Research ethics and integrity: What should be on the agenda[1]?

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Abstract

This paper reviews the complexity of and challenges associated with research ethics and integrity. The author builds the research on four hypotheses which are literature informed. The paper is based on a qualitative research approach where the focus is on scholarly review of texts. This study departs from the important role (postgraduate) supervision is playing in the development of a researcher's career. The author argues that this is a central activity that can secure the development of a research culture informed by ethics and integrity. Closely linked to this is another central feature of academic life, namely scholarship. The author argues that scholarly training can avoid the pitfalls of scientific misconduct. The paper also presents-some markers for a research ethics code and a possible code itself. The view is promoted that researchers should be educated and trained in research ethics codes. The paper concludes with the view that motive is an inner driver for ethical behaviour. The motive should be an expression of the researcher's response-ability.

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1. Introduction

Around the world research is regarded not only as one of the university's core functions but it is also seen as (i) important to the knowledge economy and (ii) the intellectual growth of society. Without research – it is said – there can be no reference to intellectual life. Research is therefore not only needed by society but also held in high esteem. Hence the call for research ethics and integrity is well understood.

The integrity of scientific practice also obvious from a scientific perspective. Werner-Felmayer (2010:330) says that there is a general agreement that science is a "self-verifying system, a strictly logical and objective process discovering the truth". He then observes that the scientist should have the following behavioural armour: "The ideal scientist should therefore be honest, fair, open-minded, flexible, attentive, self-critical, dedicated, self-disciplined, responsible, motivated, ingenious, modest and mindful."

A perspective from another angle confirms the importance of research ethics and integrity. Murray (2009) reflects on the social benefit that higher education has. She is mindful that there are also individual benefits such as better income and career opportunities. But, social benefits such as social capital, an active citizenry, health and well-being are all spin-offs from higher education and outweigh the individual benefit. The first conclusion that can be drawn, is that these benefits should also be of an ethical nature. If this is true, one can make another conclusion, namely that research as core activity in higher education also has its benefits for both the individual and society and hence both the researcher and his/her research should be of an ethical nature.

But, regardless this common understanding, evidence suggests that research is often challenged by questionable practices such as plagiarism, misuse and misinterpretation of data, risky safekeeping of sensitive data, scientific misconduct during the execution of the project and the way in which participants (whether humans and animals) are treated. When one studies what research ethics and integrity are, then it is obvious what is expected from researchers. Research integrity can be defined as the trustworthiness of research due to the soundness of the way in which it is conducted and the honesty and accuracy of its presentation. Research ethics is understood as the principles, norms and values associated with the conducting of research. Research misconduct is known as the breaching of the research code and deliberate wrongdoing in the research

process. A lexicon of principles and applied practices exist to form a broader understanding of research ethics and integrity (see the Singapore Statement on Research Ethics and Integrity, 2010 and paragraph 7).

Debateable issues are whether (i) researchers and administrators have a shared understanding of research ethics and integrity, (ii) the scope for research ethics and integrity is well understood and (iii) why researchers are occasionally (unconsciously) guilty of scientific misconduct? These three issues (and more!) are captured in the question: *What should be on the research ethics and integrity agenda?* This agenda refers to what should be done to promote a culture of research ethics and integrity. In this paper, this question will be the subject for discussion.

2. Research focus and applied methodology

The focus of this paper is to understand the agenda for research ethics and integrity to promote a research culture supportive of ethics and integrity. A number of hypotheses inform this agenda:

- The lack of scholarly orientation and activity leaves room for scientific misconduct.
- Postgraduate supervision is often trapped between poor scientific practice and conflict of interest.
- Research defined as economic, industrial and commercial value demand new principles and values to guide the research process.
- Research ethics should be seen rather as an enabler than a regulator.

The debate in this paper will be informed by a qualitative text analysis based on Mouton's (2001) notion of the literature review as scholarly review. The scholarly review embodies an own interpretation of and reflection on existing literature. This interpretation and reflection are based on critical engagement with the research topic. A scholarly review normally follows a narrative approach and is part of the qualitative research method.

3. Unpacking the hypotheses

The four stated hypotheses need to be unpacked.

