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Phenomenology as a Potential Methodology for Subjective Knowing in Science Education Research

by **Oscar Koopman**

Abstract

This paper charts the journey that led to the author's discovery of phenomenology as a potential research methodology in the field of science education, and describes the impact on his own thinking and approach of his encounters with the work of Husserl and Heidegger, Merleau-Ponty and Van Manen. Drawing on this theoretical framework, the author argues that, as a methodology for investigating scientific thinking in relation to life experience, learning and curriculum design, phenomenology not only provides a means of accessing subjective knowing and pure perception, but is sufficiently rigorous and systematic to represent the lifeworld experiences of research participants with a high degree of accuracy. In the process, he highlights the uniqueness and value of phenomenology in relation to quantitative and other qualitative research methods. The aim of this paper is to inspire insight into the value in science education research of using a methodology that fosters a deeper understanding of both teachers' and learners' lived experience of the scientific world. The challenge to science specialists, whether educators or researchers, would be to shift their default mode of understanding from the object pole to the ego pole, from the physical object to the human subject, from the observable and measurable to the lived as the true source of human knowledge.

Personal Introduction

In 2010, I commenced my doctoral research into the lived experiences of black Physical Science teachers when they were introduced to a new curriculum. My research focused on the following question: What do Physical Science teachers really think they are doing in the classroom? My quest was to examine the lifeworld of Physical Science teachers from the perspectives of *genealogy* (that is, how did their specialized knowledge of physical science unfold in their lives as learners and subsequently as teachers?) and *portraiture* (that is, how did dramatic events in their personal lives, and circumstances such as curriculum change, inform the process of their becoming Physical Science teachers?). I resolved to focus on both phenomena because learning is a formal as well as an informal process. For example, most of what we learned as children was neither planned nor deliberate. Indeed, we learned to construct our understanding of the world from our interactions with nature, our parents, and our peers. At times we needed to be directed by a teacher, a form of learning that requires structure and planning. From the genealogical angle, I wanted to provide an auto-phenomenographic account of each teacher's experiences from childhood to adulthood, and, from the portraiture angle, a descriptive narrative of how the teachers represent their lived experiences around the fluid educational landscape of curriculum change through the subject of Physical Science. The main challenge was to find a method that would allow me

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to answer the research question truthfully and accurately – that is, a method that would give me access to the thoughts and consciousness of the teachers in order to excavate their eidetic residuum or photographic mental residues that would present their lived experiences from their own personal points of view. Initially, I thought that an ethnographic method was the answer, but I soon realised that I could not research the teachers' experiences adequately or authentically from the outside.

A scholarly work which assisted me in my search for a method that would allow me to sketch the lifeworld of the teachers was Van Manen's *Researching Lived Experience* (1990). Along with providing me with a preferred method, namely phenomenology, Van Manen's work not only assisted me in grasping the essence of phenomenology, but taught me that educational research is a "caring act", to be followed through with a deep sense of thoughtfulness and empathy. I further learned that phenomenology aims to express the essence of what it means to be a child or adult, without needing any further explanation or specification about the respondent. Like Devenish (2002) in his phenomenological doctoral study, I also struggled to grasp the concept of the phenomenon of being. Merleau-Ponty's *Phenomenology of Perception* (1945/1962) deepened my confusion, as he places even more emphasis on the act of caring and exemplifies the significance of embodiment and place in the process of knowledge acquisition. I discovered that the body is both an object and a subject because the concept of the body is linked to both epistemology and ontology. For example, a foot is an *object* of observation but becomes a *subject* when it is used to kick a ball or to walk. Sartre's *Being and Nothingness* (1943/1956) questions the subject-object dichotomy with reference to different states of being. He draws attention to our "own being" in relation both to others and to ourselves. Being "in relation to others" is the struggle to comprehend or define individual existence directly or indirectly in relation to others' existence. This happens when the concrete reality a person portrays appears to be subjective in relation to the surrounding objects. On the other hand, "being in itself" transforms the subject-object relation into a subject-subject relation when individual reality becomes the person's thoughts and consciousness as perceived by the observer.

