Encouraging an Appreciation of Qualitative Research by Positivists, Using Metaphors from Physics.

Introduction

This paper aims to persuade health professionals with a science background that a qualitative research method can have value and meaning and count as research by following the author’s path of thought from a positivist paradigm to interpretivism. The case is made that qualitative research has a place within a science based profession and the paper seeks to guide a perhaps initially sceptical reader towards considering and engaging with non-quantitative methodologies made understandable using metaphors from quantum physics. These metaphors come from a discipline understood by professionals with a science background and attempts to help them see research from a different perspective. An exploration will be made of how subatomic particles can be observed to have different properties according to how they are measured, and similarly how human behaviour can be observed from different perspectives, giving different results, both of which document versions of the same phenomenon.

Radiography students need to have a science based education for entry to the course and perhaps as a result of this scientific grounding the dominant research discourse within the profession tends to be one of positivism which has been reflected in research outputs. In undergraduate and postgraduate teaching and in the clinical setting it is hoped that the impact of this approach will be to change the way research methodology is taught in radiography by introducing a wider range of methodologies to students thus helping to avoid them becoming polarised in their views before having a chance to explore and develop other perspectives. In the profession of radiography, as in other professions with a predominantly positivist discourse, it is hoped that a wider range of methodologies will be considered and used in research.
Current position in radiography research

The place of research in increasing the body of knowledge and thus infer professionalism in a discipline such as radiography is well recognised and promoted (Probst et al. 2011), (Malamateniou 2009). However as a profession radiographers have seemed in the past to be reluctant to use and publish qualitative research, favouring instead quantitative research (Murphy and Yelder 2010), (Munn et al. 2013) perhaps as result of the dominance of their learned and cultured positivist paradigms. Munn et.al. (2013) comment that there is a history in medical imaging of quantitative research, a legacy of the medical professions’ investigation into disease and imaging, without consideration of the human relationship between the professional and the patient which has had a lasting an effect on the profession. Hammick (1995) notes that physicists and clinicians historically controlled research in imaging to the detriment of radiographers’ development in this area.

The aim here is to show how a researcher from a positivist paradigm, for whom quantitative research is the only ‘true’ way of measuring, can be persuaded that acceptance of the qualitative methods of research is possible and plausible. Not only might this encourage more qualitative research to be performed and used, but also help qualitative research be accepted as valid and worthwhile and avoid being dismissed as not being ‘real research’ in radiography (Hammick 1995).

Is there a place for more qualitative research in science based healthcare?

For a profession with a strong scientific, medical and technical background such as radiography, collecting and analysing numbers data fits with the notion of making things ‘better’, however one can argue that collecting qualitative data could be developed as a way of interpreting the human relationships aspect of the practical side of the daily delivery of the service (Punch 1998).

Using the metaphor of a bedsore the place for qualitative research in medical fields will be explored. Current best practice is to avoid bedsore formation and to treat the bedsore and by inference the patient, once it forms. Ideally the patient is ‘cured’ and then discharged. However, what is the experience like for the patient? Perhaps if they have a bedsore, they will enjoy more attention from nursing staff. Distant family
may visit more often and some of the stresses of living at home may be alleviated by
the individual being in a safe, warm environment with food provided. This is not to
say that this is a ‘better’ outcome, but a qualitative study of the patient may give
different but equally valid results to an investigation into the speed with which a cure
may be affected by different products. In contrast to this are other aspects of the
treatment which may be considered negatively from the patient’s perspective such
as embarrassment and loss of control. Investigation into this aspect of the patients’
experience may be used to inform improvements in the way a treatment is carried
out as well as for example the choice of materials or drugs used. This example is
given not to suggest that any particular outcome is better, but to illustrate that there
is more than one way of ‘measuring’ a situation, one qualitatively and one
quantitatively, both of which can give answers one from a scientific medical
perspective and one from the social or human aspect.

