# Philosophical Thinking:A Guiding Role in Research

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## Abstract

This research paper deals with one central question as to how our philosophical assumptions guide our research. The paper starts by explaining key words in educational research and educational research philosophy: paradigm, ontology, epistemology and methodology. It is crucial to the discussion of ontology, epistemology and methodology to show how these three terms are very closely related. Within the realm of ontology, two philosophical schools are recognized: objectivism and constructivism. Under the epistemological umbrella, two philosophical concepts are noticed: positivism and interpretivism (Marsh & Furlong, 2010). Normally, objectivist researchers, represented by Auguste Comte (Cohen, Manion, & Morrison, 2011), tend to behave in a positivist way. On the other hand, constructivist researchers, represented by Kant and Hegel, Marx and Engels - specifically Theses on Feuerbach and The German Ideology, and Vygotsky (Lantolf & Thorne, 2006), usually follow an interpretative epistemological path. However, the case is not that simple!

## 1. Introduction

In this paper, qualitative and quantitative research methods are compared and contrasted. But prior to that, the term *paradigm* is introduced and the philosophical concepts that underpin it - namely ontology, epistemology and methodology - are uncovered. After that, an experimental example is supplied. Such an example shows how such philosophical research underpinnings (i.e. ontology and epistemology) guide the research and directly influence the methodology adopted.

**The Term Paradigm: The Role of the Philosopher Thomas Kuhn**

Having Faced difficulty understanding Aristotle's account of the physical world, Thomas Kuhn - though experienced in 20th century physics - coined the term paradigm in the 1960s (Hammersley, 2007; Scott & Morrison, 2007). This difficulty urged him to study the natural science in depth, from a different angle, and consult the work of other scholars who were also unconvinced of the Greek philosopher's explanations of the physical world. His investigation resulted in his call for the establishment of an alternative paradigm: a paradigm taking into account the social aspect of the natural science (Hammersley, 2007; Kuhn, 1970). Kuhn (1970) believed that the old paradigm (which was called positivism as represented by the scientific movement) and his new paradigm (often attached to interpretivism) are incompatible (Hammersley, 2007; Kuhn, 1970). However, a new paradigm – called mixed methods research paradigm – has recently emerged whose proponents (such as Johnson and Onwuegbuzie, 2004; Denscombe *et al.*, 2008) argued that the commensurability of the positivist and interpretivist paradigms is possible (Cohen *et al.*, 2011).

The paradigm represents "a fixed body of knowledge and a particular belief system". It is in fact a way in which we look at the world (Tobin & Kincheloe, 2006, p. 102). It is based upon three – very closely related – philosophical assumptions: ontology, epistemology and methodology (Cohen *et al.*, 2011, Hammersley, 2007, Guba & Lincoln, 1994). It is useful in this context to supply a brief account with regards to the origin of *paradigm* and Thomas Kuhn Role in its coining. As has been clearly stated, the paradigm is composed of three interrelated components: ontology, epistemology and methodology. Below is an account of these philosophical terms.

## 2. Mainstream Philosophy: Ontology, Epistemology and Methodology

### 2.1. Ontology: The Foundational Level

This first philosophical level is represented by ontology. Ontology is defined as the "theory of being" (Marsh & Furlong, 2010, p.185). It is the start of the research, that is followed logically by one' s epistemological and methodological stances (Grix, 2002). This philosophical concept is concerned with the researcher's belief s about the nature of reality or social phenomenon (Cohen *et al.*, 2011;

Paul & Marfo, 2001; Allison & Pomeroy, 2000; Tudge, 2000; Guba & Lincoln, 1994). This philosophical level, objectivists and constructivists are recognized.

