

Integrating research ethics and integrity with research education: What are the issues?¹

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Opsomming

Die integrasie van navorsingsetiek in navorsingsonderrig: Wat is die kwessies?

Hierdie studie vertrek vanuit die standpunt dat die opleiding van 'n navorser berus op gehalte navorsingsonderrig. In praktyk beteken dit dat 'n navorser oor meer vaardighede sal beskik as wat tradisioneel met navorsing geassosieer word. Een so 'n vaardigheid is, byvoorbeeld, om eties te wees en die navorsingsprojek met etiese integriteit te doen. 'n Verdere uitdaging is om navorsingsetiek breër te verstaan as die konvensionele verstaan daarvan. Hierdie studie spreek twee sake aan. Eerstens die verstaan van navorsingsetiek in 'n omgewing waar industrie-gedrewe en kommersieel-georiën-

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teerde navorsing net so belangrik soos basiese navorsing geword het. Verder word etiek in 'n samelewing bedryf waar 'n menseregte-kultuur die botoon voer. Tweedens word 'n raamwerk vir navorsings-onderrig voorgestel. Hierdie raamwerk is gebaseer op die navorsings-waardeketting. In die konteks van navorsingsonderrig sal aangetoon word dat navorsingsetiek 'n onmisbare deel van navorsingsonderrig is.

Abstract

This article argues that in preparing a researcher for a career in science, it is fundamental that he/she is trained appropriately. In reality this means that the researcher should have more skills than simply those skills that are traditionally associated with research. One such a skill is to be ethical and express integrity in the research project. Apart from dealing with this challenge, another challenge is to move beyond the conventional/traditional understanding of research ethics. This article will therefore address two issues. Firstly, what the scope for research ethics should be in an environment where industry-informed and commercial-driven research has become as important as basic research and a society known for its human rights culture. Secondly a framework for research education will be proposed. This framework is based on the research value chain. In the context of research education it is highlighted that (research) ethics is an indispensable part of any research training.

Key words: Ethics, research, integrity and research education

1. Introduction: The common (traditional) understanding of research ethics

The common (traditional) view of research ethics is limited to:

- Fabrication of information and data
- Falsification of information and data
- Plagiarism
- Research on human subjects

The reason for this limitation could be found in the perspective that research must uphold the truth. Therefore to present results that are

either not trustworthy or taken without permission from someone else, is seen as odds with what is associated with research. In addition, research on human subjects is subjected to ethical protocols since research may interfere with human life, its abilities and potential. It is thus no surprise that medical ethics advocates the uniqueness of human life and that it should be treated with respect.

To demarcate research ethics to a few aspects only may be fit for an environment where research is primarily informed by qualitative, quantitative and experiential research methods. But, in a competitive society where the research agenda is no longer (exclusively) set by academics only but steered by business and industry, different challenges emerge. In addition, issues such as social transparency, diversity and development also challenge the research agenda. Researchers are now sensitized to include challenges from business, industry, government, the environment, animal rights, human interaction, etc. in their research. In addition, the question is increasingly asked how do research communities deal with the creation (*why?*) and application (*how?*) of knowledge. Does the research community reflect sufficiently on what the impact of their research might be? Consider the following examples: as global tension and aggression increased, for example through national security threats and global terror, the fear is that research can contribute to enhance this tension through, for example, chemical weapons. Environmentalists are protesting against genetic altered food. They too advocate – based on an own believe system impacting on people's perception of research - that research can cause more harm than good. The possibility also exists to clone people. The the proverbial Frankenstein Monster is therefore no longer a threat on paper only. But, it is one sided to blame all wrong only on research. The concern for society (which is also an ethical virtue) urges researchers to find solutions such as renewable energy, recycling, waste management, safety and security, poverty alleviation, etc. It is therefore not surprising to note from debates and publications that there is a growing interest in research ethics beyond medicine. After all research ethics deals with more issues than simply human life.