In health then, as in education, one can argue that there is a place for a movement
towards qualitative research. Ng and White (2005) studied a radiography peer
reviewed journal to determine which qualitative research designs were been used.
They acknowledge that while qualitative research in radiography does exist, it is in
the minority compared to quantitative studies but that there are a wide range of
topics which could be investigated.

Is description and explanation real research?

The initial view of qualitative research for a positivist may be one of scepticism as it
is about asking questions which may not give what is assumed to be a ‘real’ answer
and may be perceived or processed by the questioner as different to the answer the
questioned person intended it to be. At this point the positivist may think it is all a
waste of time as it is not ‘real’ research giving ‘proper’ answers that can be
extrapolated for research purposes for example as reliability indicators. However,
this paper argues that even for a positivist there may be a way of reaching
understanding of qualitative methodology and moving towards a different ontology
using the ideas outlined here.

Using metaphors from quantum physics to discuss measurement, the reader is now
asked to suspend disbelief to see the similarities between ‘scientific’ and qualitative
measurement. There is no intention to directly compare humans and social phenomena with atomic particles in a grand theory of everything (of which more later) but to use quantum physics as a metaphor to take the sceptic to a position of understanding, and acceptance of a different ontology or way of observing the world.

Close (2004) explains how matter is made of atoms, which have been found to be made of ever smaller particles held together by forces. But the more that has been discovered about atoms, the more complex have become the theories to try and explain the particles and the forces which govern them. It seems more likely that a grand theory or grand narrative of matter is becoming not only more complex, but more elusive as each small discovery and explanation legitimately adds to knowledge as a whole but not to a theory as a whole. As chaos theory enters pure science so there is a move from finding an overall ‘theory of everything’ to finding the ‘micropatterns of disorder’ (Marcus and Fischer 1999 p8).

Lyotard (1984) is the proponent of the postmodern way of thinking and he argues against ‘grand narratives’ or universal truths of everything, and that science holds all the answers. Thus the postmodern qualitative investigator only needs to reveal a small aspect of reality which may not be generalizable to other parts of reality (Delamont et al. 2000). In other words the postmodern thought is that finding a unifying theory of everything as suggested above is not necessary or even possible.

This paper suggests that a similar approach to qualitative, descriptive types of research as a collection of truths rather than a theory of all sociological actions can be taken. As pure scientific endeavour moves from grand narratives, so it may be possible to accept that they do not need to be found for non-scientific or descriptive research although they have previously been proposed and subsequently dismissed (Marcus and Fischer 1999).

The weak and strong forces which hold together subatomic particles appear to exist only within the dimensions of the atom. So while being ‘real’ they only have a relational influence on matter in a very small area. Thus, in the microscopic world of science a finding or phenomena can be real and ‘true’ in its environment but does not rely on having an influence on things outside its own sphere for its’ being. Using this idea in the macroscopic world, a phenomenon seen in a social situation can be perceived as real in its context in its intra-relationships, and does not need to be
observed in any or every other situation to verify its being. If this is the case there is no pressure on the researcher to discover the ‘theory of everything’ in qualitative or social research as each small piece of new knowledge can be treated as legitimate by itself. The researcher is freed from the need to find a sociological ‘Higgs Boson’ to explain everything!

The scientific method of enquiry has been given a privileged status due to it being established as a dominant and powerful discourse, as a true path to knowledge (Usher and Edwards 1994) and by implication as being of benefit to all. The experiments within an empirical/positivist framework are assumed to have reliability and validity as they can be reproduced and give the same result and measures (Golafshani 2003). By contrast in a qualitative study real-world settings are studied and the findings used to discover and understand a social phenomenon, like the patient with the bedsore.

