are sometimes used interchangeably. Thinking and cognition are also related to reasoning, which requires using one's

intellect. The study of logic focuses on how people can construct logically sound arguments using formal reasoning. There are several logical reasoning subtypes, including deductive reasoning, inductive reasoning, and abductive reasoning. Aristotle distinguished between logical discursive reasoning and intuitive reasoning because the latter, while nevertheless acceptable, may tend to be subjectively opaque and personal. In some social and political circumstances, logical and intuitive ways of reasoning might collide, whereas, in others, they are considered complementary rather than competing. For instance, intuition is frequently required in mathematics for the creative processes involved in arriving at a formal proof, arguably the most challenging of all formal reasoning tasks. One of the ways that thinking transitions from one thought to a related idea is through reasoning, much like habit or intuition. For instance, the reasoning is the process by which sensible people make sense of sensory data from their surroundings or comprehend concepts like cause and effect, truth and falsity, or beliefs about concepts of good or evil.

Various research studies have identified factors affecting the Ph.D. success rate across the world. "To name a few a) scholar-supervisor/guide relationship; b) mentorship; c) dissertation process; d) role of the department; e) role of peer qualities; f) transformational learning experience provided; g) level of curiosity and interest in reviewing the existing literature; h) planning and time management skills; i) level of creative thinking and writing skills; j) amount of freedom in the research project; k) level of a supportive environment for Ph.D. scholars' well-being; l) higher-education practices; m) supervisors' research capabilities and gender; n) expectations set by the research environment; o) Ph.D. scholars' expectations; p) support network; q) level of Ph.D. scholars' socialization with the research community; r) Ph.D. scholars' navigation system; s) different terminologies for various components of doctoral-level research are given by different disciplines creating undue confusion in scholars' minds; t) data collection methods which just play the role of data collection and it is just one of the steps of the doctoral-level research process being portrayed as the research methodology/design; u) scholars' inability to identify their genuine interest in a fact/phenomenon/reality/truth/dependent variable, intensive review of existing literature, locating an important research gap, and finally formulating a research question; v) a lower level of clarity about the most important and indispensable step of the doctoral-level research process i.e., choosing an appropriate research philosophical paradigm that lays stepping stones toward answering the research question in a scientific and scholarly way" [1-50].

Furthermore, in reality, a majority of stakeholders in the research education system have a lower level of clarity about the most important and indispensable step of the doctoral-level research process i.e., choosing an appropriate research approach that lays stepping stones toward logically answering the research question. In addition to this lower clarity, a majority of them guide the Ph.D. scholars to begin the journey without educating the scholars about the essence of research approaches/reasoning. In addition, they also mandate that scholars use certain research approaches that are commonly used in a discipline or the one with which they are comfortable. This lower level of clarity and the beginning of the Ph.D. journey without a clear understanding of the research approaches is making it difficult for Ph.D. scholars to complete the journey successfully and most importantly if some scholars complete their Ph.D. journey successfully, their awareness about the research approach/reasoning chosen to answer their research question is very low. We believe that if the scholars can begin their Ph.D. journey by allocating a higher level of focus and time toward understanding various research approaches/reasoning available and choose the one that is appropriate their journey will be with a very lower level of complications and with a higher level of awareness about the essence of reasoning in doctoral-level research. But this reality is knowingly or unknowingly, intentionally, or unintentionally suppressed by a majority of stakeholders in the research education system in India. In other words, this *suppressed reality* has resulted in creating humungous confusion about which is an appropriate research approach during Ph.D. among scholars in India.

One thing Ph.D. scholars must always remind themselves of throughout their Ph.D. journey is the fact that they will be awarded a Ph.D. degree for doing doctoral-level research. Doing doctoral-level research and generating research outputs such as research articles and a thesis determines the probability of success in getting a Ph.D. degree. The first step of the doctoral-level research process is identifying research gaps and formulating a research question, the second one is choosing an appropriate research philosophical paradigm and the third step is choosing an appropriate research approach/reasoning that acts as a stepping stone for finding an appropriate data collection process to answer the research question logically. It is thus inevitable and imperative that Ph.D. scholars understand various research

approaches/reasoning in depth and chose one that is appropriate before starting the data collection process in their Ph.D. journey. The doctoral-level research which is the single most important requirement of the Ph.D. program is cognitively demanding and intends to create researchers who can create new knowledge or interpret existing knowledge about reality by using different perspectives, paradigms, and reasoning. Knowledge sharing requires autonomy, good quality time, a stress-free brain for deep thinking, and the freedom to look for more meaningful findings. This is the single most important reason for making doctoral-level research flexible wherein the scientific and scholarly world gives autonomy to Ph.D. scholars to formulate their question and answer it within 3-6 years using an appropriate research approach/reasoning. Nevertheless, only 50% of scholars admitted to Ph.D. in India completed, and that too in ten years whether or not they are aware of the importance of reasoning in doctoral-level research [46-50].