Apart from the growing interest on challenges beyond medical ethics

it comes as no bolt from the blue – this is idiomatic language meaning it comes as no surprise that research – as a growing economic and academic² enterprise – is high on the ethics agenda. Here one can refer to the growing interest in engineering ethics, technological ethics, food production and ethics, etc.

The emerging questions now are (i) what the scope of research ethics is and (ii) what should be on the agenda in practicing research ethics? In addition, the South African society is driven by a human rights culture. Following from this drive, another emerging issue is how to deal with issues where researchers interact *with* humans. The latter captures issues such as supervision of a family member / partner, issues of discipline (especially in a personal relationship) and greed (motive for doing research as a leading requirement for promotion and rewards). Linked to this are the challenges posed by sustainable development.

To top these challenges, the underlying question is *whether researchers can be trained to be honest when doing research?* At the heart of this remark lies the pedagogical question if people's unethical behaviour or absence of ethical sensitivity can be corrected through training? Also, if you train people is it on the basis of orientation (for researchers to be mindful of possible ethical challenges and risks) or content (deal with different themes and topics) or both? This article departs from the premise that researchers can be trained to be more ethical and to behave according to a chosen value system.

The objective of this article is to attend to the place of research ethics in the training of researchers – whether professional / academic researchers or students – hence by means of academic development or a formal curriculum.

2. Conceptual matters

In defining research ethics, the following should be considered (see for a broad-based orientation of ethics Badaracco, 1998; Donaldson

2 This dual assignment attributed to research refers to the drive that research should contribute towards the economic development of a society as well as to the accepted claim that universities should develop the knowledge basis through their research.

and Dunfee, 1999; Fisher, 2002 and Lategan, 2011; Ten Have, 2011):

- The word “ethics” derives from the Greek word *ethos* (ἦθος) which could be translated as one’s deepest motivation.
- Ethics entails much more than what is normally associated with an ethical code. Ethical codes are the expression of desired behavior expected from employees.
- Morality differs from ethics in that morality reflects expected societal behavior.
- Integrity cannot be separated from ethics. Integrity embodies the public trust in a matter.

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 inform a broader understanding of research ethics and integrity (see the Singapore Statement on Research Ethics and Integrity 2010).

Following on this conceptual presentation of what research ethics is, a next consideration would be on the influence of paradigm choice on understanding research ethics. In a diverse society the recurring question is “Whose (research) ethics?”³ Paradigmatic

3 This relates to what MacIntyre (2011) in “After virtue” struggles with namely what constitute our moral society and decisions. Ten Have (2011) also points out the different

choices that I am opposed to are *reductionism* and *postmodernism*. Reductionism negates the unique characteristics of ethics such as loyalty, respect, honesty as not important whilst postmodernism questions a chosen perspective as legitimate point of departure. The paradigm I opt for will be Reformed rationality. With this I mean that given creational structures / entities are used to analyse phenomena, practices, behaviour, trends, etc. This presupposition will be evident through-out the article⁴.

3. Foundational issues

Based on literature-informed research, a number of hypotheses inform the research ethics agenda (see Lategan, 2011):

- Research is still trapped between the *conventional* understanding of research (research problem seeking a solution) and the *commercialisation* of research (taking the solution to incubation and commercialisation, also known as transfer). Although some engagement with typical research ethical problems exists, a comprehensive analysis of research ethical challenges posted by the research cycle (a combination of the conventional and commercial understanding) is primarily absent. Here one can refer to issues such as conflict of interest due to business engagement, research that needs to provide the “required” answers for example the advantage of a specific drug, etc. It would therefore be safe to remark that research defined as economic, industrial and commercial value demand new principles and values to guide the research process.

views cultures and religions have on ethics. Burggraeve, De Tauenier, Pollefeyt and Hanssens (2008) also consider what constitute a society characterised by integrity.