The lack of scholarly orientation and activity leaves room for scientific misconduct

In a changing university environment competitive advantage, public image and networks are core to the university's activities. The view is sometimes upheld that academic outputs such as philosophical papers are less

valued. Funding policies focus on output and not on processes or achievements. Researchers are more exposed to language such as product development, commercialisation and customer satisfaction. This leads to a situation where the perception is created that scholarly work is taking a backseat. The net result is that people are trained to be researchers and not educated in their disciplines. This can easily lead to a situation where rigourous engagement with research is largely absent which – in return – can lead to the erosion of academic practice. This can easily turn into a situation where scientific oversight can result in scientific misconduct. Proper scientific training can avoid such a situation. Here the author is informed by David Goodstein's metaphor of a *scientific immune system.* Werner-Felmayer (2010:330) sites him as follows: "Science is self-correcting in the sense that a falsehood injected into the body of scientific knowledge will eventually be discovered and rejected." Although many errors in the scientific peer review system can be identified, it remains a valid instrument to engage with a peer's research. After all, a science career is made of how other review one's science (peer review). Robust research engagement by one's research community remains a prerequisite for quality science (Green, 2010b:13).

Postgraduate supervision is often trapped between poor scientific practice and conflict of interest.

Postgraduate supervision is one of the essential research activities in the research cycle. Evidence suggest that poor supervisory practices prevail which resulted in the non- or late completion of studies. Sufficient case studies exist of supervisors using the students to maintain their research projects and labs (cheap labour!), to get promotion, or to gain financially from the process (Schrag, 1999; McCook, 2009). Such practices leave the room open for scientific misconduct.

Research defined as economic, industrial and commercial value demand new principles and values to guide the research process.

A major concern in the urge to commercialise research is the question whether university research is still of an academic nature, is it a business, or have university and business objectives merged? A typical example informing this question is the university as corporation. Third stream income as a result of triple helix partnerships underpins a new understanding of research. Research is no longer limited to the search into meaning only, but extended to the creation of artefacts as a result of

identified solutions. Viale and Etzkowitz (2010:3) point to academics' fear that the capitalization of knowledge to pursue innovation will "diminish the university goal of knowledge production *per se".* They also comment on the ignition of firms as entrepreneurial academic activities intensify. The challenge is that these firms may no longer be tied to a particular university (Viale & Etzkowitz, 2010:11). This may be fearful to many academics because they are not familiar with this new working environment.

Research ethics should be seen rather as an enabler than as a regulator

Ethics is neither quasi religion nor a barrier to activities. Ethics is an enabler to assure that research is well accepted and perceived by the public as end-users of the research project. Ethical clearance is no guarantee that the research results will not be misused. The requirement for ethical clearance is not to place a hurdle in front of the researcher, but rather to make the researcher aware of possible pitfalls in the research project. A study on "Enhanced Interrogation Techniques" used to get information from (war) prisoners pointed out that ethical approval was based on bad science. The authors find that "The science used to justify torture was bad because it repeatedly failed to assess important long-term physical and mental health outcomes ... The science was also bad because it violated the most basic tenet of medical ethics and scientific inquiry – *primum non nocere* – first, do no harm. Scientists and health professionals must hold themselves to the highest professional standards of commitment to the human rights and dignity of the people whose lives they have the privilege of serving" (Iacopino, Aalen & Keller, 2011: 34, 35). One more comment supports this hypothesis. Grant looked into individuals who have been blackballed by the American Food and Drug Administration. He refers to them as "biotech baddies". He commented on their acts and quoted James Sheenan, New York State Medicaid Inspector Genera l saying: "The FDA debars people as a remedial action and not as a punishment" (Grant, 2009:50).

4. The paradigm shift in the agenda for research ethics and integrity

The typical understanding of the agenda for research and integrity is (i) approval is needed to do research on human subjects, (ii) plagiarism is intellectual theft, (iii) data can be misrepresented through the fabrication and/or falsification of information, (iv) informed consent facilitate the aim of

the research where people are involved, (v) conflict of interest exists where there is an unfair personal gain in doing the research and (vi) no harm should be done to any object and/or subject participating in the research. This typical understanding can be labelled as a *collegial approach* when doing research.

New developments in the research culture enlarged the scope for research ethics and integrity and hence the complexity thereof. The next few examples support this statement.

(i) The financial gain from research questions how researchers are dealing with human and material resources when doing research.

(ii) Ongoing commercial activities query whether the activities are driven for financial gain or the development of new knowledge.

(iii) Research on human subjects changed to research with human participants – this accommodates clinical, therapeutic, biographic and evaluative research.

(iv) The environment is an ecological concern and calls for sustainable and safe practices.