2. OBJECTIVE :

Deductive thinking is a challenge that affects many different areas and problems. In the course of deductive reasoning, epistemology seeks to comprehend how justification is moved from belief in the premises to belief in the conclusion. Probability logic investigates how the likelihood of an inference's premises influences the likelihood of its conclusion. There are no other valid modes of inference than deduction, according to the contentious/debatable deductivism theory. We believe that deductive reasoning requires lesser time to research as compared to other available reasoning types and this is one of the most important reasons deductivism is being widely followed by researchers in India even after the Ph.D. program. However, a good description, explanation, and claim about the fact /reality/truth/dependent variable/effect and a piece of complete knowledge about reality are only possible if such a reality is explained using many possible research approaches/reasoning. *Owing to such importance the key objective of this article is to explain the essence of 'research approach/reasoning' and various available research approaches/reasoning in doctoral-level research and recommend an ideal model that would enable Ph.D. scholars in India to carry out doctoral-level research that is aimed at improving knowledge about a reality using different research approaches/reasoning*.

3. WHAT IS THE RESEARCH APPROACH? :

The research approach is a way of reasoning about the relationship between dependent and independent variables of the research question formulated by scholars in the first step of the doctoral-level research process. Reasoning, on the other hand, is limited to the conscious production of thought with the use of logic, it is the act of moving toward an understanding of the relationship between dependent and independent variables of a research question. The research approach is also about deciding whether to i) build/construct a new theory about a relationship; ii) test/verify an existing theory about a relationship; iii) deconstruct/modify/rationalize a theory about the relationship. "*A theory is a symbolic Construction [51]. It will be convenient for our purposes to define a theory simply as a set of statements or sentences [52]." "Basically, a theory consists of one or more functional statements or propositions that treat the relationship of variables so as to account for a phenomenon or set of phenomena [53]." "A theory is a set of statements about the relationship(s) between two or more concepts or constructs [54]."*
Many of us think that theory is bookish and not practicable/practical. Ph.D. scholars must not have this opinion or predisposition in their minds. This confusion is because a majority of stakeholders in the research system are using the term theory as a synonym for hypothesis and a majority of common people are using the term theory as a synonym for the assumption. Figure 1 illustrates the difference between Observed 'Fact' *(a propositional observation about the reality/phenomenon/dependent variable),* 'Hypothesis' *(a possible explanation for the fact observed),* 'Theory' *(a hypothesis that has been tested enough times that we can make a general rule that accounts for the fact),* and 'Model' *(theories in aggregate. Once we have a bunch of theories that all agree with one another we can construct practicable models)*. Only through continuous and consistent efforts, researchers can build a Model that works! In real-life context.

