

JOHANNES L VAN DER WALT**UNDERSTANDING THE NATURE OF STRUCTURES IN EDUCATION:
RECENT DEVELOPMENTS****Introduction**

In this paper I would like to talk about how 21st century education researchers could, and most likely, should approach the scientific description of the various entities that they might encounter. The word “entities” in pedagogical context refers to phenomena and structures such as “an education system”, “education”, “curriculum” or “motivation”. Let us take the entity or phenomenon that we all know as “an education system”. Taken at face value, an education system consists of various elements such as schools, management structures, financing structures, support structures, curriculum and curriculum planning, physical facilities, learners, educators, community support, and many more. We could say that it is relatively easy to describe these different elements of the education system and show how they all fit together to form an education system as a total structure. I would argue, however, that such a description would be scientifically indefensible for the mere fact that, in view of current scientific approaches, the description could be seen as simplistic and reductionistic.

The purpose of the remainder of this paper is to offer grounds for this claim. I structured the paper as follows. I shall begin by briefly outlining three basic epistemological approaches, and then use that outline as the basis for a further discussion of how one could conduct research into pedagogical/educational structures in a manner that would circumvent simplistic and reductionistic descriptions.

The gist of the 2014 BCES Conference Paper

In that paper (Van der Walt, 2014a, pp. 24-31) I argued that researchers nowadays have a choice of three research approaches: foundationalism, post-foundationalism and post-postfoundationalism:

- The foundationalist approach or broad research paradigm that has been in vogue since the rise of Rationalism in the 17th century is typically characterised by aspirations on the part of the researcher to formulate so-called grand narratives that might explain how intricate structures (such as education systems) are constructed and function. In most cases, since this approach is rooted in Rationalism, such grand narratives are founded on sets of preconceived or a priori ideas, assumptions and convictions. The foundationalist approach tends to be deterministic in that it attempts to show how certain factors necessarily impact on other factors, and that such impact can even be predicted on the basis of previous research that had discovered certain general patterns or “laws”. Applied to, for instance, our understanding of how an education system is structured and works the researcher with a foundationalist orientation would attempt to discover generalizable and universalistic laws and would be tempted to illustrate in an organogram how everything fits together and functions in the grand narrative that we refer to as “an education system”.

- The second research approach or paradigm that the researcher can opt for can be referred to as post-foundationalism, an approach that is closely related to a post-modern approach to life and culture in general. This approach is typically characterised with a rejection of all the ideals and aspirations of foundationalism, particularly its ideal of constructing large-scale explanations (so-called grand narratives) and explanatory models. It rejects the notion that the construction of such grand scale models is at all possible and also the idea that a researcher should work from certain preconceived ideas, assumptions or convictions. In brief, it is averse to all types of philosophical, religious and scientific foundations that supposedly might influence one's research. As a result, research according to this approach is piecemeal, pragmatic and problem-oriented. Applied to the matter of understanding, for instance, the structure of an education system the post-foundationalist would opt for an analysis of a single system in a problem-oriented manner without attempting to draw generalizable conclusions or points of view from the analysis.

- The third research approach that researchers might opt for is post-postfoundationalism, a research orientation that attempts to steer through between the determinism of foundationalism and the indeterminism (relativism) of post-foundationalism. Whereas in foundationalism the researcher's preconceived principles, convictions, ideals, suppositions and norm structure are strongly foregrounded, and whereas in post-foundationalism these foundations are rejected or their validity and applicability strongly contested, post-postfoundationalists tend to keep such foundations in abeyance in the back of their minds and allow them only to play a part in the research process once the phenomenon in question has been analysed and closely investigated. Applied to the issue of understanding, for instance, how an education system is structured and functions, the person with a post-postfoundationalist orientation will analyse various education systems *without* compromising the investigation with a set of preconceived normative ideas about how education systems *should* be structured and function. In the post-postfoundationalist mind-set the life-conceptual and other convictions of the researcher may be allowed to play a role as the process of understanding unfolds. This approach allows for various "understandings" of what we mean by the term "education system".