(v) Animal rights are becoming as challenging as human rights.

(vi) Evaluation by peers should be independent, not biased and removed from any personal gains.

(vii) Staff and student training should be based on recognised scholarly practices linked to proper career path planning.

(viii) Research has become a profession in its own right. Professional ethics should therefore be understood in juxtaposition to research ethics.

(ix) Research facilities should be used in such a way that it evokes no fear or harm to anyone. No research facilities should be used for own benefit only.

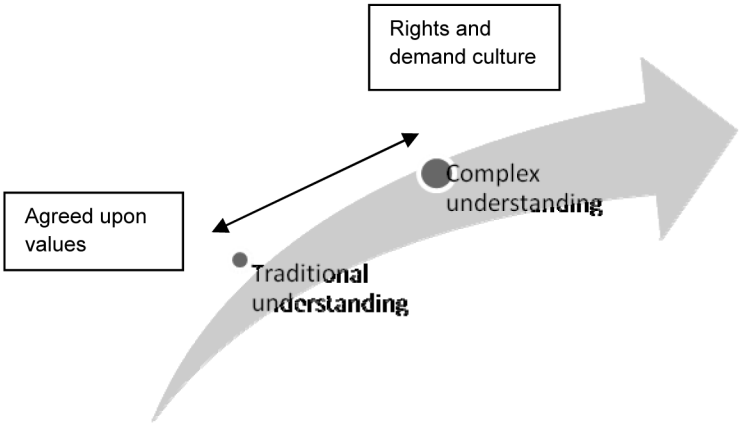
(x) Although research is in the public interest, disclosure of information can never put confidentiality aside.

These new challenges (and many more) sparked many more challenges. Lately words such as compliance, regulation, assessment, etc. are part of the research culture. The problem, however, is not with these actions, but that these actions are promoted to the level of ethical practice – which they are not. The concern is not with the conceptual understanding of these

actions, but that they are regarded as the only ethical guardians of research – if you have policy in place and if you comply too it – then the research is ethically sound. To comply is firstly a legal action. Noncompliance can be an ethical issue but the act of compliance is a regulatory matter. An additional worry is that the perception can easily be created that if one complies then one has addressed all ethical issues. Ticking a box is however no quick fix or remedy for a lack of ethical behaviour.

Noteable in the shift from a traditional to a more complex understanding of the research agenda is the emphasis on human and animal rights and environmental and business demands. One can therefore typify the current research agenda as a rights and demands agenda. Rights and demands can coexist in a culture. The worry is when demands are appreciated as rights.

The next graph illustrates the complexity of the research agenda:



Graph 1: The shift in the research agenda

5. The value of scholarship

A central argument of this paper is that good scholarship can avoid scientific misconduct. The author is arguing that scholarly reflections and engagements can avoid that the researcher falls prey to a lack of ethical behaviour. The argument is built on the claim that scholarship is a trademark of a good researcher.

Scholarship can be defined as intellectual craftsmanship. A scholar is a person who can profess on his/her knowledge. In the fashion of the Monastic

Order to "profess" is to speak and practice the truth. The truth is seen as those intrinsic values associated with one's scientific discipline. To speak and to practice scientific truth are based on knowledge and scientific skills. "Understand" and "apply" would be the keywords describing scholarship.

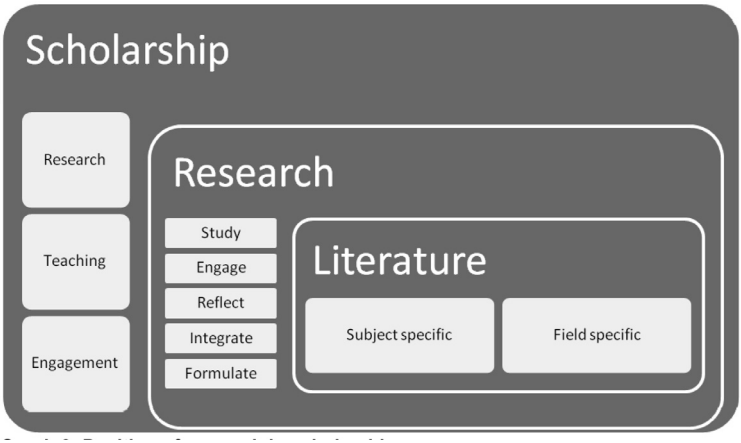
In developing the idea of intellectual craftsmanship a number of requirements can be formulated to build it on (see Lategan, 2010). These requirements can be articulated as follows:

- Learned (and not simply familiar with) in one's field of study. The history of one's field of study is essential to understand trends, developments and paradigm shifts. To be educated in one's field of study implies that one can reflect on existing debates and formulate an own perspective.
- Schools of taught, religious conviction, philosophical orientation and societal ideologies cannot be ignored in science. The art is not to avoid them but to recognise their impact on science. An additional competency is to comprehend the context within which research is presented and to reflect from one's own paradigm on existing knowledge. Habermas' concept of "communicative dialogue" is appropriate here. The issue is to understand and interpret (hermeneutics). Discovery is what scientific rigour is all about.
- Contribution towards one's field of study. Too many evaluative studies are presented as research – which it is not. Research is not a repetition of what is already known. The marketing concept of the "re-packeting" of knowledge could perhaps apply to the application of knowledge but not the creation of knowledge. And yet even in the application of knowledge to practice a new discovery should be made and insight gained in order for it to be labelled as research.
- Integration and application of knowledge frameworks and data ranges are supportive of enlightening scholarly work. State of the art research involves Multi-disciplinary, Inter-disciplinary and Trans-disciplinary Research. Also, science is evolving in a new direction referred to a as "Polyvalent Knowledge". This concept refers to unifying knowledge – instead of dividing knowledge into different spheres, a unified approach to knowledge is followed. This means that different *spheres of knowledge* (applied, fundamental, technological) or *modes of knowledge* (Mode 1 – disciplinary knowledge or Mode 2 applied knowledge) are growing into a unity (Viale & Etzkowitz, 2010: 3,4).
- Problem-solving is not a given in all research. Problem-solving straddles a range of activities: understanding what the problem is, how to solve the problem, what new solutions can be provided through problem-solving and fol-

lowing from the latter, what new problems could be identified? Original research depends greatly on the kind of questions posted in the research study.

- Intellectual virtues can strengthen scholarship. Mowbray and Halse (2010:657) explored the significance of Aristotle's intellectual virtues for research. Aristotle emphasised the value of *practical* knowledge (*phronesis*), *theoretical* knowledge (*sophia*), *scientific* knowledge (*episteme*), *productive* knowledge (*techne*) and *intuitive* knowledge (*nous*). These values are all complementary to the unity – using "Nussbaum's metaphor of jewels fitting into a crown". The process in acquiring these skills should be emphasised (Mowbray & Hale, 2010:662). They argued that these virtues have the possible advantage of experience capturing and preparation for the world of work (Mowbray & Hale, 2010: 662).

Boyer's four quadrant approach to scholarship (teaching, discovery, integration and application) is useful to contextualise scholarship. Scholarship is not limited to research only. It should influence teaching as knowledge transmission and engagement as knowledge application. In this sense research is central to scholarship[2]. The next graph illustrates the position of research in scholarship.



Graph 2: Position of research in scholarship

2 I am mindful of the (ongoing) debate on the nexus between research and teaching, whether a co-existence is possible in all disciplines or if teaching activities are not more important than research activities. Reference can be made to Shapper and Mayson's (2010) discussion of this issue and their proposal for "from fractured engagement to a marriage of convenience".

This doesn't mean that scholarship is easy to achieve or to apply. In addition, scholarship is also an open concept that needs contextualisation and application. The search for scholarship is a deep learning curve and therefore an ongoing pursuit. The following comments can be offered to support this observation: the absence of a curriculum for postgraduate assessment can leave the door open for inconsistency in recommendation between external assessors or the way in which the thesis/higher degree committee/etc. deals with the final approval of the study. Holbrook, Bourke, Lovat and Fairbairn (2008) confirm in their study that although the doctoral curriculum is "invisible", evidence suggest that there is a global understanding of what constitutes a good "Ph.D.". One can argue that the robustness with which a study is being tackled, contribute to this understanding. Applying this to scholarship means that doing the research should be novice in defining the research problem, delineating the scope of the project, identifying the appropriate methodology, integrating the conclusions and applying the knowledge. Such an approach will require ongoing education. One way to deal with this is to be exposed to multiple learning opportunities. Hopwood (2010) argues that non-formal learning through academic work such as editing journals and reviewing papers may contribute towards their understanding. Learning should take place in many ways. Research has shown learning outside formal settings can be of extreme significance. Hopwood is therefore not arguing for a replacement of formal criteria – he is instead advocating that formal research education be complemented with various learning opportunities.