There could be further difficulty for a positivist to accept qualitative research as valid if they are concerned with the idea that how a person answers questions posed by a researcher may be affected by factors such as how they want to be perceived as they perform their identity which could affect how they want the interviewer to perceive them. In turn, the interviewer receives the participants’ replies but analyses them according to their own beliefs and preconceptions. They then write up their results which may be subject to influence from how the researcher wants to be perceived by their audience, for example the influence from knowing the audience, the funding body or their peers. Lastly the reader takes in the research findings and reads and interprets them through their own beliefs and ideological filters. At this point it seems that the gap between the message first given by the subject and the way the reader has processed it could be at variance. However, as the next section will attempt to show, just because something is measured or perceived differently by different observers, it does not mean that the validity and reliability of the original utterance is anything more or less than a ‘truth’ in that situation and to those participants.

*Moving from something that may be understood by radiographers (positivism and physics) to something new*
How can something understood by a radiographer be used to illustrate this idea of something being more than one truth or reality at once? The next section will consider the wave/particle duality of photons.

Barad (2007) based her work on epistemology and ontology on her interpretation of Bohr’s theories of wave/particle duality. Someone who has a science background will probably have encountered the theories of particle physics, and can ‘believe’ that sub-atomic particles exist and have unique properties through study of quantum physics. In short, depending on what apparatus is used, photons can be measured as waves due to diffraction properties but can also act like particles as they can be shown to have momentum in the photoelectric effect. Here a thing that exists, the photon, can be interrogated or measured, and will give a result that it is either one thing or another, but it is the same thing (a photon) being measured in two ways, not two different things. Importantly the apparatus used to find these differences in the behaviour of the photon or particle are themselves constructed differently in each case. Particles with a mass such as electrons will also give results that show they are behaving as waves.

If this analogy is taken to measuring social phenomena, then depending on the method or measuring apparatus used to interrogate or measure an aspect of their beliefs, a different answer may be discovered for each measuring tool, but the subject and their beliefs, remain as one. For example if two researchers ask the same questions, or one researcher asks questions in two different ways, the results may be different, but still represent a measure of the subject. The result discovered is shaped by the measuring instrument, in other words the result and the measuring device used to produce it are entangled (Barad 2007).

Another example is Barad’s (2007) interpretation of Heisenberg’s (1927) uncertainty principle whereby knowledge of a particle’s position and momentum cannot both be known at the same time as it is impossible to devise an experiment to do both at the same time. Using this metaphor it is suggested that exploring a social phenomenon for example by interviewing might only reveal part of the story or truth for that interviewee, but only knowing part of a truth does not make the information any less valuable as something new about the interviewee is discovered.
As above, when the electrons around an atom are measured, it is not possible to know simultaneously their position and momentum. It can be said that they are there ‘somewhere’, but only glimpses of where are possible depending on how they are measured. Similarly with qualitative research, it is possible to know that the truth or multiple truths are there somewhere although only one facet or aspect may be made clear. For example each human has several identities, one person can be a mother, a daughter, an employee, a consumer and many others. The identity that a person presents to a researcher may be an individual’s performance of how they wish to be seen combined with what they perceive to be what the researcher wants of them indeed Foucault (Kendall and Wickham 1999) suggests that an individual invents their identity as a performance for consumption. Like measuring the electron, only part of the whole picture about a person can be known at any time, but knowing only a part of the whole does not reduce the value of that knowledge about the person.

So one can argue that an experiment or interrogation in any paradigm does not reveal the truth that is in existence but reveals the truth that is being measured, as defined by the measuring tool or apparatus, and of which only a part may be discovered.

Assuming that qualitative methods of enquiry can be seen to have value, the next section discusses some of the methodologies available to the researcher and suggests a short-cut from the elusive and ever expanding nature of quantum physics theories to the elusive nature of defining ‘art’.