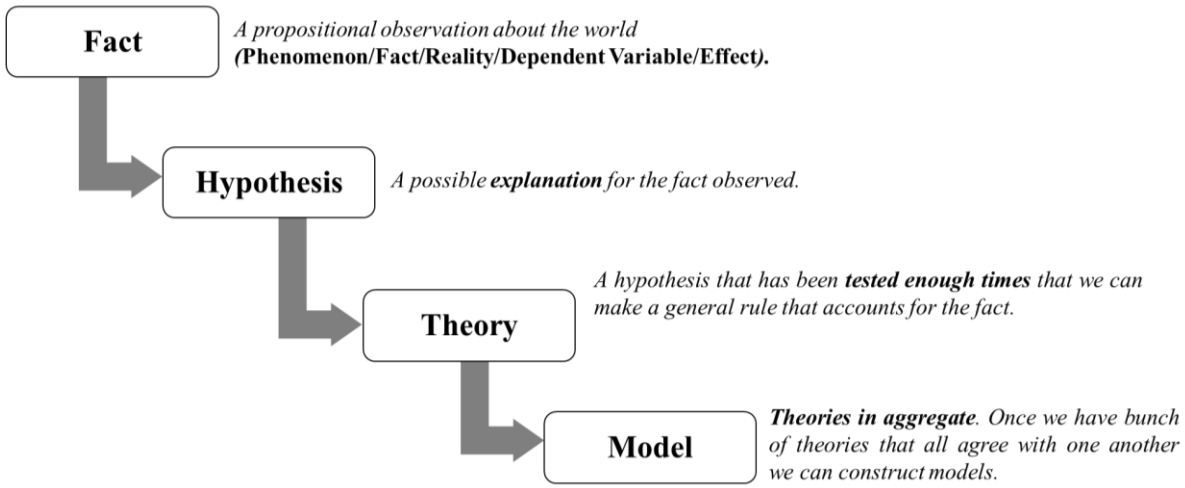

Fig. 1: Journey of research from observation to building a model [54]

We must not think that a theory is something very complicated. The theory is just stating the relationship between dependent and independent variables limited to a context and population/units of analysis. We have listed below a few known theories across many disciplines to help scholars understand that theory is not a complicated terminology.

- **Marketing:** Higher the customer retention rate (independent variable) higher the profit (dependent variable).
- **Finance:** Higher the quick ratio (independent variable) healthier the balance sheet (dependent variable).
- **Education:** Higher the rehearsal rate (independent variable) higher the level of learning (dependent variable).
- **Computer Science:** Higher the ram storage capacity (independent variable) better the computer performance (dependent variable).
- **Basic Science:** Every action (independent variable) has an equal and opposite reaction (dependent variable).
- **Physiotherapy:** Physiotherapy (independent variable) has a positive impact on pain relief (dependent variable).
- **Nursing:** Interpersonal skills (independent variable) in the nurse-client relationship (dependent variable) are the foundation of nursing practice.
- **Health Science:** Higher the BMI (independent variable) higher the risk of obesity (dependent variable).
- **Sociology:** Learning (dependent variable) occurs by observing others (independent variable 1) and modeling their behavior (independent variable 2).
- **Psychology:** Human behavior (dependent variable) develops through experience (independent variable).
- **Language:** Language learning (dependent variable) grows out of a process of reinforcement (independent variable 1) and punishment (independent variable 2).

The research philosophical paradigm scholar has chosen immediately after formulating the research question is the key driver for choosing a research approach in step 3 of the doctoral-level research process [46-50] [55-82]. As the research philosophical paradigm chosen in step 2 is the key driver for the selection of a research approach, the connection between the research philosophical paradigm and the research approach must be understood by the Ph.D. scholars which is listed below.

- **Positivism:** Testing/verifying an existing theory about the relationship between dependent and independent variables.
- **Interpretivism**: Building/constructing a new theory about the relationship between dependent and independent variables.
- **Critical Realism:** Modifying an existing theory about the relationship between dependent and independent variables.
- **Postmodernism:** Deconstructing an existing theory about the relationship between dependent and independent variables.

- **Pragmatism:** Building, testing, and rationalizing a new theory about the relationship between dependent and independent variables.

4. TYPES OF RESEARCH APPROACH :

There are three main types of research approaches viz., i) Deductive approach/reasoning, ii) Inductive approach/reasoning, and iii) Abductive approach/reasoning. We strongly suggest scholars recall their understanding of research philosophical paradigms while reading these three types of research approaches as they are seamlessly connected.

4.1. Deductive Approach/Reasoning (General to Specific):

A deductive research approach is appropriate for testing/verifying an existing theory about the relationship between your dependent and independent variables of scholars' research questions. If scholars have stated a set of hypotheses (logical assumptions) while formulating their research question that needs to be confirmed or rejected during the research process they would be following a deductive research approach/reasoning [56] [83-94]. A typical flow of research events for the deductive research approach/reasoning is illustrated in figure 2.