A useful idea to sustain scholarship is for Ph.D. students to take an oath upon graduation. Such a code can morally commit them to the profession that they are about to pursue.

6. Reflections on the debate: in discussion with the Singapore Statement

The second world conference on Research Ethics and Integrity was presented in Singapore in 2010. During this conference a framework for Research Ethics and Integrity was debated and discussed amongst participants. Based on the discussion a Statement was formulated to which the delegates agreed to. This Statement is referred to as the Singapore Statement. What is noteable from this statement is:

- The preamble of the Statement is taken in integrity: "The value and benefits of research are vitally dependent on the integrity of research."

Integrity is defined as the trustworthiness of research. Although differences may exist between national systems of research, there is enough common ground that researchers can associate themselves with to secure ethically informed research.

- Scientific misconduct has a chain affect. It does not only relate to unethical behaviour but also questions the way in which the research was done and/or presented. The effect hereof is that the public – as end-users of all research results – question the sloppiness of the research conducted. In return the public mistrust in scientific endeavour will lead to a decline of public funds to do research. Also, mistrust in scientific ability is as negative as the effect of harm and risk on a community as a result of research.
- Good research based on appropriate research methods is essential. Sound research is a prerequisite to ethical research.
- Results should be kept in such a way that it is open for verification and assessment.
- Authorship is meant for those people who meet the criteria for contributing to a publication. Authors should take responsibility for the conclusions and recommendations. It should be based on vigorous research. Peer review should assist with the integrity of the research through enthusiastic engagement with the research.
- Conflict of interest or potential conflict of interest should be reported at all times.
- When researchers engage with the public, their professional opinion should be clearly separated from their personal views and opinions.
- Researchers should report scientific misconduct. Appropriate mechanisms should exist to report such misconduct. An environment conducive to research integrity should be created at all times.
- Research risks should be weighed against social benefits.

This Statement will inform the formulation of ethical guidelines and an ethical code (see sections 8 and 9).

7. The problem of greed

It appears that *greed* is the biggest ethical problem in research. Greed is not limited to financial gluttony only, but exists quite frequently at the intellectual level. Examples of always wanting more than what the norm is, are financial

gain from possible intellectual property and commercialisation, claiming credit for work not done (or not so extensively engaged with) and not sharing information that can benefit another group and/or society.

The problem with greed is that it is not tangible and can often not be measured. Greed often originates from collegial or supervisory power play. The senior colleagues who demands his/her name to be added to a project just because he/she is the project leader is unethical. The motivation is that the project is linked to their names, that they landed the funding or that their name will give more creditability to the research. The supervisor who claims credit for an output without engaging comprehensively with the process; supervision in cases where there may be a personal relationship with the student and students who fail to make sufficient progress with their projects because of the absence of supervision, contribute towards the lack of integrity in the research project.

Greed should not be confused with a competitive spirit. The problem is when winning at all cost is the only motive. The problem deepens when the researcher wants to be the top achiever without making an equal contribution. Linked hereto is the problem where researchers may be of the opinion that they are not remunerated sufficiently and they have to "reward" themselves. They may believe this is no financial theft and hence acceptable. But, theft of an intellectual nature is as bad as financial theft. The difference is in the adjective – not in the motive.

From ethics discourse it is a known fact that motive or intent plays an important role. Researchers should therefore continuously assess the motive (deepest motivation why they are doing things). This should be a self-assessment activity to identify in what way are researchers meeting ethical behaviour?

8. Possible markers

In supporting a research culture, the following markers can be regarded as important:

- In the debate on understanding what research ethics is, research and ethics should be conceptualised. Research in this paper is defined as searching for new knowledge and answers to identified problems. This is based on the French word "*recherchér*". Ethics is the study of principles and values influencing human behaviour, judgement and lifestyle. Research ethics are those accepted principles and values informing the normative execution of research.