After immersing myself in these ontological and epistemological "re-presentations" of the world and my place in it, I realised that positivistic methods were inherently deficient in that they often ignore the "being" aspects of the human spirit and focus more on "mathematizing" human behaviour. As the aim of my study leaned more towards unveiling the essence of cause – that is, the challenges Physical Science teachers face in respect of the curriculum, content knowledge and pedagogical praxis – I needed a method that was closely connected to what it means "to be". For the positivist, this concept is objectively defined and depends on how well the evidence is quantified. According to Levering (2006, p. 454), if positivist accounts hold true, the individual's observations of the phenomena in nature are no longer based on sense experience but rather on a mathematization thereof. In other words, Levering holds that positivist knowledge is subject to the quantification of facts which, he argues, eliminates the human sense experiences of vision, sight, smell, taste and touch. This postulate made me question the manner in which science constructs or represents the world. I became conscious of what Husserl, the father of phenomenology, must have thought when he saw Europe lying in ruins at the end of World War I. (See Husserl, 1936/1970, for a full account.)

Husserl (1936/1970) attributes the horrific devastation witnessed to the "technologizing" of science which, in his view, was a step in the wrong direction. He furthermore argues that such damage results when people cut themselves off from the value of lived experience and allow science to predict and explain human experiences. In opposition to this approach, Husserl formulated a new philosophical approach that calls for an epistemological reversal of how people view the world. This reversal relegates mathematics to a lower level than lived experience, with the result that the latter becomes the primary source in the data-construction process and the fundamental starting point in the search for the essence of being (Husserl, 1929/1975 & 1925/1977).

The philosophical thought of Heidegger (1926/1967), Husserl (1936/1970, 1929/1975, 1913/1983), Merleau-Ponty (1945/1962) and Sartre (1943/1956) liberated me from the constraints of positivistic thinking. Like a bird released from a cage, I experienced science anew and recognised the viability of phenomenology as a research methodology that would assist me in answering my research question. In line with the description of phenomenology as a way of seeing how things really unfold, Locke (1689/2009, p. 2) similarly holds that knowledge is rooted in, and ultimately derives its meaning from, experience. It follows that knowledge is neither the internalization of extraneous information nor the unfolding of spontaneous impulses and emotions; rather, it inheres in the reciprocity between an individual and his or her spatio-temporal settings. As such, this view of knowledge encapsulates the moments of knowing that an individual encounters in his or her lifeworld. I realised that these subjective moments of knowing are the lived-through experiences – or, in Locke's words, the "intuition" – of each Physical Science teacher participating in my study. By employing a phenomenological research design to explore their

lived experiences, I could gain entry into the inner world of each research participant. Willis (2002, p. 2) points out that the aim of phenomenological research is to arrive at an accurate understanding and description of moments of knowing as they appear in the consciousness of individuals.

The principal aim of this paper is to encourage science education researchers to recognize the potential of phenomenology as a methodology to explore the "natural attitude" of their research participants. This natural attitude is found in the phenomenological reduction deeply embedded in the consciousness of individuals. A related aim of this paper is to encourage researchers to view their research participants as subjective epistemological beings in order to report their experiences without contaminating the data with extraneous worldview presuppositions, preconceived ideas and notions, or strongly held beliefs.

Husserlian and Heideggerian Philosophy

Curious to know more about this humanistic method, I searched a number of local and international education and science education journals for phenomenological studies that echo the voices of the participants in order to gain more insight into and understanding of the daily realities of South African Physical Science teachers and/or learners. In most of these studies, the authors use either ethnographic, interpretative, case-study, or experiential research methods to answer a specific research question. These studies overlook the lived experiences of teachers and learners, and the authors appear to be distant from the lifeworld of their research participants. Therefore the represented images of conceptual schemes appear to be idealisations, removed from the preconceptual, pre-theoretical, familiar and concrete world of teachers and learners. These studies fail to see into the heart of those moments that matter most to both teachers and learners (Van Manen, 2007, p. 11), and which, in the South African context, are important insofar as they can provide policy makers, curriculum designers and teacher educators with new insights into curriculum change in relation to the Physical Sciences. In contrast to the limitations of the methods employed in these studies, phenomenology elucidates the relation between "being and acting, between who we are and what we are, between thoughtfulness and tact" (Van Manen, 2007, p. 13).