The above outline is a very brief overview of the three basic research orientations that researchers could consider. I now wish to take the argument a step further by offering a few ideas about how researchers nowadays can avail themselves of the advantages of a post-postfoundationalist orientation the usefulness of which is locked up in the fact that it is a balanced approach that rejects the determinism of foundationalism on the one hand, and the indeterminism of the various forms of post- or anti-foundationalism on the other. I offer some suggestions below against the background of the current terminological confusion in methodology textbooks¹.

¹ What one author refers to as a research paradigm another might see as a research approach, another as a theoretical approach, another as a research orientation, another as a research strategy or part of the research design, and yet another as a theory or even a method. Inexperienced researchers are confused by this terminology.

Unpacking post-postfoundationalism in terms of research theories and research methods

In recent months, I have explained in several of my publications what I mean by using the term “post-postfoundationalism” (see Van der Walt, 2014a, pp. 24-31; Van der Walt, 2014b; Van der Walt & Steyn, 2014, pp. 827-829; and also my other contribution in this year’s Proceedings of the BCES Conference). What I now offer in the rest of this paper is an attempt to relate the notion of post-postfoundationalism to paradigms, orientations, approaches, theories and paradigms that experts discuss in education research methodology books. I shall attempt to show how one can follow a post-postfoundationalist orientation by taking a post-positivistic stance, by applying theories such as post-structuralism, chaos theory and complexity theory, and by implementing methods such as interpretivism, constructivism and even fuzzy logic. By following this route, researchers can circumvent the determinism and reductionism of a foundationalist orientation, and the (total) relativism and indeterminism of a radical post-foundationalist orientation.

Post-positivism as a post-postfoundationalist stance

Post-positivism can be regarded as a post-postfoundationalist stance since it allows for certain limitations, contextual factors and the use of multiple theories in terms of which research findings can be interpreted (MacMillan & Schumacher, 2010, p. 5). In allowing all of this, it is a move away from positivism, a stance that can be regarded as foundationalist because of its cause-and-effect scheme and its ideal of discovering generalizable (natural) laws. Post-positivists believe that reality (in this case, the structure of an education system) can be understood but never perfectly understood; research therefore has to be conducted with an awareness of the subjectivity of the researcher. Post-positivists are quite prepared to incorporate interpretivist concerns around subjectivity and meaning. Reality (also in the form of an education system) is multiple, subjective and constructed by people and hence not a fixed entity that exists in a vacuum; it is always influenced by context (cultural, gender, and so on). Post-positivists therefore search for evidence that is valid and reliable in terms of the existence of the phenomenon in question rather than in generalisation, and hence not in absolute truth in the form of generalisation and laws (Maree, 2008, p. 65). Post-positivists believe therefore that researchers can only describe a phenomenon even if it does not necessarily “measure” the phenomenon (Henning, 2011, p. 17). Secure, once-and-for-all foundational knowledge and grand narratives of a singular objective reality are replaced in post-positivism by tentativeness and multiple warrants by the researcher (Cohen, Manion & Morrison, 2011, p. 27).

Three theories that could be applied in a post-postfoundationalist approach

Post-structuralism

Post-structuralism can in a certain sense be equated with postmodernism (Merriam, 2009, p. 10). Radical postmodernists take an anti- or postfoundationalist stance in that they reject all grand narratives and all claims to absolute truth. However, less radical forms of post-structuralism can be regarded as post-postfoundationalist because they assume that there may be a variety of truths, and that the truth may be couched in variety, diversity and plurality. Post-structuralists hold that structures, hence also the structure that we refer to as “an education

system”, are not easily discovered and in some cases are not even discoverable at all. Our statements and conclusions about such structures are therefore unavoidably fallible. Despite all of these encumbrances, we have to persist with our investigations of structures (Maree, 2009, p. 22) since that provides us with new knowledge. Post-structuralism is also post-postfoundationalist in that it entertains the idea that all perceptions, concepts and truth claims are couched in corresponding “subject-positions” which are nothing more than transient epiphenomena of a certain cultural discourse. According to Honderich (2005, p. 746), foundationalists find post-structuralism unacceptable because of its anti-transcendentalism (transcendentalism is typical of foundationalism), its scepticism and relativism. Poststructuralists clearly differ from foundationalists in that they emphasize becoming over being, change over permanence and interrelation over individual substances (Mickey, 2008, p. 24).