- 4 I can associate myself with Wilson’s historiography of science and religion in which he described the “conflict thesis” in detail as possible hermeneutic key to understand and describe the historical relationship between science and religion. This relationship can be described through conflict, mutual support and total separation. Scientific religious traditions that are part of the broader debate on science and religion are Judaism to 1700, early Christian attitudes towards nature, Islam, medieval science and religion, orthodoxy, Roman Catholicism, Early modern Protestantism, Judaism since 1700, Modern American mainline Protestantism, evangelicalism, and fundamentalism, America’s innovative nineteenth century religions and Creationism since 1859 (see Wilson, 2000).

- The lack of scholarly orientation and activity leaves room for scientific misconduct. Scholarship lies at the heart of the academic portfolio. Scholarship requires several dimensions of academic engagement such as knowledge generation, transfer, application and development. Scholarship is built on rigorous academic engagement and not routine work. If scholarship is replaced by sloppy scientific practice then the academic ethos is abundant. Research can become sloppy when scientific rigour is absent in the execution of the research project. It is then that mediocre research methods are employed to present questionable research results. The quality of the scientific practice is expressed through scholarship. In the absence of quality driven scientific practices, scholarship is endangered. Scientific rigour is based on research problems addressed through reliable and trustworthy research results are employed to shift the frontiers of science. The Singapore Statement on Research Ethics and Integrity (2010) confirms the importance of appropriate research methods, critical analysis and evidence and comprehensive and objective feedback.
- Postgraduate supervision is often characterised by poor scientific practice. A well-known example is where the student is left without any/sufficient support to deal with the research project in matters such as delineating the research project, identifying an appropriate method to deal with the problem statement, the research design and roll-out thereof and the scientific writing-up of results. Evidence suggests that the roll-out of sound supervision practices result in the failure of the well-timed completion of research projects (see Lategan, 2009) .
- Research ethics should be seen rather as an enabler than a regulator. The perception is kept alive that ethics is a barrier to innovation and self-driven initiatives to address challenges. Anecdotal comments on the effectiveness of ethics contribute to the idea that ethics is not effective enough to steer the research system.
- Research ethics is both theoretical (knowledge basis) and applied in nature⁵ (meaning and consequences for research practice).

5 Although applied ethics is regarded as a new topic on the ethics agenda, Ten Have (2011) convincingly argues that ethics in its origin is of an applied nature. The growing

It should be stated that no research process can go without ethics. Apart from the reasons already debated, Ten Have (2011) adds a valuable perspective. He says that ethics turns one away from your subjected self to observe other. This comment emphasises that one's own perspective can never be the only perspective.

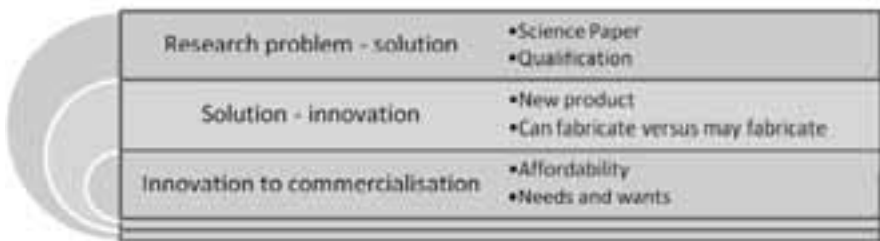
The above-mentioned ethical drivers are all supportive of including ethics in the research process. This claim can best be illustrated by various activities in the research process. I present the following examples:

- **Research design** (from the research problem to the solution): a serious challenge at this level is the authenticity of authorship, the integrity of the results and impact of the results, the cost of the research project, the expenditure of the grant, the contribution towards social cohesion, the promotion of safety and sustainability, the relevance and content and relevance of the qualification offered, what are presented to the public domain, what is placed within the public domain as science and what change is brought about as a result of this research.
- **Transfer** (from solution to innovation): an important outcome of research transfer is new product development as a result of the completed research. The knowledge economy and knowledge society require useful knowledge that can enhance business, industrial and societal challenges. One important ethical benchmark for such developments are the question whether everything that man has the ability to do, should be done? The directive is thus that not everything scientists can do is necessarily good or of value for society.
- **Profit making** (innovation to commercialisation): a well documented statement is that many technological and pharmaceutical developments are either not (really) necessary

awareness of ethical applications should rather been interpreted as the demand from society (and life) to provide ethical guidance on matters. Applied research is built own ethical theories, the analysis of other fields of study to provide answers for their ethical dilemmas and an understanding of the complexities of society itself for which these answers must be provided.

or so expensive that they become elitistic⁶. It is not acceptable to use public funding for research that has no practical value for the social communities (as end-users) either because the inventions are not practical / needed / required or are so expensive that the larger part of the community is excluded in using the results. Such an approach is not compromising on the ongoing need for basic research and the cost it will incur. The balance is not to be found in avoiding basic research or to straightjacket all research with regard to practical relevance. The approach should rather be to align one's research to what is known as "useful knowledge". This means it can either enhance the existing knowledge basis or it can lead to social and technological innovations that can contribute towards dealing with societal issues.

The next graph illustrates how ethics is linked to various stages of the research process:



Graph 1: Research activities linked to the research process

6 Verstraeten and Van Liedekerke (2010) argue from a business ethics perspective that society is not only about capital but humans using their creativity to shape society. This should be done with responsibility and care. This perspective is also applicable on commercial research activities. Research artefacts should indeed assist to empower society and to benefit social communities. They also emphasise that an ethical perspective relates to sustaining the environment, the products that are developed and whether all these newly developed products are really needed. The challenge hence is if sophisticated research products can really benefit a society. The answer can never be easy. In an HIV/Aids challenged culture it is of absolute necessity to use research, skills and remedy to find cures. The same can be said with regard to the development of cheaper but quality building techniques and material. The debate is whether in a developing society the same rigours research attention should be given to telecommunications. On the other hand is it also debateable if poverty simply means that people should be excluded from high technology simply the society is economically challenged?

4. Qualitative pointers

A qualitative research study assists with comprehending the complexity of research ethics.

Firstly, it should be noted that a recurring question in research ethics is: *What is research ethics and integrity?* The answer to this question entails much more than only a conceptual understanding. The answer to what research ethics is, is also less important compared to the question of whether researchers are applying the values associated with research ethics. In addition, matters such as cultural diversity, life orientation, religious conviction and paradigmatic orientation will also challenge what research ethics for a particular research community means. Another concern is that everyone may be in agreement that no research can go without ethics, but the absence thereof indicates that research ethics may not yet have an impact on scientific practice. This observation points to the need of a research ethos reflecting ethical values. The absence thereof is witnessed by cases of scientific misconduct such as plagiarism, neglected supervisory relationships and misuse of public funds for research (Lategan, 2011; Ten Have, 2011).

Secondly, knowledge creation is being challenged by the proverbial “salami slicing” of publications. This means that although there may be an increase in the number of publications annually, the growth in output does not mean better research or research with more impact. The suspicion is that shorter articles or the same topic are now produced. It is also questionable if the professors are still the principal investigators or whether it the students’ research finding their way back to publications? It is also a concern if the “buddy system” is blurring the boundaries when articles are subjected to peer review (see Daniel, 1993).

Thirdly, postgraduate supervision remains a challenge for reasons such as poor role understanding (who is responsible for what), poor formative assessment and communication and discipline (if there is a personal relationship between the supervisor and student how will it be dealt with?). Linked to this is poor preparation for postgraduate work that can enable the student to master his/her studies. A central

problem here is the absence of care which is core to all relations. The notion of care is to take responsibility for each other but also for the core assignment supervisors and students are engaged in. The ASSAf Report on Doctoral Studies (2010) rightfully observes that this is a relationship that should be developed and sustained since it can contribute towards the success completion of the study.