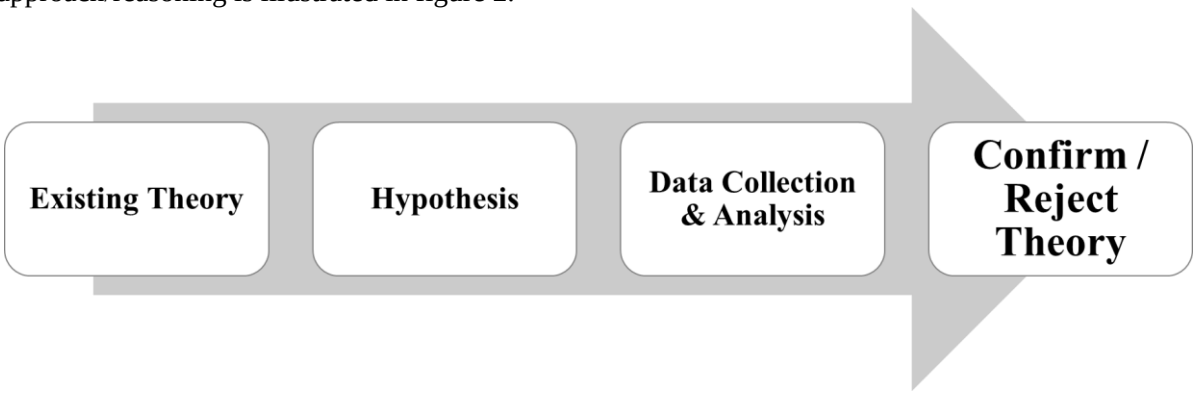

Fig. 2: Flow of deductive research approach

Let us look at an example. Assume that we have finalized the dependent variable as 'Sales Quantity' and the independent variable as 'Discount' for the unit of analysis 'Brick-and-Mortal Retail Store'. *'Higher the Discount on a product higher the Sales Quantity'* is an existing theory. If we are interested in testing/verifying this theory the best choice of research approach/reasoning is a deductive research approach. The flow/order of the research process would look as shown below.

- Creating hypotheses (logical assumption)
  - Null hypothesis: There is no relationship between discount and sales quantity.
  - Alternative/research hypothesis 1: There is a positive relationship between discount and sales quantity.
  - Alternative/research hypothesis 2: There is a negative relationship between discount and sales quantity.
- Selecting a retail store.
- Collecting sales quantity data for with-discount and without-discount periods.
- Comparing pre- and post-discount period sales quantity data and analyzing whether there is any change in sales quantity in the presence and absence of a discount.
- Accepting or rejecting the theory based on the results of the analysis.

4.2. Inductive Approach/Reasoning (Specific to General) :

The inductive research approach is appropriate when building/constructing a new theory about the relationship between dependent and independent variables of a research question [56] [95-105]. The inductive research approach *does not* involve the formulation of hypotheses while formulating the research question. It starts with research questions, aims, and objectives that need to be achieved during the research process beginning with data collection. A typical flow of research events for the inductive research approach/reasoning is illustrated in figure 3.

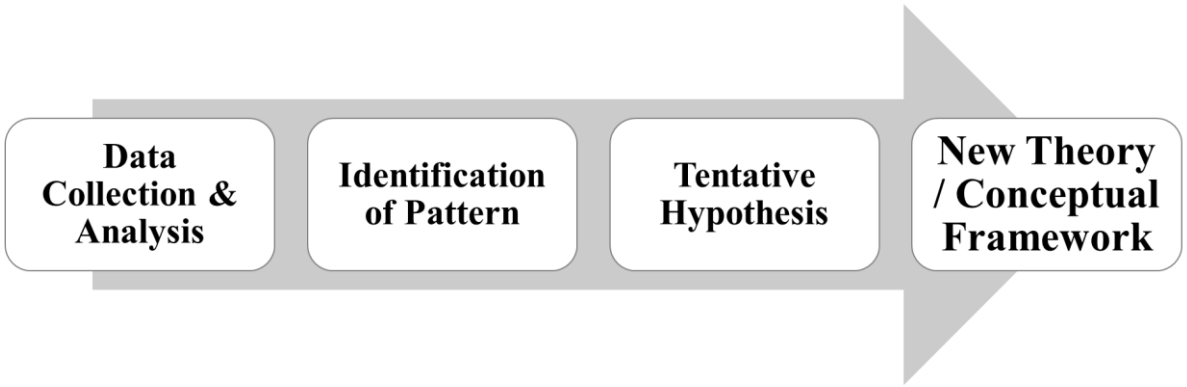

Fig. 3: Flow of inductive research approach/reasoning

Let us look at the same example discussed in the deductive research approach/reasoning. Assume that we have finalized the dependent variable as 'Sales Quantity' and the independent variable as 'Discount' for the unit of analysis 'Brick-and-Mortal Retail Store'. As we aim to build a new theory around these variables of the research question the best choice of research approach/reasoning is an inductive research approach/reasoning. The flow/order of research would look as shown below.