- The word “Ethics” derives from the Greek “ethos” which refers to home or a place that one feels safe in. An ethical environment should foster trust and safety – not fear. Ethics is the study of what principles hold good for society and how these principles should be contextualised and applied to society. Researchers have to formulate principles – and following from these principles – the values for scientific endeavour.
- Although various ethical frameworks exist all research should have a universal set of ethical guidelines. Researchers may differ on what constitute a framework for research ethics, but practices promoting unethical research or putting the integrity of the research into question should be avoided at all times. In a multi life- and worldview oriented society, strongly influenced by post-modernism, it will do a research community good to engage with what ethics is.
- Research ethics is no theoretical activity only. It is also about application. Once a decision has been taken it needs application. The application of a decision can, in return, also create ethical challenges. Ethics should also assist in finding the desired way for doing research.
- Administrators should be mindful that they can – unintentionally – promote ethical dilemmas and questionable practices. Known examples are to blindly respond to the needs/demands of funders or to promote a commercial example at all cost.
- Not enough discussion focuses on what science and research are. It is unrealistic to expect the growth of a research culture informed by ethics and integrity if such a discussion is absent. The questions “*What is science?*” and “*What is research?*” are not as obvious as it appears.
- Care when dealing with and/or reflecting on information, data and results are absolutely essential. Errors in statistical information refer to sloppiness in science. Inaccurate representation in research will result in poor science. Deliberate tampering with results is scientific misconduct.
- Gift and ghost authorships should be avoided at all times. Names of leading researchers should not be added to give more creditability to research. Research should be creditable in itself.

What these markers advocate is that (i) knowledge on what research, science and ethics is, is essential to understand the demand for a research culture informed by ethics and integrity. It also (ii) alludes to the trustworthiness of the process and that care is exercised in all research

activities. These markers also highlight (iii) that an ethical research culture is something that should be promoted and lived. It is also apparent (iv) that researchers' scientific endeavour are the most important building blocks for such a culture.

An ethical code will be proposed on the basis of these markers.

9. Discussion: an ethical code for research

It is proposed that researchers should subscribe to an ethical code when doing research. Such a code will comprise of the following pointers:

- Researchers should be honest, competent, transparent, responsible and trustworthy at all times. The principle of "do no harm" should be practiced.
- Research projects should be sound in nature and in practices.
- Authorship is owned by only those who engaged with the research results and conclusions.
- Peer review is to evaluate the research activity and performance and to authorise it. The quality of research is vested in the researcher.
- Data interpretation, data management and data sharing must be unbiased and not hide any findings that may influence the outcome of the research or its evaluation.
- Objectivity should be present at all times; a lack thereof can influence judgement and outcome.
- Duty of care should be applied to all humans and animals participating in research.
- Policies regulating research should be assessed and adhered to.
- Science has a responsibility to society (altruistic service) – it should therefore be relevant and complacent.
- All possible interest and conflict of information should be declared.
- Researchers should be subjected to continuous training to secure sound research and to avoid mistrust in the research system.

Codes for research should be developed, but researchers should also be educated and trained to use codes. Education and training should not be avoided when dealing with ethical codes. Education and training should raise the awareness of the "ethos of science". Prioritising the teaching of research codes and conduct have several advantages such as the strengthening of

procedures, increasing the funding possibilities from agencies to improve levels of surveillance, formalising responsibilities to editors to identify fraud, increasing penalties for those who are find guilty, etc.

One should also rely on people's sense for morality. Kant's sense of moral duty (deontology) – I do something because I know I have to and not that I must do it should also be promoted. This relates to the promotion of a *scholarly community*. The concept of a scholarly community co-insides with business management's concept of a *corporate citizen*. It must be remembered that people and not projects are funded. A closer working relationship between society and researchers are warranted. It is imperative to build a community of research leaders. Business people behave according to the norms associated with business. Scholars associate with the values of the academic society. Self-policing instead of being policed should be the driving value. The "ethos of science" cannot be ignored.

The academic citizen is not removed from Merton's notion of the "Republic of Science" (1973) or Polanyi's "Kingdom of Science" (1962). In the Republic of Science the positive role of science for communities are outlined. Technology is required for the competitive advantage it has in the application of new knowledge (Viale & Etzkowitz, 2010:221).

It should be clear, however, that codes don't make people honest – as illustrated by the well-known Enron saga and the economic misconduct at *Societe Generale* (see Lategan, 2008). Codes can simply raise awareness, common agreed principles and improved collaboration. The metaphor of a fire alarm can be used. It doesn't prevent the fire but it stops the spreading of the fire. The purpose of an ethical code is to improve and not to be a barrier.

It is important that practitioners and researchers work along to secure that the best decision is taken on a matter. Askew, John and Liu (2010) reported on how researchers' feedback was used in a design experiment to optimise its application. They pointed out that it is useful for the policy makers to listen to the researchers. They observed:

> Both public sector professionals and researchers can be satisfied that a design experiment is a feasible form of intervention, where both researchers and practitioners feel comfortable with the concept and the practice (Askew, John & Liu, 2010:595).

