The Structure of a Science Article and its Application to Medical Ethics

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Without publication, science is dead – Gerard Piel

In hierdie artikel word 'n raamwerk vir die skryf van 'n wetenskaplike artikel voorgestel. Die voorgestelde raamwerk behels agt stappe. Verder word vier gehalteverskeringsmeganismes voorgestel om waarde tot die skryf van 'n artikel toe te voeg. Hoewel die verskillende stappe liniêr verduidelik word, is die liniêre uitrol van hierdie stappe nie nodig vir die skryf van 'n artikel nie. 'n Verdere voorstel is dat die gehalteversekeringsmeganismes nie as aanhangsel tot die skryfproses gesien moet word nie, maar as geïntegreerd met die skryfproses. Die raamwerk word op die mediese etiek toegepas.

1. General observation

Albertyn, Kapp and Frick (2007) note the close-knit association between academic writing and scholarship. A value-adding aspect of published science papers is the reputation scholarly work brings to a university and the subsidy following on published science papers. Kumar (2005:266) supports these sentiments when he states that nobody will ever know how much effort and quality have gone into a research project if it is not well written into a science paper. Scientific writing is crucial in the research

process. It is therefore no surprise that science papers are fundamental to the research value chain.

Concern exists regarding several issues pertaining to science papers, such as the quality of the papers, the creation of new knowledge through science papers, the relevance of the science papers, the impact of the science paper in a national and international context and the lack of competitiveness in the South African science paper industry. To put these concerns in perspective it is worth noting that the Academy of Science of South Africa (ASSAf) has expressed its concern about the quality of published science articles. This concern is not limited to the *contents* of some papers only. It includes matters such as the process of peer review, the impact of science papers and the overall contribution of a paper to the broader context of the creation of new knowledge (see the Report on a Strategic Approach to Research Publishing in South Africa, 2006).

This concern is reflected in the work of Albertyn and Kapp (2007). These authors conducted a study on editors' perspectives on reasons why papers are rejected for publication. Their research confirms the important role of academic writing as a vehicle for new knowledge development. Writing science papers is not without error or challenge. In the literature review in support of their research they point out many reasons why science papers are not suited for publication. Two particular references are relevant to the focus of this paper. They refer to Diezmann (2005) who classifies errors in science papers as being of a *mechanical nature* (spelling) or *scholarly nature* (unsubstantiated claims) and on a *microstructure level* (flow of arguments and inconsistencies) or *macrostructure level* (quality and clarity of purpose) (Albertyn & Kapp, 2007:64). The authors also refer to Morss and Murray (2001:63,64), who find that a framework for writing is needed to put writing in real time and space.

Several years of editorial experience confirm these concerns. A fundamental observation is that the absence of a scientific structure on how to write for publication is very often the reason why an article (a) is declined for publication, (b) is a mere repetition (and not even a repacking) of existing knowledge, and (c) doesn't contribute to the scientific domain of a field of study. Support for this observation is found in the editorial note of *The Academy of Management Review*, 32(3), 2007, July. The editor, Martin Kilduff, listed the top ten reasons why a paper might not be sent out for review. Some of these reasons relate to the structure of the scientific paper. Of relevance for the discussion in this paper is the review of the literature which is a mere summary of what is already stated in literature. There is no contribution to the theory beyond what has already been written by others, and there is no new contribution to theory or the development thereof but only a collection of thoughts.

2. Problem statement, aim and objectives

A general problem in science papers is the apparent lack of quality due to reasons ranging from poorly conducted research, research methodologies not in support of the research, insufficient reporting on the completed research, to no new contribution to research. These problems are often caused by a lack of a systematic framework for science writing, amongst other things. This paper wishes to address this Achilles' heel in the research process.

The aim of this article is to present a structured framework for publication writing. The aim follows on the problem statements of this article, namely that the absence of a structured framework for scientific article contributes to poor science and the (very often) non-publication of such a article. The objective of this article is to illustrate how various concepts within research practice can constitute such a framework.

This article is an extension of a previous study in which a framework was proposed to deal with writing for publication. A twelve-step approach followed as a result of the research (see Lategan, 2006). In this article the framework is refined and crafted into a systematic process framework to deal with both a structured approach to scientific writing and the quality assessment of the article. The latter is worked out in another study (Lategan, 2007).

The application of this framework will be illustrated through examples from the field of medical ethics.

3. Hypothesis

This article is based on the hypothesis that a structured framework can assist researchers to write quality science articles.

4. Case studies in support of problem statement and hypothesis

Three different cases support the stated problem and hypothesis.