Objectivists are those researchers who believe in the availability of an objective reality that is independent of the researcher. They also believe that this reality can be discovered, measured, reduced to numbers and replicable (Cohen *et al.*, 2011; Hammersley, 2007; Grix, 2002; Guba & Lincoln, 1994). Constructivists, on the other hand, are those who maintain that reality is "multiple", something relative, abstract and socially constructed (Ates, Coban, & Sengoren, 2017); Cohen, et al, 2011; Marsh and Furlong, 2010; Hammersley, 2007; Grix, 2002; Guba and Lincoln, 1994). Marsh and Furlong (2010) provide an explain which clearly explains these two positions.

Examining Men Are from Mars Women Are from Venus (Gray, 2002), it can be recognized that this book provides and objectivist ontological position. In this book, the author argues that men are completely different from women. The difference - that he maintains - is "essential" and thus has nothing to do with time and place. In other words, men are different from women in "features of their very existence" (i.e. ontologically different). On the other hand, feminists believe that there are no "essential" difference between men and women. They are of the view that their difference is but a cultural construct. Thus, they can be looked upon as holding a constructivist ontological position (Marsh & Furlong, 2002, p. 18). However, Pring (2000) holds that the philosophical assumptions underpinning social research have been misunderstood by a number of researchers. Therefore, he disagrees with constructivists and maintains that as there is a tangible reality in the physical world, there does exist a social reality. Weber (2004) also appears to be sure of the existence of some (social) reality that is beyond our perceptions.

Having discussed the first philosophical level, it is now high time to move on to the second philosophical level – i.e. epistemology.

**2.2. Epistemology: The Information level**

This second level is related to epistemology – i.e. information! Literally, epistemology is the "theory of knowledge" (Marsh & Furlong, 2010, p.185, Bartlett & Burton, 2007, p. 77). It is concerned with the researcher's way of looking at knowledge within reality (Allison & Pomeroy, 2000). Epistemology is concerned with two issues: The first is related to the question as to how certain we are about our research conclusions; the second concerns the question as to whether or not our research findings can be generalized (Hay, 2002). Positivism and interpritivism are noticed at this philosophical level (that is concerned with knowledge).

Positivism is "the belief that all true knowledge is based on observable phenomenon" (Wellington, 2000, p. 199). As such, positivists (such as Henri de Saint- Simon, Pierre-Simon Laplace, and Auguste Comte) consider their findings as being facts, laws and true and as having the potential to be generalized (Guba & Lincoln, 1994). They also place a lot of emphasis on the objective state of the researcher (Carson *et al.*, 2000). According to them, the social researcher should treat social phenomena the same way scientist treat physical entities – such as atoms and chemicals (Bartlett & Burton, 2007; Hammersley, 2007). Interpretivism, on the other hand, is the philosophical stance considering knowledge as gained through the interpretation that the researcher (and the research participants) make(s) of the data (Bartlett & Burton, 2007). This means that the researcher is not objective in their research but rather is "part of the research instrument" (Carson *et al.*, 2000, p. 13). It has to be noted in this respect that the researcher's interpretation of the data is neither facts, nor laws nor true; it is, rather, just an opinion – a mere point of view. Therefore, research findings cannot be generalized (Bartlett & Burton, 2007). However, some theorists and researchers disagree with this account.

It has been stated at the outset of this paper that that ontology, epistemology and methodology are closely connected. In what follows, it will be shown how ontology impacts epistemology!

**Epistemology Influenced by Ontology**

Ontology, as noted above, affects epistemology. Objectivists (researchers looking at social phenomenon – i.e. reality – as something physically available) normally hold a positivist epistemological stance: that research should be conducted objectively and that research findings – i.e. knowledge- are facts, laws and true. The Swiss psychologist Piaget as an illustrative example:

> Piaget is an objectivist. This is due to the fact that he studied children's behavior (which is a social phenomenon) experimentally (Bartlett & Burton, 2007). That is, he studied behavior in a way analogous to physical entities. It is stated (Bartlett & Burton, 2007) that his objective ontological views towards children's behavior led him to adopt a positivist epistemological point of view. According to him, behavior can be measured through observing how certain variables could have an influence on it (i.e. behavior)! As a positivist, Piaget, along with other positivist researchers (e.g. Comte), look upon his findings as something true, on account that these findings have nothing to do with his opinion and that they can be replicated by researchers working on similar cases in similar contexts. On the other hand, constructivists (researchers believing that social phenomenon is relative -e.g. Dewey, Bruner and Vygotsky) often embrace an interpretivist epistemological stance.