Phenomenology as a method is effectively summed up by Husserl's famous dictum that it is essential to return to the things themselves ("Zurück zu den Sachen selbst!") (Husserl, 1901/2001, p. 168). He explains the central implication of this when he writes: "We must not make assertions about that which we do not ourselves *see*" (Husserl, 1929/1975, p. 9). The German word "Sachen" does not refer to physical objects, but rather to ideas which are subconsciously held. These subconsciously held ideas have their roots in those personal experiences that matter most to us. Koestenbaum (1961/1975, p. xix) clarifies that, according to Husserl, the only way to access these subconsciously held ideas or structures of knowledge is through a consciousness unburdened with preconceived ideas or notions derived from the individual's personal experience or perceptions. This approach, according to Husserl, generates "pure presentations" or "uninterpreted sense data" derived from experience (ibid., p. xxiii). Husserl holds that an individual's consciousness is reflected in his presence in the world, which represents his or her intentionality – that is, the directedness of his or her consciousness towards the object of thought. From this I learned that what is required from a phenomenologist in the field is to behave like someone who is watching and enjoying a film, without analysing its aesthetic, sociological and technical aspects. When the film is finished, the analyses must be carried out objectively and independently of any emotional involvement and unsubstantiated criticism. Husserl uses the phrase "epoché" to explain the process of bracketing the self. In his view, this bracketing refers to the mathematical principle of bracketing an equation. By implication, that which is inside the brackets has no connection with any terms and numbers outside of it. In other words, the experience as divulged in a conversation must be treated as indubitable "givenness" that represents an individual's consciousness free from opinion or correction. In relation to my research, this meant that, during the data analysis, I had to enter a totally presuppositionless space by suspending all possible interpretations and meaning. It required from me to read the transcription of each interview with openness and to enter the individual's world in order to extract meaning from what the person was saying. It must be stated that at times this is difficult, because each participant has his or her own unique way of experiencing temporality, spatiality, and materiality, but each of these co-ordinates must be understood in relation both to others and to the respondent's own inner world (Hycner, 1985, p. 29).

Given the complex structures and notions of Husserl's thought, I realised that phenomenology could be a minefield for novices. The reason is that, although phenomenology does not make use of inductive techniques, it is not entirely independent of these. However, in the data-collection process, any experience must serve as foundation data in order for the researcher to arrive at a clear understanding of the lived world of individuals. In other words, according to Husserl (1925/1977), mental acts, including the objects in the person's memory, point towards some "Sachen" or matters of importance that are external to the individual. These matters of importance are

presented to individuals as an object-for-a-subject. For example, the scent of a rose, the taste of an apple, or personal feelings become an experience that crystallizes in the consciousness of individuals. These experiences become intermeshed with an ever-present pure consciousness, leading to the observer constantly having to re-examine existing perceptions. Therefore, reality, or the lived world of individuals, can rightly be said to be external to the observer, just as the reader of a book is external to the book itself (Koestenbaum, 1961/1975, p. liii).

Heidegger's *Being and Time* (1926/1967), dedicated to Husserl, developed Husserl's ideas further and adopted an ontological stance towards his philosophy of phenomenology. Heidegger's focus leaned more towards the nature of being rather than "becoming to know". Rekindling the debate about the meaning of what he terms *dasein*, Heidegger asserted that consciousness is not separate from the world but a formation of historically lived experiences. He believed that people are self-interpreting beings – that to live is to listen and to derive meaning from experience. In *The Essence of Truth* (1932/2002), Heidegger attempted to understand and explain the nature of shared meaning among human beings in terms of what a culture gives a person from birth as a way of understanding the world. He strongly believed in the importance of context, which he defined as time and space. His notion of phenomenology is inductive and descriptive by nature and focuses on, or recognises, the importance of the subjectivity of experience.