Complexity theory

In terms of complexity theory, an education system would be regarded as a complex organisation consisting of a set of interdependent parts which together, in various possible configurations, make up a whole that is interdependent with some larger environment. Because of their complexity, systems resist simple reductionist analyses because interconnections and feedback loops preclude holding some subsystems constant in order to study others in isolation. Complex systems can arise from the interaction of agents that follow relatively simple rules. Patterns are “emergent” from these interactions in the sense that new properties appear at each level in a hierarchy, and therefore are never fully predictable (Anderson, 1999, pp. 216-218). No single factor can explain how the system actually works or succeeds in its mission.

Complexity theory regards an outcome (for instance, whether an education system functions according to expectations) as emerging from a complex network of causal interactions and not of single factors that can be accurately measured. The fact that analytic reduction cannot tell how a number of different things and processes act together when exposed to a number of different influences at the same time (which is typical of education) (Dekker, Cilliers & Hofmeyr, 2011, pp. 1-3) makes complexity theory an excellent exemplar of a post-postfoundationalist approach to research.

Chaos theory

Chaos theory also fits into the post-postfoundationalist approach to science, on condition that the notion of “chaos” is correctly defined. Fowler and Van der Walt (2004, p. 65) correctly argued that “chaos” in chaos theory, contrary to the common use of the word, does not designate a state of disorder. The use of the term “chaotic systems” already indicates that a form of order is being implied. Some systems and structures are described as chaotic systems not because they are disorderly but because of their unpredictability. What we learn from chaos theory is that we should not think of the world as orderly in the sense of conforming to various laws and regularities only if and when one can predict the outcomes of a certain action, on condition that one creates the right conditions. In line with complexity theory (see above), certain systems or structures (arguably also an education system) is a complex open system of which certain aspects and sub-structures behave apparently unpredictably and indeterministically though at the same time, if viewed from a

distance or after a certain time, will be clearly ordered and law-like. In such systems, say Fowler and Van der Walt, there is “order in disorder” and not a total absence of order. In a foundationalist conception, order is characterised by necessity and predictability. However, the order we encounter in today's world of physics and non-linear dynamics is characterised by contingency rather than necessity, unpredictability rather than predictability, and a dynamic, non-linear causality rather than linear causality. In analyses of education systems, therefore, it is important to make very clear the nature of the “chaos” that is involved.

Chaos theory brought to our attention the existence of more than one kind of order in our world. Once education systems researchers begin to understand this new concept of “order” they will be open to the fact that education systems are flexible, not all predictably the same, show a great diversity, that they respond, each in its own way, to their contexts. They will also be more prepared to approach education systems with a problem-focus rather than with a rigid structure focus. They will welcome the unexpected and the unpredicted, not as disruptions to their orderly conception of education systems but as opportunities for understanding a world that is full of surprises (Fowler & Van der Walt, 2004, p. 66).

Three methods that could be applied in a post-postfoundationalist approach

Fuzzy logic

Post-postfoundationalists will more readily accept the usefulness of fuzzy logic than foundationalists with their more rigid deterministic orientation. In a foundational situation, X is either a member of a set or not, whereas in fuzzy logic X can be a member of several sets and to any degree between 0 and 1 where degree 0 corresponds to “is a member” and 1 corresponds to “is not a member”, with various degrees of vagueness in between (Audi, 2005, p. 337). Fuzzy logic clearly allows for degrees of truth: a proposition may, for instance, be to a degree both true and false, and a proposition and a negation to some extent both be true. Fuzzy logic does justice to the intuitive idea that some indicative sentences are not wholly true and not wholly false (Honderich, 2005, p. 326). Applied to our understanding of the phenomenon “education system” this could refer to the many imponderables involved in the investigation (typical of complex systems), which leads to the conclusion that what one might say about one education system might not be true for all other systems or might indeed be false in the case of another system.