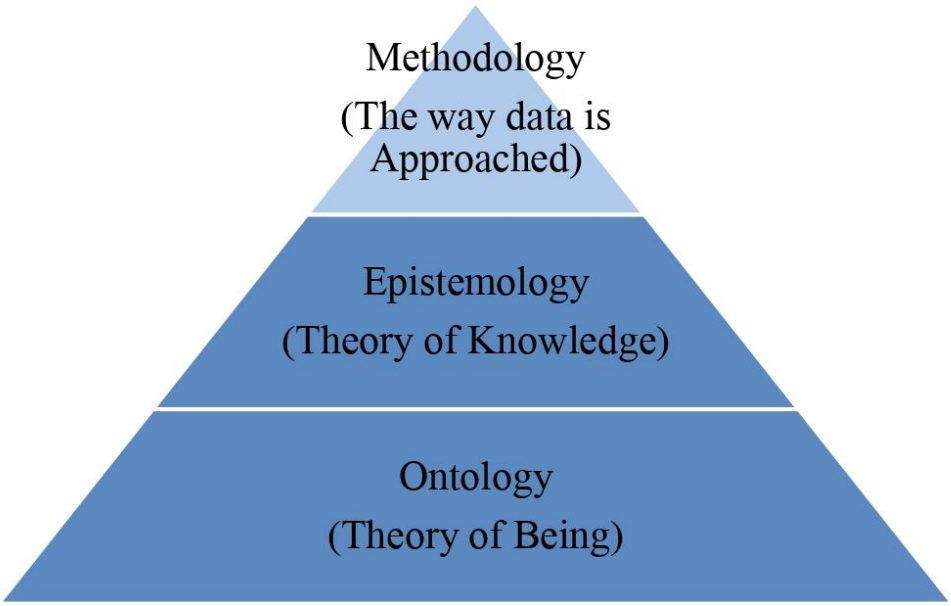
As such, they consider their findings as being only a point of view. So, because they believe that social reality is multiple, there is no single interpretation of it (Cohen et al, 2011; Marsh and Furlong, 2010; Hammersly, 2007; Willis, 2007; Grix, 2002). However, Hay (2002) states that "one's ontology is not reducible to one's epistemology" (p. 67). In other words, researchers adopting an objectivist ontological position do not always need to follow positivist epistemological stances (Marsh & Stoker, 2010; Marsh & Stoker, 2002; Grix, 2002).

That said, it is time to turn to methodology – the most recognizable level of the paradigm – and show how methodological practices are informed by epistemological assumptions.

**2.3. Methodology: The Most Recognizable Level**

This third level is the most noticeable one! Methodology can be defined as the process "of choosing, reflecting upon, evaluating and justifying the methods" used (Wellington, 2000, p. 22). Because it is logically related to research methods, methodology is so often confused with methods (Grix, 2000, p. 179). Methods are defined as techniques or tools researchers adopt to collect (Clough and Nutbrown, 2007) and analyze their data (Blaikie, 2000). In social science research, there are two main methods of data collection: Qualitative and quantitative research methods (Cresswell, 2009). It should be pointed out here that mixed methods research has recently emerged and is widely recognized (Cohen et al, 2011; Denscombe et al, 2008; Johnson and Onwuegbuzie, 2004).

Diagram (1) below shows these three philosophical assumptions about research. The top – i.e. methodology - is shown in a slightly light color! This is to indicate that it is the only part that is appears to light!



Closely related to methodology is the discussion of quantitative, qualitative and mixed methods research. Therefore, they are discussed in the section to follow.