**A Range of Paradigms**

There is a wide range of methodologies from which the researcher can choose as a best fit for their research and for their paradigm. The aim here is to help increase the number of these which may be considered, moving from positivism and post-positivism paradigms whose proponents tend to use quantitative methodologies to an understanding that there is a welcome proliferation of paradigms (Lather 2006). Lather tabulates a range of paradigms but does not rank them, believing them all to be legitimate. Similarly Niglas (2001) suggests a range of paradigms with a corresponding range of methodologies, although none of these are fixed and determined. At one side of the range Niglas (2001) places quantitative research with
its accompanying philosophy of positivism and experimental investigation. At the other end of the spectrum sits qualitative research with its phenomenological and hermeneutical philosophies and postmodernism using investigation through hermeneutics and narrative research. This model suggests that the two methodologies are at opposite poles and that a journey across the paradigms is necessary to meet the goal proposed in this paper. However, a shortcut is proposed. At one side, the ‘science’ side is where quantum physics and chaos theory is situated while at the other end is the chaos of postmodernism’s small narratives and the idea that seeing something from different perspectives is valid, as proposed in this paper. The suggestion is that it is possible to move from one end to the other ‘round the back’ without struggling across the paradigms, moving from one area of chaos and increasing micronarratives straight to the other area of proliferation and small narratives. This short-cut allows the positivist researcher to become more comfortably involved with qualitative methods as they are only a small step away from their current paradigm.

**Ethical considerations**

Oliver (2003) suggests that while there are many areas in research where ethical considerations are important, for example respect, avoidance of harm and informed consent, there are some situations in qualitative research in which they are particularly important. In education as in health, participants may be children or have reduced capacity to understand and give consent so discussion with parents and carers outside the research need to be included. With all methods of research permission will be required from the institutions involved as well as the individuals. There can be no compromise on ethical permissions and procedures for if qualitative methods are to be perceived to be valid research they should rightly be treated the same as quantitative research.

**Future Impact**

Teaching research at undergraduate level may not be the place to introduce a wide range of methodological questions (Punch 1998), but while students may be taught quantitative methods including statistical analysis, perhaps equal weight should be given to qualitative methods to avoid students, often from a science based
educational background, from becoming polarised in their paradigm before having a chance to explore and develop other views.

Lather (2006) proposes however that postgraduate research teaching should encourage the problematisation of many issues in research, including objectivity and validity amongst others. Lather nonetheless recognises that in educational research there is a political pressure on researchers to provide work on which evidence-based practice can be based, and this sentiment is echoed in healthcare.

Taking these alternative approaches in research into the clinical workplace will be the next step. There has been considerable difficulty for clinical radiographers who want to do research including staff shortages and lack of funding (Probst et al. 2011) although there is now considerable support from the UK professional body. It is suggested that there is considerable scope within radiography to use qualitative research to investigate the human factors in addition to the technical factors which have been subject to a considerable number of studies, not only by radiographers but other professions with an interest in the effect and uses of ionizing radiation and imaging.

**Conclusion**

Without endeavouring to critically address the theories of qualitative research but using a simplified understanding of it, an attempt has been made here to move radiographers and other science based professionals from a positivist paradigm to consideration of a post-positivist position and beyond through comparisons between quantum physics which may be understood by a ‘scientific’ mind and social interactions, the investigation of which may be more difficult to conceptualise, so that qualitative research can be seen as having value. That value has been shown to be in describing, understanding and explaining one small part of ‘reality’ and is not to be seen in competition with scientific study. Embracing the postmodern gives the clinical researcher permission to find meaning and significance in one small part of reality and not worry about whether they can turn it into an overarching theory of everything because according to Lyotard (1984) the era of the grand theory or narrative is over and there is no one reason or meaning but many to try to explain social life and the professional practices that inform it. The importance of embracing qualitative
research in science based professions is to explore the social interactions happening alongside the treatments and therapies given or done to people and those experienced by staff, patients and carers so that their voices and stories may be heard and understood. In education there is an opportunity to challenge the positivist paradigm at an early stage of a student’s professional career and to increase the amount of qualitative research being performed, understood and applied throughout their careers.

References