Interpretivism

Interpretivism as a research method is characterized by a concern for the individual and for understanding of the subjective world of human experience. Efforts are made to get “inside the person” and to understand a situation from within. Furthermore, interpretivism concentrates on action and not on the state of static structures. This, according to Cohen et al. (2011, p. 17-18), “may be thought of as behaviour-with-meaning, as intentional behaviour and as such, future-oriented”. The data yielded by an investigation of an aspect of reality (such as an education system) will therefore include the meanings and purposes of all involved in the situation. The theory thus generated must make sense to the researcher in one particular time and place as opposed to different meanings that might emerge in other times and places. The theories that result from the application of interpretivism “are likely to be as diverse as the sets of human meanings and understandings that they are to explain”. Interpretivism as a method is quite suitable to a post-

postfoundationalist approach in that “the hope of a universal theory (grand theory or narrative) which characterizes the normative (foundationalist – vdW) outlook gives way to multifaceted images of human behaviour as varied as the situations and contexts supporting them” (Cohen et al., 2011, p. 18). Interpretivism is closely associated with social constructivism and holds that there is no single observable reality but rather multiple realities and interpretations of a single event. Researchers, therefore, do not discover knowledge or meaning but rather construct it (Merriam, 2009, pp. 8-9).

Constructivism

Constructivism is a term that is often used interchangeably with interpretivism (Merriam, 2009, p. 9). Radical constructivists tend to argue that knowledge has no permanent, objective and stable truth-value; they argue that researchers can never understand the world and reality objectively since each person interprets the world on the basis of personal background, experience and interactions with reality and other people. The usefulness of the knowledge or meanings that one develops with respect to reality therefore depends on the degree to which the researcher’s concepts, models and theories are adequate as explanatory for the knowledge of the meaning that is being applied. Radical constructivists also tend to question the idea of an underlying order in reality (much in line with chaos theory in its more radical forms) that researchers have to study and discover. Instead, as Van der Walt and Fowler (2006, p. 15) show, persons construct and interpret their own life world and the meanings therein, and their constructions are always open to revision. Knowledge is only “true” or worthwhile if it helps the researcher make meaning of reality. Less radical constructivists, Van der Walt and Fowler (2006, p. 49) conclude, accept the possibility of an orderly given world of which the researcher must construct meaning for him- or herself.

Conclusion

The above theories and methods are of course not the only ones that could be considered for implementation in a post-postfoundationalist approach. Critical theory, advocacy theory (including feminism), participatory theory and grounded theory come to mind as other theories that might also be considered². Point is, only theories that do not attempt to result in grand scale constructions and explanations, in deterministic cause and effect structures, in working out preconceived structures and systems should be applied in a post-postfoundationalist approach.

As a final word, I return to the aim of this paper, as stated at the outset, namely how 21st century education researchers could, and most likely, should approach the scientific description of the various education / pedagogical entities that they might encounter. It is clear from the discussion above that researchers with a penchant for creating grand narratives would opt for the foundationalist approach whereas those who are critical of the viability of and / or need for such grand scale theories would opt for one of the other two orientations. In view of the fact that all researchers to a

² Empiricism, Behaviorism, Pragmatism, Functionalism, Phenomenology, Realism and Structuralism come to mind as theories that might not come into contention because of their emphasis on measurable data, cause and effect thinking and their deterministic views about relationships between entities and within their structures.

certain degree and extent inevitably have a number of preconceived pre-theoretical (life-conceptual, philosophical) and theoretical (scientific) presuppositions, convictions and ideas in the back of their mind and would also prefer to avoid the reductionistic and simplistic tendencies associated with such grand scale theories or constructions, the post-postfoundationalist orientation would probably provide best in the needs of educationists plying their trade in the early 21st century. It is also clear from the discussion above that researchers' choice of a broad epistemological orientation would dictate their choice of theories and research methods.

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