### 2.3.1. Quantitative Research

Quantitative research works in a deductive way (Leydens, Moskal and Pavelich, 2004). This means that quantitative researchers start their research with a hypothesis and aim at testing it – i.e. checking whether it is true or false (Bartlett and Burton, 2007; Carson et al, 2001). Because they are interested in "counts and measures of things", as Berg (2009, p.3) stated, and in making generalizations, as Cohen el al, (2011) and Mahoney and Goertz, (2006) argued, they use such data collection methods as surveys and structured interviews (Cohen et al, 2011; Creswell, 2009). In such a deductive quantitative process, data analysis phase will not start until all data have been gathered (Leydens et al, 2004). The quality of quantitative research is judged by validity and reliability of data (Bartlett and Burton, 2007).

#### 2.3.1.1. Validity

Validity is "a demonstration that a particular instrument... measures what it purports to measure" (Cohen et al, 2011, p. 179). According to Bartlett and Burton, (2007), Validity points to three important aspects in the quantitative research: accuracy, correctness, and truthfulness of the data. It has also to be noted here that it is impossible to achieve a perfectly valid research; that is why quantitative research does possess an inbuilt measure of a standard error that should be reported (Cohen et al, 2011). Reliability, on the other hand, is an assessment of method consistency (Bartlett and Burton, 2007, p. 44). Quantitative researchers are very much concerned with reliability; this is because they are normally conducting a large scale research. However, certain criticism has been leveled at the quantitative research. For example, it has been argued that quantitative research cannot provide depth for the research data (Cohen et al, 2007; Bartlett and Burton, 2007). In addition the research process is not completely objective (Bartlett and Burton, 2007; Johnson and Onwuegbuzie, 2004).

#### 2.3.1.2. Reliability

Quantitative research - contrary to the qualitative one - operates inductively. That is to say, researchers do not begin their research with a hypothesis; rather, their theory emerges from the data they collect (Cohen et al, 2011; Bartlett and Burton, 2007; Scott and Morrison, 2006). Such a research is called theory grounded – a type of research in which theory is grounded in the data (Baikie, 2010)! According to Berg (2009), qualitative researchers often refer to "the meanings, concepts, definitions, characteristics, metaphors, symbols, and description of things"). Their aim is

to deeply understand the social phenomena (Cohen et al, 200111; Bartlett and Burton, 2007; Mahoney and Goertz, 2006). To achieve this aim, they adopt such methods of data collection as observations, unstructured interviews and document [text] analysis (Cohen et al, 2011; Creswell, 2009).

### 2.3.2. Qualitative Research

Qualitative research, rather than judged by validity and reliability, is evaluated through such measures as trustworthiness and authenticity (Brown et al, 2002; Wellington, 2000; Lincoln and Guba, 1994).

#### 2.3.2.1. Trustworthiness

Trustworthiness is a term introduced by Lincoln and Guba (1985). A qualitative research study is said to be trustworthy when it is ethically conducted (Padgett, 2009) and when its findings depict accurately "the settings and events, participants' perspectives, or content of documents" (Leydens et al, 2004, p. 67). Trustworthiness is composed of four constituents: credibility, transferability, dependability and confirmability (Brown et al, 2002; Wellington, 2000; Lincoln and Guba, 1985). It can be achieved through employing various methods of data collection and data analysis (Leydens et al, 2004).

#### 2.3.2.2. Authenticity

Holloway (1997) states that authenticity is achieved when "the strategies used are appropriate for the true reporting of the participants' ideas". It is composed of the following five components: fairness, ontological authenticity, educative authenticity, catalytic authenticity and tactical authenticity (Holloway, 1997). However, like quantitative research, qualitative research – more specifically the process of data interpretation – has been criticized. For example, being so specific to a single case (or a few cases), qualitative research findings cannot be generalized. Thus, it was argued that the findings could neither be of use to the teachers who aim to improve their practices, nor to policy makers who aim to develop a certain educational policy (Cohen *et al.*, 2011)! There are also claims that qualitative researchers usually impose their own opinions in the process of data interpretation (Cohen et al, 2011; Scott & Morrison, 2006).