Heidegger's (1926/1967, 1932/2002) philosophy assisted me in faithfully representing the essence of the data transcriptions. This involved meticulously scrutinizing each word, phrase, sentence and paragraph in the interview transcripts in order to distil the true nature and essence of each participant's everyday involvement with the world. The interview as a whole provided a context for the emergence of specific meanings and events. From this I could deduce the fundamental reasons why the individual research participants behaved the way they did. It allowed me entry into their consciousness, which unveiled the tangible structures of their experiences. From this I could represent why they said what they said and how these events unfolded in their lives as Physical Science teachers

Within the context of this paper, educational research, or research that involves human beings, is construed as a not only necessary but imperative move away from positivistic and interpretative paradigms that speak directly to the object pole. It is through the ego pole (the element of consciousness) that human beings can see and grasp the essence of a phenomenon. The transition from the object pole to the ego pole brings us closer to an understanding of what is really happening in the mind of the individual, or what Husserl (1925/1977) considers to be truth. Heidegger (1932/2002) avers that truth, in essence, speaks of "unhiddenness" (p. 8), insofar as it refers to that which is no longer hidden or has been torn away from hiddenness [*Verborgenheit*]. In his view, truth has little to do with factual context, but rather reveals the unhiddenness that speaks about directedness arising from fundamental experiences in the real world (pp. 5-7). This leads to a discussion of the value of lived experience in science education.

The Value of Researching Lived Experience

Van Manen (1990) defines a methodology as the philosophical framework that underpins the fundamental assumptions and characteristics of human science. Carr (2006), in turn, states that a methodology refers to the "theoretical rationale ... that justifies the research method appropriate to a field of study" (p. 422). It follows that a methodology cannot be derived from research, but must instead be grounded in *a priori* theoretical knowledge, usually referred to as philosophy. In the natural sciences, an investigation is not guided by a specific methodology but by a pluralist view of methodology. Researchers are guided by the aim and subject matter of their discipline and develop a methodology accordingly. Therefore, from a humanities point of view, the research subject is presumed to be the starting and end point of the research process. This is often ignored by researchers, with the result that the textual expression of the essences is in the form of findings, which are an incomplete view of the participant on the continuum of his or her lived world.

According to Husserl (1913/1983, p. 5), cognition begins and ends with experience. Gadamer (1960/ 1975, p. 34) argues that experience has a condensing and intensifying meaning. He maintains that the totality of experience is found in the "significant whole", which refers to not only the momentary presence to consciousness of what is experienced, but to its unity with the whole of a person's entire life experience as an integral part of its permanent presence. Koestenbaum (1961/1975, p. xxxviii) notes that, in Husserl's view, this whole or unity of an object of experience is something that is given among various appearances and not something separate and alongside it. It is considered a structural nexus that is contextually connected to reflect upon so as to give it a significant quality of meaning. Therefore, according to Husserl, phenomenology is a form of inquiry that holistically describes the research participants' lived experience of meaning-making and informs us about their perception of the focal object or phenomenon. These perceptions can provide phenomenological researchers with the necessary conceptual tools to

understand human behaviour and actions and to do something about the latter when necessary.

In view of the above, phenomenology is both a theory and a method. Its epistemological and ontological disposition is predicated on the lived world or lived experiences of individuals. As a methodology, its ontological representation suggests serious and original thinking about how individuals perceive or understand the world. The essence, however, of a phenomenological study is the endeavour to answer the question of what it means to be (Groenewald, 2004; Heidegger, 1926/1967). Answering this question requires an active science with a unique methodology. In such a paradigm, the attitude of the researcher should not be one of superiority in relation to the participant's understanding of the world. According to Heidegger (1926/1967, p. 38), the essence of being (*dasein*) lies in existence. The question of existence can only be addressed through "existing", which implies that it is only through engaging with lived experience that our existence in general can be interrogated. Heidegger invites us to think of a particular self-interpretation that a given *dasein* lives out: the existential possibility it chooses to enact as an existential understanding, which he describes as an ontic state. In other words, in Heidegger's conceptualization of being, *dasein* provides the richest, most complete and most revelationary way of engaging with a phenomenon in fundamental ontology. In this way, people gain an understanding of what it is that they comprehend about a particular phenomenon.