- Selecting a Retail Store.
- Observing and recording the sales quantity and discount data for a select period.
- Reviewing existing literature about variables.
- Understanding changes in sales quantity with and without discount and comparing the same with existing literature.
- Developing a tentative hypothesis and building a Conceptual Framework/Theory/Model based on the difference between observation and existing literature.

4.3. Abductive Approach/Reasoning (Incomplete to Best Possible Prediction) :

The Abductive research approach is appropriate when building/constructing a new rationalized theory or deconstructing/modifying/rationalizing an existing theory about the relationship between dependent and independent variables of a research question [56] [106-124]. The abductive research approach does not involve the formulation of hypotheses while formulating the research question. The goal of an abductive research process is to explain the "incomplete observations," "unusual facts," or "mysteries" that were stated at the start of the investigation but are not addressed by the current theory. Additionally, it entails investigating a phenomenon related to the dependent variable, uncovering themes and patterns, placing them in a conceptual framework, and then validating that framework by further data collection, etc. A typical flow of research events for an abductive research approach is illustrated in figure 4.

Let us look at the same example discussed in the deductive and inductive research approaches. Assume that we have finalized the dependent variable as 'Sales Quantity' and the independent variable as 'Discount' for the unit of analysis 'Brick-and-Mortal Retail Store'. As we aim to build a new but rationalized theory around these variables of research the best choice of research approach/reasoning is an abductive research approach/reasoning. The flow/order of research would look as shown below [125-129].

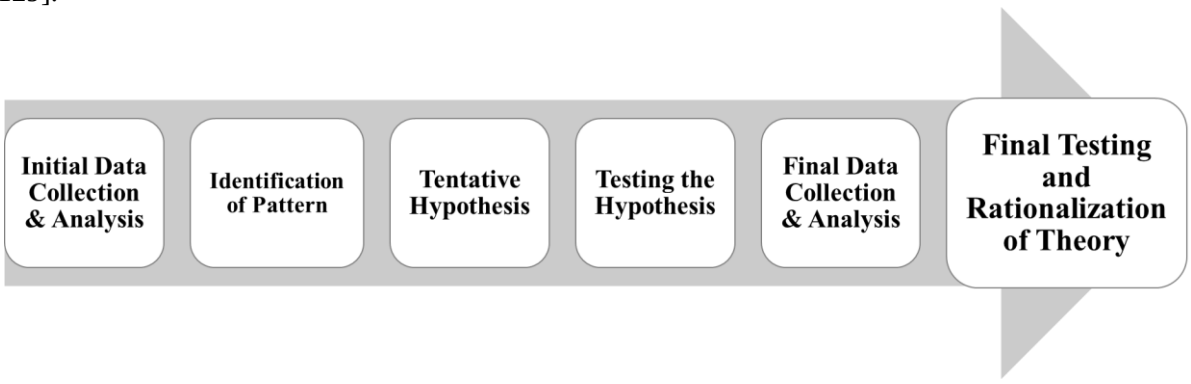

Fig. 4: Flow of abductive research approach/reasoning

- Reviewing existing theories and identifying anomalies (unanswered/unexplained).
- Selecting a Retail Store.

- Observing and recording the sales quantity data for a specific period.
- Understanding change in sales quantity.
- Developing a tentative hypothesis.
- Developing a conceptual framework/theory.
- Testing the new conceptual framework/theory through intervention/experiment (applying different levels and types of discounts).
- Observing and recording a change in sales quantity post-intervention/experiment.
- Modifying/correcting/revising the initial conceptual framework/theory.
- Once again testing the modified/corrected/revised framework/theory through another intervention/experiment.
- Observing and recording a change in sales quantity post-second intervention/experiment.
- Rationalizing the theory.