Fourthly, research and the enterprise are a growing relationship. Although valued, this relationship opens many new challenges (see Lategan and Hooper, 2009). Some concerns that should be highlighted are the potential conflict of interest when the researcher sets up a consultancy company and then does business (as university employee) with his / her (own) company! Linked to this – especially in the pharmaceutical and consultancy companies – is the concern that answers / confirmations are provided instead of new knowledge being produced. Although transfer and commercialised activities are high in demand this can never be at the expense of the development of new knowledge.

Fifthly, power play remains a challenge in higher education relationship. The problem is surely not with executing authority but with pulling rank on juniors in a team. Well-known problems are professors who insist to be a co-author with his / her student / junior colleague in a publication, team leaders, who are no longer the Principal Investigator but insists on being treated as the lead researcher or formulating policy without consulting such policy with team members.

Sixthly, researchers have the moral commitment to secure the safety of the environment and to promote sustainable development through their research projects. Safety of the researchers and their research subjects are secured through research protocols. However, not enough evidence is available that research also promotes the sustainability of the research environment. Ragnarsdóttir (2011) says that this is one of the biggest concerns in education that students are well trained to extend the environment but not to conserve it well. No ethics can have peace with this. The role of ethics is not to be an afterthought in what researchers are doing but

to constructively promote a sense of care. Care is a virtue that should be developed for and applied to the research environment as well. An ethics of care should include the sensitivity a research community has for its subjects and objects. Care should contribute towards a safe research environment in which researchers can exercise their skills and abilities in discovering the uniqueness of the creation.

Seventh, a growing concern is the matter of discipline in research. (This is not a concern in research only.) This matter is in particular evident where there is a close (family/spouse/partner) relationship between members in a research team. The concern is that the closeness of the relationship can blur the boundaries of judgement. It can be subjective or simply difficult for a husband to correct the professional behaviour of a wife in the laboratory, the father to instruct the child to redo the research assignment, for the partner to decide on a pass or fail in borderline cases.

5. Discussion

Skúlason (2011) promotes the contribution that universities can make towards the humanisation of society. For him the university is a community of teachers and students whose sole purpose is the acquisition, preservation and transmission of knowledge in the service of humanity and mankind. He commented that universities (educators) cannot claim to do too well if it is noted what is happening in the companies / world of work. He claims that an ethical approach to science can start combating this concern. For him it is the ethical endeavour to discover and to do what is *just*, *right* and *good*. He identifies *thoughtlessness* as a most serious concern. The absence of reflection and self-evaluation is alarming. The proposed solution is an ethics of knowledge. Such an ethics exists next to two other knowledge systems namely *theoretical knowledge* (truth, coherence, understanding) and *technical knowledge* (efficient, reliable, effectiveness). The typicality of ethics knowledge can be found back in solidarity, friendship and freedom. He continues his argument to identify the three missions of the (European) university

namely service to science (the “Humboldian” model), the nation (the “Napolian” model) and to the individual student (the ‘Newman” model). These missions must be understood *separately* but *integrated* in reality.

For Skúlason it is clear that teaching on ethics is required in all programmes. A major assignment for scientists (specifically philosophers) is to work on a conceptual framework to understand the world and humanity. He continues to emphasise that critical reflection should occur in science. Knowledge requires a constant investigation into the pursuit of knowledge itself. This makes knowledge a self-corrective process and questions what we learn.

He comments that three misconceptions must be avoided: ethical knowledge is subjective (influenced by personal feelings and social situation); theoretical knowledge makes one more capable of understanding moral issues and technological knowledge makes one more capable of overcoming morally unacceptable situations. For Skúlason a commitment to truth implies to be *ethical* and *theoretical* at the same time.