Dasein, or the search for understanding about understanding, can be conceptualised as a non-methodological journey whereby the researcher enters a space (domain) of personalness that calls for a personal engagement with the subjectivity of another (Heidegger, 1926/1967, p. 41). This is critical in the research context, because the participants' description of the world must be rendered in their own words, as distinct from the researcher's verbal account of it. In order to understand how they experience the world, the participants themselves must thus verbally construct their personal world and the meaning derived from it. One way of ensuring this is to return the written summary of each participant's description to him or her for a validity check and to involve the participant in considering the accuracy of the researcher's description of the experience. In so doing, the participant can confirm whether or not the information has been correctly captured and whether or not any corrections are needed. Furthermore, the participant should be given the freedom to add or remove information. Based on this premise, phenomenology is essentially interested in the subject's epistemological and ontological disposition. In other words, the phenomenologist asks what the truth is about this or that and strives to express it in an uncontaminated (unbiased) way in order faithfully to reflect not only others' understanding of their own experience, but a rational understanding on his or her own part of what it means to be using *pure data*, which is also termed *lived-through data*, as discussed later in this paper.

Dasein is a question of both the present and the past. Our existence in its entirety includes our preceding existence; therefore, we are not only present *now* but represent the fusion of our past, present and future. It is common knowledge that past occurrences can significantly affect the present and the future. Heidegger (1926/1967, p. 3) argues that the present, the past and the future are the collective theme of all human phenomena of experience. A person's existence or experience thus cannot be accurately understood or explained without considering the interconnectedness of the present, the past and the future. For this reason, phenomenology as a method goes against the grain of the orthodox scientific attitude, which focuses on the object pole rather than on embracing the subjective world of the individual (Levering, 2006, p. 454). For example, fear can neither be objectively understood nor measured. Spanos (1976) argues that the only way to understand a phenomenon (in this case, fear) as experienced by another would be to live in both the body and the consciousness of the person and actually experience it from that perspective. Otherwise, all that we can observe is an inner self that shows up on the outside, but can never be understood. This is not to say that interpretative, quantitative and mixed methodologies cannot produce trustworthy or reliable data. These methodologies are, however, inadequate for the purposes of accurately describing or converting the data into fixed writing. A real-life event cannot be perfectly captured in writing, because language has limits in respect of what can or cannot be accurately represented. This accords with Derrida's (1967/1978) thesis that there is no stability in language and that it therefore cannot accurately describe a lived event or experience because dispositions such as mood, and phenomena such as fear and sadness, cannot be captured in language (p. 4). For the same reason, the person who aims to describe or report a phenomenon is forced by the limits of language to reduce the content in the process of translating his or her lived experience into a medium of expression that makes it accessible to the understanding of others. The notion of "embodiment", as described by Merleau-Ponty (1945/1962), may be of some help here. In Merleau-Ponty's view, a person normally projects meaning that is constituted only in that person's own world. For the meaning of what has been formulated only through the medium of words to be embodied, "a human productive power must reveal itself". Merleau-Ponty (1945/1962, p. 112) refers to this as

"summoning", inferring "the sense in which a medium summons and causes an absent person to appear". In other words, through the medium of language, the spirit of what is not present can be summoned to make itself manifest in the present.

In the present, things such as the disposition of mood and context are, for the most part, absent, leading to a misrepresentation of truth. In Heidegger's (1932/2002) view, evidence becomes doubtful and can be regarded as everyday opinion if personal histories are taken as belonging to the past (p. 45). For Heidegger, it is only when the individual's background (context/ontology) or historicity is foregrounded that the visible becomes meaningful and truthful. Therefore, a consideration of both the past and the present allows the voice of the participant to be reliably reported or represented. The inner voice of the participant becomes the first-person data needed to arrive at a proper understanding of the person's real, lived-in world. So, with specific reference to the research context of science education, instead of trying to theorize about the activities or behaviour of teachers "objectively", the researcher should allow the subjective nature of phenomenology to reflect the uniqueness and essences of their lifeworld with deep sensitivity. This begs the question as to how the uniqueness of a participant can be rendered in a trustworthy way and how phenomenology embraces this uniqueness.

The Uniqueness of Phenomenology as a Research Method in the Search for Truth

The reason that phenomenology is described as a "science of the unique" is because intuition is unique. Intuition is a pre-theoretical phenomenon that describes the directedness of consciousness towards an object. In its most basic form, intuition can be described as perception (Husserl, 1925/1977, p. 57), which represents the individual's understanding or view of, or ideas about, the world as revealed by or extracted from the *eidetic residuum* or *eidos.* Husserl uses the phrase "grasping and seeing" to express these sensations which are considered an active part of the way people think and construct the world in order to make sense of it.