The following section will answer the question as to how would epistemological assumptions determine the methodology employed.

**Epistemology Determines Methodology**

Researchers with positivist beliefs (e.g. Comte and Piaget) would normally use quantitative methods in order to quantify the researched phenomenon, be it physical or social. On the other

hand, those embracing interpretivist beliefs (e.g. Vygotsky) would usually employ qualitative methods which allow them to understand the phenomenon under investigation. An illustrative example is crucial here!

A situation can be imagined in which a positivist and an interpretivist investigate the English language proficiency of two learners. Those researchers provide the learners a question which both learners answer correctly! The positivist might state in their finding that that the two students answered the question correctly, based upon their direct observation - observation is the method of data collection here. But quite differently, the interpretivist might find out that one of the learners studied smart and was able to answer the question, while the other only made a correct guess! The researcher might be able to discover that through the learners' account in the interview - a structured interview is the interpretivist method of data collection (adapted from Pring, 2000). So, because the positivist believe that knowledge is gained through direct observation (epistemology), they employed observation as a method to collect their data (methodology) so as to be able to observe the tangible reality – the answer sheet of the two students. Due to the fact that the interpretivist believes in the constructed interpretation of the data – i.e. data is constructed between the researcher and the research participants (epistemology) - they would avail themselves of the interview as a data collection tool (methodology).

**3. Different Philosophical Stance**

Weber (2004) who is a positivist rejects the idea that positivists work can provide facts or laws. He notes that the researcher's experience, culture and history can have an influence on their work and its findings. Pring (2015) also seems to disagree with the interpretivists stance and states that social science might provide us with facts about which generalizations can be made. This is because people do possess emotions and capacities, which are predictable, thus enabling "generalizations to be made and 'quantities' to be added and subtracted" (Pring, 2000, p. 51).

Paul Connolly (2012; 2007) is a pioneer in a quantitative research. He is always dealing with such abstract notions as feelings and emotions as though they are being tangible and real! For example, he supplies a number of examples I which the respondents are asked to rate their feeling on a likert, ranging scale from 1 to 5, with one being "Very much like" down to five "Not at all"! According to this scale, the respondents are asked about a given statement whether they like or dislike, and if they do like they need to tell how much they like or if they dislike how much this dislike is! The following experiential example shows this difference in approach.

**Different Philosophical Orientation: An Experimental Example**

Drawing on Connolly (2012; 2007), the researcher did an empirical study in 2012 and collected & analyzed the students' feelings statistically - the analysis was conducted with the help of the Statistical Package for the Social Sciences (SPSS) software! This quantitative study included 80 ESL learners in Belfast! It examined if there was a difference between Middle Eastern & North African ESL students and European ESL students in Belfast in relation to their attitudes towards the student-centered approach. It also investigated if there was a difference between the male and female ESL students regarding their views towards the aforementioned approach. In addition, it raised a question as to whether there is any relation between the their age and their opinions on this approach!

1. **Ontology**

This example followed objectivist ontology where learners feelings were quantified and treated as being something tangible! This is not in accordance with mainstream views as feelings are normally dealt with through a constructivist ontological approach! This has reversed the research formula! In this study, the following three hypotheses were tested:

***H1****: There is a difference between Middle Eastern & North African ESL students and European students in Belfast concerning their attitudes towards the student-centered approach.*

***H2****: There is a difference between male and female ESL students in Belfast regarding their attitudes towards the student-centered approach.*

***H3****: There is a relation between the age of the ESL students and their attitudes towards the student-centered approach.*

2. **Epistemology**

The example followed a positivistic epistemological stance after respondents' feelings were counted as data were collected statistically! The researcher here is totally objective as he had no role in data interpretation as data were analyzed and interpreted via the computer!