The discussions had a further advantage that the roll-out could improve based on the feedback by the researchers (Askew, John & Liu 2010).

The role that Scientific Societies can play in promoting research and integrity should not be underestimated. Scientific councils can at least assist in (i) general education and professional development, (ii) prevention and advertisement and (iii) complaint handling and enforcement of codes of ethics.

Gawrylewski (2009) encountered problems with Ph.D.'s student scientific misconduct. "Many labs can inadvertently become breeding grounds for fraud and research misconduct, mostly thanks to lax supervision and high-stress environments." On the basis of this encounter, he identified twelve pointers to cultivate a fraud-free lab: (i) Weekly lab meetings should be organised where people can report results and progress. (ii) Data should be assessed to verify if the necessary controls were implemented. (iii) Records should have detailed notes. The records should tell how the students arrived at the results. It is adviseable not to look at the results only. (iv) Data should be shared although security measures to safeguard the data should be employed. (v) Principal Investigators should listen attentively to students to really know how they are doing. (vi) Open channels should exist were conflict can be discussed. (vii) A contract with new students / staff will emphasise the importance of the research activity and its seriousness. (viii) The rules should be followed by all in the labs. (ix) Research should realise its limitations and care not to have an overload of activities. (x) Research leaders should be fair and professional. Some students should not be favoured above other students. (xi) Activities should be promoted where students can engage on matters of research interest. (xii) Avoid drawing conclusions on any allegations made.

Well-educated and trained scientists are much needed for the "open science movement". Open science does not only make research findings (including data) available but also develop infrastructure that can support networks. In this sense does it drive science forward (Greene, 2010b:13). These comments illustrate that a (research) ethics code is something that should be lived, harmonised with its practitioners and subjected to ongoing debate and improvement. The importance of such a code is a given fact, the contents dependent on dialogue and the application thereof on uninterrupted practice.

10. Post script: response-ability

Ethics is very often associated with responsibility (for example Emmanuel Levinas, Hans Jonas, Willem Velema, etc.). Responsibility portrays the idea that people act in such a manner that they and other people can

benefit from the action. In addition, the act (action) has no harm or risk associated with it. Where there is a possibility of harm or a risk the impact will be very low.

It may be more appropriate to refer to the need for *response-ability. Response* has the notion of how does one react to a situation and *ability* is the means and the empowerment to do so. A range of ethical figures can be associated with response-ability:

- Ethics embodies care – the way in which one will response to a given situation (example the protection of equipment and facilities) will push for a caring approach. The desired ethical behaviour is that whether one owns the equipment and facilities or not, they need to be cared for. To care for a material thing is not to use it for a purpose not meant for it,or to use it in such a way that personal gain and benefit will follow. Again will Kant's idea of moral duties be applicable here.
- Ethics focuses on relations. Ethics is never about one self but always about guiding the relationship one has with other people, the environment, culture, organisations, etc. It is through the interaction with other people and society that relations are built. The relations are built on the basis of mutual response. In fostering an ethical culture people should also learn how to deal with it. Ethics is often regarded as far too abstract to be taught. "You can teach people what the principle is, but not how to live the principle." But, ethics is taught through example. By learning the art of ethical behaviour, one masters the nuances of an ethical life. In this way people become able to respond to the desired behaviour.
- Ethics teaches that one's attitude influence a situation – either positive or negative. Researchers are often blamed for arguing a situation "right" instead of living up to what is expected from them in a situation. Attitude is very often influenced by one's world and life view. The challenge for researchers is firstly to understand their own attitude and then working on the attitude. A concern in academic life is that endless opportunities exist for intellectual growth but there are limited opportunities to frame the normative context for the intellectual growth.
- Ethics is finding solutions to troubled situations – for example where scientific abilities can be used to promote wrong-doing (example bio-terrorism). The science may be good but its application can destroy the lifes of many people and the environment. Ethics needs to point out where people and their society face harm. Ethics should also direct

scientists not to engage in harmful activities. But it should also identify appropriate ways to correct (and punish) those liable of scientific misconduct.

- Ethics is self-regulation. A remarkable achievement for any one is to have insight into your own makings. This is only possible if one is open to self-assessment. When one analyses and assesses what one is doing, then there is the opportunity to self-control and also to correct behaviour. Self-assessment is not about achievements only – it is all about how one has arrived at one's achievement. Process and activity reviews are therefore essential.