The two key phrases used in phenomenology to denote the process of extracting or capturing consciousness as revealed in people's eidetic residua are "lived world experience" or "lived-through experience". Husserl (1907/1997) conceived of lived experience in a mathematical spirit – that is, as a reflection-based elaboration of the structures or forms of experience in accordance with their *prior* possibilities, which infers a lack of concern with empirical matters of fact regarding the phenomena under study. Husserl explains this as follows:

> The conditions of the "possibility of experience" are the first. Conditions of the possibility of experience signify, and may signify, here, however, nothing else than all that resides immanently in the essence of experience, in its *essentia*, and thereby belongs to it irrevocably. The essence of experience, which is what is investigated in the phenomenological analysis of experience, is the same as the possibility of experience, and everything established about the essence, about the possibility of experience, is *eo ipso* a condition of the possibility of experience. (1907/1997, p. 119)

In essence, experience should be referred to as first-person data. This is because, in mathematics, the mathematician always starts with, "There are 7 triangles …". For this reason, Husserl (1907/1997, p. 40) asserts the centrality of consciousness in human experience and points out that phenomenological data are "lived-through data". In this sense, the data given to someone are experiential, that is, preceding any reflection. Indeed, such data either are "lived through by" or are "experimentally given to" someone. In essence, data are not considered objectively and cannot be reflected upon by anyone else. Realities must therefore be treated as pure phenomena and as the only absolute data from where to begin. Husserl calls this the science of pure phenomena.

Phenomenology emphasises the human experience and its experiential action in the world (Van Manen, 1990), which is guided by consciousness. People's consciousness represents their ability to think. In essence, consciousness is not a matter of "I think" but firstly of "I am" (Merleau-Ponty, 1945/1962). "I am" refers to our existence in the world. According to phenomenologists, the domain of "I am" should be the starting and end point of research methods (Van Manen, 1990). Heidegger (1926/1967) argues that it is only then that our inquiry becomes a form of thinking aimed at understanding human life:

> The things for which we owe thanks are not things we have from ourselves. They are given to us. We receive many gifts, of many kinds. But the highest and really most lasting gift given to us is always our essential nature, with which we are gifted in such a way that we are what we are only through it. (p. 142)

The above extract suggests that researchers in science education ought to position themselves in such a way that their understanding of the research participants becomes a *self-transcendent* reflection of how each participant sees himself or herself in the science classroom. This will methodologically foreclose the

elusive, ambiguous and tenuous views of the participant without the researcher seeking for motive, cause or agenda to provide a description of the experience. A descriptive account does not provide an effective theory with which to explain and control the world of the individual, but it affords the researcher the possibility of attaining plausible insights which might bring about a more direct contact with the world of the individual participant. Consequently, it raises the question as to what makes researching lived experience different from other quantitative or qualitative types of studies.

Firstly, lived experiences are concerned with those areas of human existence that provide insight into the silent voices of consciousness, purposiveness and meaning. Insight provides a glimpse into what is happening in the mind of an individual, but without the certainty of a full understanding of the person. Understanding only becomes possible to the extent that researchers have methodologically secured themselves against any misunderstanding. Being alive or to live is neither a problem that researchers need to resolve, nor a mistake that needs to be corrected. Correct intentions will ensure that the questioning of human existence will not reduce the human agent to an object without reflecting on the entirety of the agent's experience. Furthermore, lived experience is an attractive and trustworthy methodological passageway into the consciousness of an individual and hence to insight into the process of human inquiry. It makes it possible to understand the everyday lives of individuals more carefully and attentively without any preconceived notions and views. This requires researchers to be open to their own experiences and to the experiences of others and, in so doing, to set aside dogmatic arguments and opinions. The experience becomes a passageway with which to access data that awaken researchers to a deeper level of understanding in their own practice of how to live authentically with themselves, their colleagues and learners. In the words of Kierkegaard (cited in Carson, 1992, p. 105), lived experience is a form of "remembering forward" and understanding how the process of knowledge acquisition unfolds. In other words, life can only be understood backwards, and the lessons learned from the past are often carried into the future. In other types of research frameworks and methodologies, such as ethnography, case studies and surveys, the research can become impersonal. Researchers often fragment and abstract teachers' and learners' experiences in such a way that their experiences become incomprehensible. In this regard, Van Manen (cited in Brown, 1992) asks: "Is it ever possible to observe a child's [teacher's] experiences in a pure way?" (p. 47). In most studies, researchers illuminate some aspects of teaching, but at the cost of discussing their significance in isolation, divorced from the lives of teachers and learners. As Brown (1992, p. 44) points out, it makes no sense to sever experiences from their highly complex and interwoven context.