This advocacy makes it clear that no university or its practices can go without an ethical foundation. What should be highlighted is that higher education should have ethics as part of its programme mix / offerings, it should promote a social ethic and it should add an ethical perspective to its programme offerings. Following on this perspective, is the challenging question whether universities (through its programme offerings) can make students “more ethical sensitive”? A study by Low, Davey and Hooper (2008) draws the conclusion that exposure to ethical dimensions in programme offerings (in this case the accounting sciences) can make people more aware of the importance and the challenges of ethics. It would therefore be appropriate to have ethics embedded in the three mission statements or core activities of a university, namely teaching, research and engagement. .

With regard to applying research ethics to the broader mission statement of a university, it should be clear that (i) since research is a core university mission and (ii) ethics is a cross-cutting topic, that

research ethics should be regarded as more than simply worthwhile mentioning or mentioned in passing. The proposal of this study is that research ethics should become part of what could be regarded as research education.

What the various discussions in (research) ethics advocated, is that (i) knowledge on what research, science and ethics is, is essential to understand the demand for and promotion of a research culture informed by ethics and integrity. It also (ii) alludes to the trustworthiness of the research process and that care should be exercised in all research activities. These debates 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. (v) Professional and social (research) ethics are the business of a university.

Core to any research would be the following values:



Graph 2: Core elements of a research ethics

These values can best be described through the well-known concept of *biodiversity*. Although this concept refers to diversity in biology (Ten Have 2011), it has been popularised to describe the

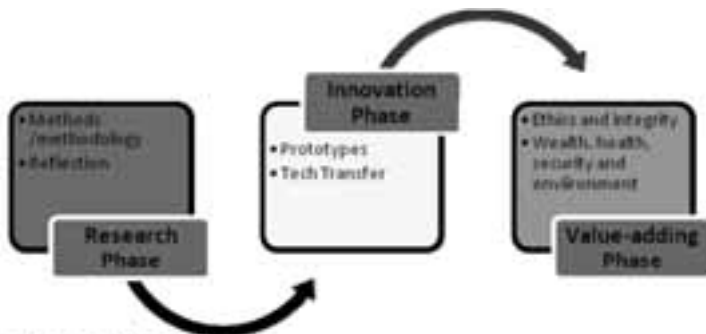
interconnectedness of activities. One can even refer to the ethical value chain when referring to these values. Following on an overview of values and virtues, it would not be unwarranted to refer to these virtues as “the biodiversity of research ethics” (see for an informed overview of values Comte-Sponville, 2008).

6. Taking research ethics to research education

Research education can be broadly defined as *what knowledge and skills are required to engage with all the stages of the research process*.

Research education is therefore broader in scope than doctoral education. It is directed at creating a pedagogy to comprehend the various stages of research, ranging from problem identification to problem solution, from problem solution to incubation, product development to innovation, from innovation to commercialization to production, from production to the end-user (which refers to various communities – business, industry, government, social communities, etc.) (see Lategan, Holzbaur & Le Roux, 2009).

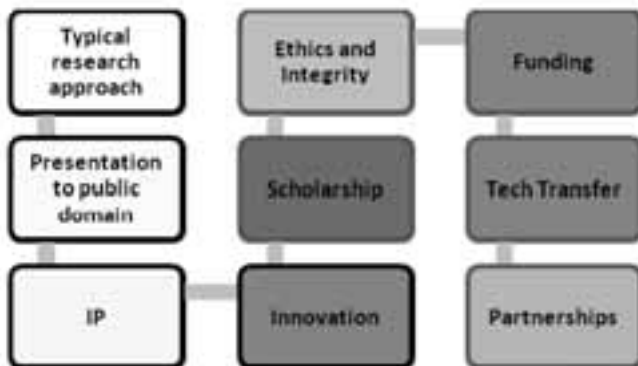
This view can be presented as follows:



Graph 3: The research cycle

In defining a place for research ethics in research education, it can be observed that research ethics and integrity is a topic that will be discussed in addition to many other topics in research education.