11. Conclusion: setting the agenda

This paper outlined what should be on the agenda of creating and fostering a research culture characterised by ethics and integrity. The central line of argument is that scholarship should drive such a culture. In the duty to scholarship one should avoid sloppy and careless research. Scholarship will also point out that it is all about new and original research, hence interfering with data, information and conclusions will not contribute to building a knowledge basis. Understanding the history of science will also teach one that a scientific tradition called for normative behaviour. The paper suggested that response-ability can create an environment where researchers realises that they must act (response) but that they need to grow their know-how (ability) to do so.

Bibliography

ASKEW, R., JOHN, P. & LIU, H. 2010. Can policy makers listen to researchers? An application of the design experiment methodology to a local drugs policy intervention. *Policy and politics,* 38(4): 583-599.

GALLAGHER, R. 2009. Editorial: fairness for fraudsters. *The scientist*, 23(7) (July): 13.

GAWRYLEWSKI, A. 2009. Fixing Fraud. *The scientist*, 23(3) (March): 67-69.

GRANT, B. 2009. Right your writing. *The scientist*, 23(11) (November): 65-67.

GREEN, S. 2010a. Editorial: three new paradigms. *The scientist*, 24(4) (April): 13.

GREEN, S. 2010b. Editorial: Peer review and the age of aquarius. *The scientist*, 24(8) (August): 13.

HOLBROOK, A., BOURKE, S. LOVAT, T & FAIRBAIRN, H. 2008. Consistency and inconsistency in PhD thesis examination. *Australian journal of education.* 52(1): 36-48.

GRANT, B. 2009. Biotech Baddies. *The scientist*, 23(4) (April): 48-53.

HOPWOOD, N. 2010. Doctoral students as journal editors: non-formal learning through academic work. *Higher education research and development*, 29(3):319-331.

IACOPINO, V., ALLEN, S.A. & KELLER, A.S. 2011. Bad Science used to support torture and human experimentation. *Science,* (33) (7 January): 34-35.

LANCIANO-MORANDAT, C. & VERDIER, E. 2010. In: Viale and Etzkowitz (Eds), *Multi-level perspectives: a comparative analysis of national R & D policies.* 218-242.

LATEGAN, L.O.K. 2008. Employing theological ethics to draft a professional ethic in research. *Ned. Geref. teologiese tydskrif,* 49(3&4): 177-192.

LATEGAN, L.O.K. 2010. 'n Raamwerk vir intellektuele vakmanskap – 'n filosofiese beoordeling. *Tydskrif vir Christelike wetenskap,* 46(3&4): 143-156.

McCOOK, A. 2009. Life after fraud. *The scientist*, 23(7) (July): 29-33.

MOWBRAY, S. & HALSE, C. 2010. The purpose of the PhD: theorising the skills acquired by students. *Higher education research and development,* 29(6): 653-664.

MOUTON, J. 2002. *How to succeed in your master's and doctoral studies.* Pretoria: Van Schaik.

MURRAY, J. 2009. The wider social benefits of higher education: what do we know about them? *Australian journal of education*, 53(3): 230-244.

PEARCE, W. J. 2010. Citations: too many or not enough? *The scientist*, 24(8) (August): 29.

SCHAPPER, J. & MAYSON, S.E. 2010. Research-led teaching: moving from a fractured engagement to a marriage of convenience. *Higher education research and development*, 29(6):641-651.

SCHRAG, B. 1999. *Research ethics: Cases and commentaries.* Vol. 3. Indiana University (Bloomington): Association for Practical and Professional Ethics.

SINGAPORE STATEMENT. See: Singapore Statement on Research Integrity.

SINGAPORE STATEMENT ON RESEARCH INTEGRITY. 2010. Downloaded from www.singaporestatement.com on 31 January 2011.

VIALE, R. & ETZKOWITZ, H. 2010. In: Viale and Etzkowitz (Eds), *Introduction: anti-cycle triple helix:* 1-27.

VIALE, R. & ETZKOWITZ, H. 2010. (Eds). *The capitalization of knowledge: the triple helix of university-industry-government.* Cheltenham: Edward Elgar.

WERNER-FELMAYER, G. 2010. Rethinking the meaning of being a scientist – the role of scientific integrity boards and some thoughts about scientific culture. *Medicine and law,* 29(3): 329-340.