Phenomenological researchers are expected to take a transcendental leap into the minds of the participants in order to view their experiences as data. Since phenomenology is an act of *doing*, the novice researcher in this field has difficulty understanding it as a philosophy. Husserl (1929/1975) reiterates that one cannot understand his philosophy by merely reading it. Phenomenology is about doing. Eagleton (1983) explains how Husserl (1936/1970) saw Europe lying in ruins as the result of an uncritical acceptance of objectivistic and natural views of knowledge. This crisis highlights the inability of natural science to consider how the subjectivity of the researcher inevitably participates in the constitution of scientific knowledge. Phenomenology aims to reveal this participation by describing the essential correlations between any intentional act of consciousness and the corresponding intended object of experience. Husserl believes that the natural scientist has lost touch with the lived world of experience, fails to grasp the connection between scientific knowledge and everyday experience, and erroneously presupposes that the lived world has an ontological foundation.

Conclusion

This paper has outlined the author's journey and tireless efforts to grasp the conceptual field of phenomenology in all its complexity. His journey shows why it is important that novice researchers in the field of phenomenology must first become well acquainted with the theoretical framework and its complex methodology before applying it. The paper also indicates how novices might enter into the lifeworld of teachers and remain open and attuned to the complexity and unpredictability of their inner lives. From this standpoint, the paper stresses the importance of returning to lived experience to lay bare human consciousness in order to represent the lives of teachers as accurately as possible. It points out how phenomenology embraces the common features of the essence of human experience and views experience and behaviour as being locked in an integral and inseparable relationship (Moustakas, 1994, p. 8). In this regard, phenomenology focuses on the structure and the variations of the structure of consciousness (Giorgi, 1989). It provides a theoretical description of lived experience as revealed primarily through the consciousness of an individual, without any intention to justify, explain or interpret the experience.

Husserl (1929/1975, 1925/1977) has shown that, as a research methodology, phenomenology is rigorous and intellectually precise in that it allows the data to

flow freely from the research participant to disclose the immediate consciousness from which the structure of experience and the fundamental epistemological facts about a phenomenon derive. By bracketing out the researcher's dogmatic beliefs, judgements and preconceived ideas, the unadulterated apprehension of experience is made possible and allows the researcher to perceive the uniqueness of the individual. Husserlian phenomenology has great potential for elucidating science education, insofar as Husserl's methodology articulates a scrupulous commitment to the research participant's voice in educing the meaning that expresses our essential existence as human beings. This paper explains why this is so and builds a case for its value in science education.

In closing, it is fitting to recount Van Manen's parable (as cited by Brown, 1992, p. 59) describing how two persons, one a passer-by and the other a teacher on playground duty, observe a girl skipping. As the passer-by reviews the scene in his mind's eye, he sees himself skipping, which takes him back to his life as a learner. He experiences a sense of regret and loss linked to a yearning for his school days. He, however, quickly realises that those days are gone, slips back into his present reality, and continues his journey. Van Manen next describes the same girl skipping as seen through the eyes of the teacher. The teacher also experiences regret and sadness, but for a different reason. He feels this way because he knows the child. In every skip, he senses the deep anguish and loneliness of the child, caused by an over-demanding mother.

Significantly, although both individuals saw the child, only the teacher saw the real person. The passer-by saw his own past, but the teacher saw the needs of the child. It is, therefore, possible for a researcher to see his or her subjects and yet to fail to see the depth of the humanity embedded in their consciousness.

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