The following topics are representative of this broad-based view of different activities in the research process⁷.



Graph 4: The place of research ethics with the research process

Research education is an emerging concept that is especially applicable in the development of researchers and their skills. This is evident based on a growing discussion the last decade to guide the novice, mid-career and established researcher in doing research, supervising research, assessing research, publish research and participate in research activities such as scientific editing, conference presentations, editorial work, funding applications, incubation, technology transfer, commercialization, etc. In addition, although on a different conceptual level, are issues such as scholarship, quality assurance, objectivity and subjectivity in research, etc.

Smit (2000) wrote extensively on ethics in the curriculum. He mentions three reasons why the teaching of ethics is important:

7 The exact reason for arguing for a research education curriculum is that the current training of junior researchers and doctoral students is limited to what is conventionally known as doctoral education. If traditional doctoral education handbooks are studied then the reader will comprehend that these themes are not discussed anywhere in these books. These concerns were addressed by Lategan and Holzbaur (editors 2009) and Marais and Pienaar-Marais (2010).

- It is an **anthropological** matter because it influences the lives of people on a daily basis.
- It is an **academic** matter because it serves as counterpart for reductionism.
- It is a **social** matter because the academy also has the responsibility of addressing community problems.

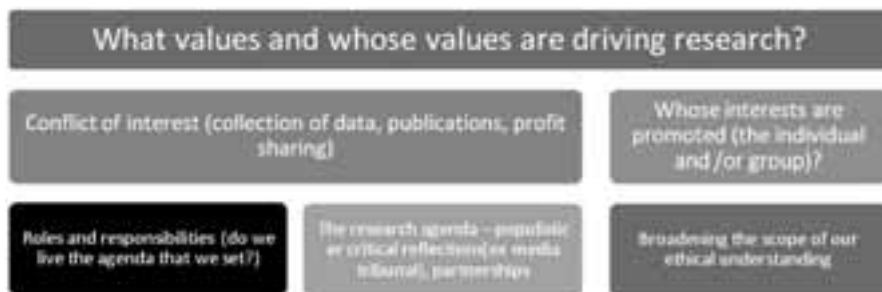
This could be presented graphically as follows:



Graph 5: Arguments in favour of ethics in the curriculum

7. Setting the agenda

Based on the background debated in this article, the following agenda for research ethics in research education can be approached:



Graph 6: The research ethics agenda

The intention of this agenda is that the researcher should be able to comprehend the following:

- An informed overview of what research ethics is, the distinction between concepts such as values, norms, integrity and virtue. The researcher should also understand what underlying philosophical traditions, paradigms, trends and developments influence the research. Since ethics can be classified as a normative field of study, the researcher should also know his / her own ethical orientation.
- The researcher should be able to identify what the ethical problem is and what ethical risks are associated with the research project.
- The researcher should practice the idea that ethics leaves no room for selfishness and that the ethics has always been the awakening of the other in mind. Ethics is always practiced in a relationship to someone / something else. The awakening of the other in research ethics relates to how will researchers contribute to the improvement of the quality of human life and how will it enhance economic growth (see National Innovation Strategy). The researcher should realise that ethics is (i) a science in own right, (ii) all sciences have an ethical side and issues that should be dealt with and (iii) ethical sensitivity secures the sustainability and trustworthiness of research results.
- Ethics in science straddle more than research on / with human subjects. An ethical awareness should be raised in all scientific disciplines. Philosophy can contribute towards conceptual knowledge of what (research) ethics is. Engineering sciences can alert one on issues of safety and the environment. Animal sciences should serve one with knowledge on how to do research on animals. Business sciences can assist to comprehend ethical issues when doing business or dealing with public funding.