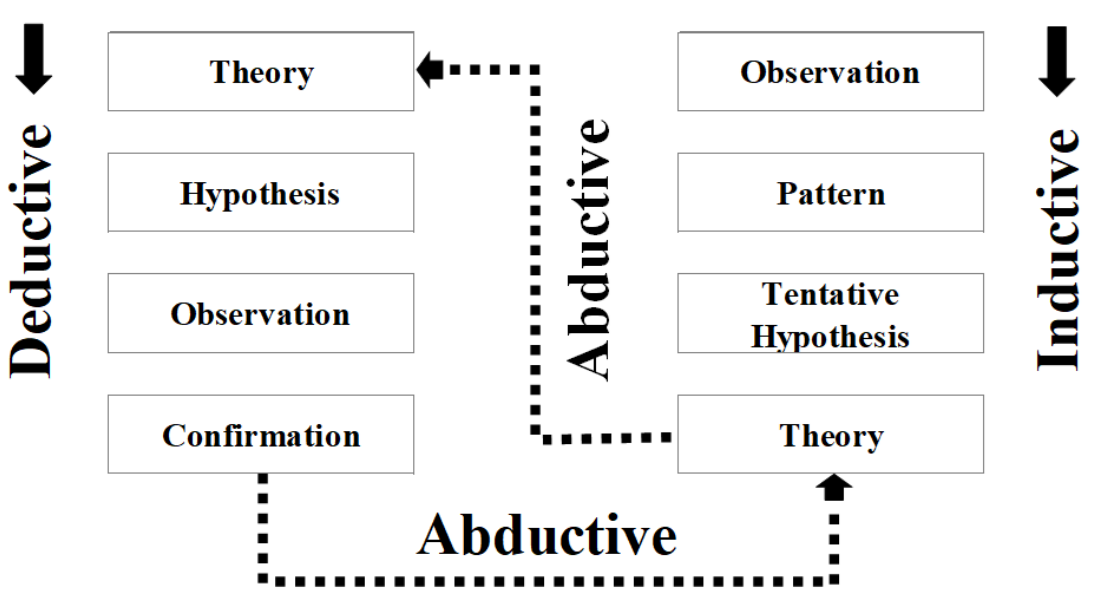

Fig. 5: Comparative flow of events across research three research approaches/reasoning

Figure 5 illustrates a comparison of all three research approaches. In summary deductive research approach is testing an existing theory; the inductive research approach is building a new theory; the abductive research approach is testing and rationalizing a newly built theory.

5. CHOOSING A RESEARCH APPROACH :

Among all the three research approaches the less time-consuming and easy approach is the deductive research approach/reasoning as we are not required to build a new theory. The inductive approach requires patience, a review of the existing literature with an open mindset, and good quality time. The Abductive research approach requires a higher level of awareness concerning the existing status of knowledge about a reality/dependent variable vis-à-vis the ideal status of the knowledge. In addition, the abductive approach requires continuous and focused research about a single reality/dependent variable/fact for a longer period until the researcher can build a model that works. Furthermore, to become a complete and seasoned researcher it is inevitable and imperative to use all three research approaches according to the appropriateness and the phase of research about a select reality/dependent variable/fact throughout the research career. If we take a look at some of the seasoned researchers around the globe, we might realize that they have spent/devoted their entire research career toward understanding just one reality/dependent variable/fact.

A majority of Ph.D. scholars in India have difficulties in choosing an appropriate research approach during their Ph.D. journey. Nevertheless, in figure 6 we have attempted to recommend a decision framework for Ph.D. scholars to help them choose an appropriate research approach based on two important components such as A) ‘The level of autonomy given to them by the research environment and system’ and B) ‘How much time the Ph.D. scholars can devote for research during their Ph.D. journey.