3. **Methodology**

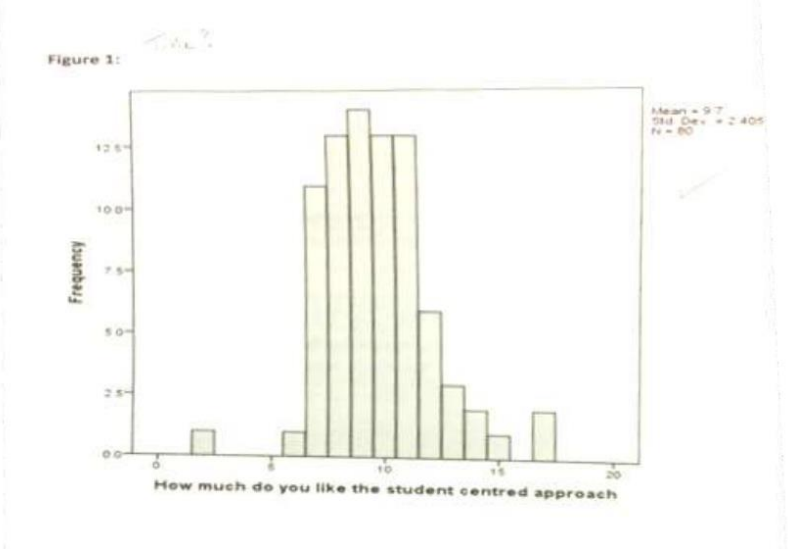
Data were collected quantitatively! A questionnaire was used as a data collection tool! Data were analyzed statistically via the SPSS computer software!

4. **Results**

The statistics showed there was no difference between the two groups as regards their views on the student-centered approach. Also, no gender differences were revealed concerning their stance on the approach. In addition, a Spearman Correlation Test proved no relation between the students'

age and their attitudes towards the examined approach. Figure 1 and Output 1 below clearly illustrate that:

Figure 1:




Output 1:

One-Sample Kolmogorov-Smirnov Test

| | | How much do you like the student centred approach |
|---|---|---|
| N | | 80 |
| Normal Parameters[a,b] | Mean | 9.70 |
| | Std. Deviation | 2.405 |
| Most Extreme Differences | Absolute | .119 |
| | Positive | .119 |
| | Negative | -.106 |
| Kolmogorov-Smirnov Z | | 1.068 |
| Asymp. Sig. (2-tailed) | | .204 |

a. Test distribution is Normal.
b. Calculated from data.

**5. Suggestions:**

It was suggested that future studies with a similar design could involve a large number of students! It was also suggested that the same design could be applied on different topics/fields where the participants feelings are calculated statistically! Other suggestions included adding additional variable to the current variables!

**6. Limitations:**

Time was one of the major limitations of this study. Thus, interested researcher may try a similar research with a longer period of time!

**7. Conclusion:**

The main conclusion in this experimental study was that there was no difference between the two groups as regards their views on the student-centered approach. Also, no gender differences were shown concerning their stance on the approach. In addition, no relation was revealed between the students' age and their attitudes towards the examined approach.

**4. The Current Research Overall Conclusion**

In this research paper, the term paradigm was introduced and its three philosophical constituents: ontology, epistemology and methodology were explained. The paper also showed how ontology impacts on epistemology and how the latter influences methodology. Further, the qualitative and quantitative research methods were discussed! An experimental research example showing how a previous philosophical beliefs could influence the direction of the research was also supplied! This example belongs to a philosophical stance that is different to the mainstream's. ***The main point in this study was that previous philosophical views influence the methodology employed.***

This research paper is significant in that it can help new researchers examine their world views and conduct their research accordingly. Future researchers could provide different hypothetical example. For example, one study might include a hypothetical qualitative interpretivist example. Another study could provide a mixed methods research study example.

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