8. Conclusion

This article has argued that research is an indispensable activity of any university. As one of the three core missions of a university, research is responsible to create new knowledge –

the lifeblood of any university. Unfortunately that aspect is very often neglected in research education. Where it does feature, it is often limited to the role of ethical protocols, plagiarism and obtaining consent from research participants. This article has argued that more is needed in the training of researchers.

Bibliography

- ACADEMY OF SCIENCE OF SOUTH AFRICA (ASSAf). 2010. *The Ph.D. study: an evidence-based study on how to meet demands for high-level skills in an emerging economy*. Pretoria: ASSAf.
- BADARACCO, J.L. 1998. *Business ethics: roles and responsibilities*. New York: McGraw-Hill Companies.
- BURGGRAEVE, R., DE TRAUNIER, J., POLLEFEYT, D. & HANSSSENS, J. 2008. *Witboek over corruptie en integriteit*. Leuven: Davidsfonds.
- COMTE-SPONVILLE, A. 2008. *Kleine verhandeling over de grote deugden*. Olympus.
- DANIEL, H-D. 1993. *Guardians of science*. Weinheim: VCH.
- DONALDSON, T. & DUNFEE, T. 1999. *Ties that bind*. Boston: Harvard Business School Press.
- FISHER, J.E. 2002. The practice and purpose of teaching business ethics. In: Lategan L.O.K. & Le Roux P. (Eds), *Business ethics*. Bloemfontein: Tekskor. 93-101.
- LATEGAN, L.O.K., HOLZBAUR, U. D. & LE ROUX, P.G. 2009. Orientation: The research cycle and technology-driven research: concepts fit for managing applied research? In: Lategan, L.O.K. & Holzbaaur, U. (Eds), *Managing applied research: theories, cases and perspectives. Aalener Schriften zur Betriebswirtschaft*. Band 2. Aachen: Shaker Verlag. P. 3-13.
- LATEGAN, L.O.K. 2009. Unpacking the Challenges Associated with Postgraduate Supervision - Commentary from Ethics. *Tydskrif vir Christelike wetenskap*, 45(3): 153-168.
- LATEGAN, L.O.K. 2011. Research Ethics and Integrity: What should be on the agenda? *Tydskrif vir Christelike wetenskap* 47(2): 71-89.
- LATEGAN, L.O.K. & HOOPER, P. 2009. Ethics, governance, research and enterprise. *Perspectives: Policy and practice in higher education*, 13(2): 56-60.
- MACINTYRE, A. 2011. *After virtue (revised edition)*. Notre Dame: University of Notre Dame Press.

- MARIAS, B. & MARAIS-PIENAAR, M. 2010. Research training. STEPS Conference. Central University of Technology, May.
- SINGAPORE STATEMENT ON RESEARCH INTEGRITY. 2010. Downloaded from www.singaporestatement.com. 2011, January 31.
- RAGNARSDÓTTÍR, K.V. 2011. *Welcoming address during the 24th Consortium of Higher Education Researchers' Conference*. June 23-25. University of Iceland.
- SKÚLASON, P. 2011. *The ideal of humanization and the role of universities*. Keynote speech during the 24th Consortium of Higher Education Researchers' Conference. June 23-25. University of Iceland.
- SMIT, J.H. 2000. Ethics and the technological university. In: Lategan, L.O.K. (Ed.), *The making of a university of technology*. Bloemfontein: Technikon Free State Studies in Higher Education. 144-152.
- TEN HAVE, H. 2011. *Bioëthiek zonder grenzen. Mondialisering van gezondheid, ethiek en wetenschap*. Nijmegen: Valkhof Pers.
- VERSTRAETEN, J. & VAN LIEDEKERKE, L. 2010. *Business en ethiek*. Leuven: Uitgeverij Lannoo Campus.
- WILSON, D.B. 2000. The historiography of science and religion. In: Ferngren, G.B., *The history of science and religion in the Western tradition. An encyclopedia*. New York: Garland Publishing. 3-11.