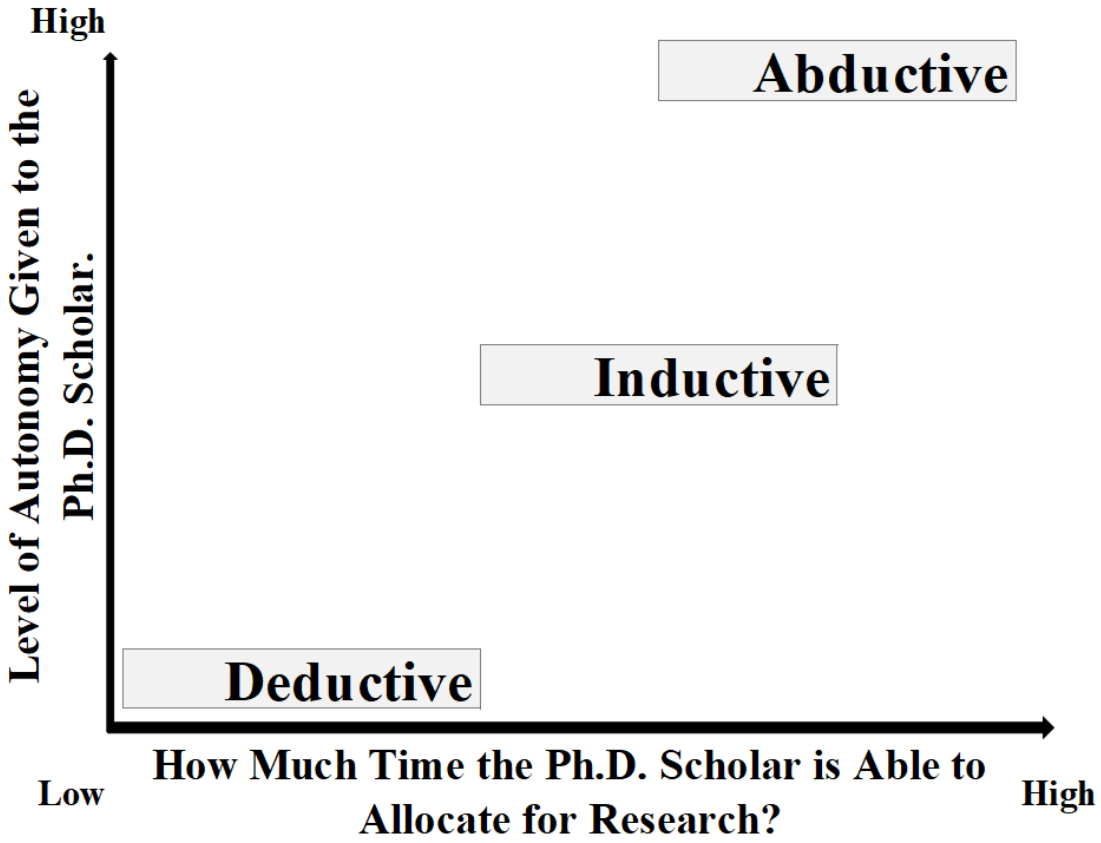

Fig. 6: A decision framework for choosing an appropriate research approach

Our decision framework recommends i) Deductive approach if both 'A' and 'B' are low; ii) Inductive approach if both 'A' and 'B' are medium; iii) Abductive approach if both 'A' and 'B' are high. However, if delivering a high-quality research output is the key objective of a Ph.D. scholar, it is recommended to use the abductive research approach wherein the scholar uses an inductive approach to introduce a conceptual theory based on an in-depth literature review; uses a deductive approach to test own conceptual theory; evaluates the deductive results to modify/revise tested theory; once again uses an inductive approach to build a rationalized theory; once again uses the deductive approach to test the renationalized theory.

6. CONCLUSION :

Among all the three research approaches/reasoning types the less time-consuming and easy approach is the deductive research approach/reasoning as we are not required to build a new theory. We understand the Ph.D. program is time-bound and hence using the deductive research approach during the Ph.D. program is acceptable. But knowingly or unknowingly, intentionally, or intentionally a significant majority of researchers in India use the deductive research approach even after the completion of the Ph.D. program. The fear among Indian researchers is that inductive and abductive research approaches require a lot of time investment and most importantly the research output in the form of research article publications will slow down drastically. The mere pressure on Ph.D. scholars and Ph.D. holders in India to publish a certain number of research articles which is connected to their performance measurement is also one of the key reasons for avoiding inductive and abductive research approaches. However, there are a few Institutes in India that motivate their Ph.D. and Post-doc researchers to take up inductive and abductive research approaches. Ph.D. scholars and Ph.D. holders must be aware that most referred (citations) research works are the ones that have used inductive and abductive research approaches. Any research output that is a result of the inductive research approach automatically prompts other researchers to use the deductive research approach to test/verify a newly inducted theory which otherwise by default encourages researchers to read and refer to the inductive research works. Furthermore, abductive research works are the most preferred research output by the end-users of

research output (models that work in the field).

It is the responsibility of every stakeholder in the research environment and system to ensure that the scholars are made aware of every step involved in carrying out doctoral-level research in addition to the importance of various research approaches available for them to choose to achieve their key research objective during the Ph.D. journey. Designing robust coursework that is intended to create awareness about the essence of logical reasoning/research approaches in doctoral-level research is an appropriate way of fulfilling this responsibility. As long as the Ph.D. scholars can understand all the available research approaches and make mindful choices of approaches to answer their research question they will be able to determine (on their own) all the other choices in succeeding steps of doctoral-level research such as i) data collection method; ii) data collection time frame; iii) sample size; iv) sampling technique; v) data collection instrument; vi) data analysis techniques.

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