Firstly, Lues and Lategan (2006:38) identify the structure (and not headings) of a science article. This is based on research into the structure which is followed by many disciplines and journals. According to them the normal layout of a science article consists of the following:

- Title
- Abstract
- Introduction
- Identification of methodology(ies)
- Body or content (literature review, qualitative/quantitative study, results and discussion)

- Conclusion
- References
- Appendices
- Key concepts (growing need)

Lester and Lester (2002:100) state that a science article should have the following elements:

- Identification of the problem or issue.
- A review of the literature on the topic.
- A stated thesis or hypothesis.
- Analysis of the issues at stake.
- Presentation of evidence to support research.
- Interpretation and discussions of the findings.

The dynamics of the science article are created by:

- building anticipation in the introduction;
- investigating the issues in the body; and
- providing a final judgment.

By following these guidelines, the author will satisfy the demands of the academic reader who expects the author to deal with the:

- examination of a problem;
- citing of literature regarding the problem; and
- offering of ideas and possible interpretations of the literature (Lester & Lester, 2002:101).

A conclusion from these reflections is that a science article *should be structured and that it should have a systematic and focused approach.* The reasoning behind this conclusion is based on the logical flow a science article should have in order to address the problem statement, to illustrate how the methodology is employed in the article and how qualitative and quantitative information has contributed to the new knowledge presented in this article. This systematic and structured approach should follow on the structured approach followed in the research process. Verschuren and Doorewaard (2005) discuss the design of the research proposal within a *conceptual* and *technical* understanding of the research. The research is based on the logical design of a research project. The logical approach denotes a structured approach. Science is not random but follows a logical sequence of events. The same principle is applied to science writing, which follows a general construction or design (see Padmos, 2006). Albertyn and Kapp's (2007:70) research confirms that the research aspect most commonly noted as error in science articles is the research design. The latter itself is a structured approach to research. Strydom (2005:254) gives good advice when he states that "A clear bridge should be built between the various sections of a research (or science article – LOKL) report, but the various parts should form a unit."

Secondly, Mouton (1996:173) argues that science articles are about the conclusions made based on the research conducted. This observation is based on what the essential differences are between formal studies and a science article. The following table illustrates Mouton's view. The essential difference between these two approaches to research is that the science article is less about reflecting on what other researchers have said and more about the researcher's own opinion based on research. The conclusion from this is that a science article is not about repeating existing knowledge but is rather about how existing knowledge can be used as a basis to create new knowledge. Following on this conclusion is the logical deduction that a science article is not a rehearsal of facts but the creation of new information.

	M Degree	D Degree	**Article**
Problem	30%	20-30%	**10-15%**
Evidence	30%	20%	**10-15%**
Conclusions	40%	50-60%	**70-80%**

Thirdly, a case study based on editorial feedback highlights that articles are rejected primarily for the following reasons:

- The absence of a structured approach to the research. The integration of perspectives, arguments and data in support of the research are very often lacking.
- A repetition of existing facts and no new knowledge added to the debate.
- A poorly written science article with very little or no critical review of an argument. The conclusions in the article are not consistent with the intention of the science article.
- The lack of a proper literature review.
- No research problem to lead the discussion of the article.
- Inappropriate methodology and/ or data to address the research problem (cf. Lategan, 2006:137).

These three cases support the central argument of this article that a structured framework can guide the researcher to meet the criteria for a science article. (Criteria here refer to those fundamental perspectives that inform a science article and not the format expected by science journals.) Albertyn and Kapp's (2007:68) empirical evidence following on their research substantiates this remark. They note a high number of articles sometimes (or often) missing out on issues such as the lack of a focus, poor contextualization of the article, and so forth.

5. A proposed framework for the structure of an academic article

5.1 Background to the framework

Following on the requirements of a science article a *systematic process framework* has been designed to accommodate the requirements of a science article. This framework focuses intentionally on the *understanding* and *integration* of science writing into the research process. The research process should follow a *holistic approach* to solve the science problem by means of suitable and appropriate activities. As this is a holistic approach, no activity associated with the research process is excluded. Although researchers view the research process in different ways, Mouton (2001:114) has captured the logic of the research process in four activities, namely the *research problem, design, evidence* and *conclusions*. A more expanded approach is found in Kumar's (2005:15-25) eight-step model. He suggests that the research process be divided into *steps in planning a research study* and *steps in conducting the study*:

Steps in planning a research study:

- Formulating a research problem
- Conceptualising a research design
- Constructing an instrument for data collection
- Selecting a sample
- Writing a research proposal

Steps in conducting a study:

- Collecting data
- Processing data
- Writing a research report

Based on another study (Lategan, 2006), the author proposed a research process capturing both the mechanical (what and how to do) and normative values (why you are doing) of publication writing. The research process consists of twelve essential activities which capture four different phases of the research process, namely *the planning of the research, the activation of the research, the execution of the research* and *the evaluation of the research.* The table below reflects these activities:

Table 1: The research process

Steps	Research process activities
1	Research problem
2	Conceptualising
3	Ethical approval
4	Hypothesis

5	Research methodology
6	Scientific framework and philosophy
7	Literature study
8	Data
9	Results
10	Hypothetical evaluation
11	Conclusion
12	Literature references

The same process can be linked to the structure of a science article (see Lategan, 2006). Linked to the systematic process framework, one can say that the science article reviews and evaluates the research process which consists of the research problem, design, evidence and conclusions. The holistic nature of the proposed framework can be compared to a puzzle where all the bits and pieces of the puzzle should fit before the review is complete.

The science article should not be seen as an *add-on* to the research process but as *integrated into* the research process. Writing itself is thus a process (Murray, 2007). It is for this reason that one should refrain from the phrase "*the writing up of the research results.*" Kamler and Thomson (2006:3) rightly point out that they are opposed to the notion of writing up, as this creates the impression that one must first do the research, and only after that, write it up. "Writing, however, is a virtual part of the research process. The activity of research is one that, from the very outset, involves writing." It is not about being picky about words. They don't see writing as a skill but as a social action. A skill suggests that language is without complexities and can be mastered as such.

The research results have to be placed in the public domain through a research report, conference proceedings, science article, and so on. Writing the research results should follow the progress and outcomes of the research captured during the various stages of the research project.

The systematic process model was workshopped during 2006 with two groups of novice researchers with very little or no experience in science writing for publication and with no publications to their credit. Results of these workshops were presented during a postgraduate supervision conference at the University of Stellenbosch, 2007. This article is partly based on the results presented during the mentioned conference.

5.2 The framework

The research followed in this project identified eight essential steps that constitute the framework for a scientific article. As stated in section 5.1, science writing is intertwined with the research process. The table below portrays this framework.

Table 2: The structured process framework

Steps	Focus	Intention
1	Identify the research problem/question. Why do I need to do this research? What are the aims and the objectives of the research?	No research can be without a research problem. The research problem should not be regarded as a negative approach to research. It refers to what the problem in the research project is, and how solutions for this problem are sought. The aims and the objectives indicate what the science article wants to achieve via the stated research problem. Kumar (2005:41) rightly remarks that the way in which a research problem is formulated will determine almost every step of the research process. It is for this reason that he compares the research problem to the foundation of a building. He states: "The research problem serves as the foundation of a research study: if it is well formulated, you can expect a good study to follow."
2	Conceptualisation	All sciences work with concepts. An explanation of a concept creates a common understanding of the concept. This is a necessity, especially in the human sciences, because of the influence of the philosophy of science, various paradigms, scientific traditions and schools of thought. Du Toit (2005a:25) defines conceptual analysis as an investigation into "the boundaries between terms and try to reveal them clearly for ourselves." Macnee (2004:216) adds to this understanding: "A conceptual framework also is an underlying structure, but it comprises concepts and the relationship amongst concepts." The clarification of concepts (conceptualisation) should

		be distinguished from the activity of conceptualising the research process. The latter has to do with the roll-out or planning of the research project (see Kumar, 2005:20-22).
3	What is the hypothesis following on my research problem? (Less evident in qualitative research.)	In the hypothesis the expected outcome of the research is identified. Macnee (2004:94-95) defines the research hypothesis as the prediction of the relationship of differences that will be found for selected variables in the study. The value of the hypothesis is the specificity, direction and focus it brings to a research study (Kumar, 2005:73). Van der Merwe (2005:114) rightly reminds researchers that a hypothesis is not a preconceived assumption.
4	Research methodology	The research methodology consists of the "tools" used to execute the research project. Many research articles fall short, either in using an appropriate research methodology for doing the research or in explaining why a particular methodology is used. For example the Delphi methodology is known to achieve consensus among a large group of people. This methodology can employ several rounds to verify the consensus. An article can fail if it doesn't explain why a chosen number of rounds is employed in the data collection. Macnee (2004) takes an interesting approach to applying research methodology. She discovered through the teaching of research courses that students are taught as if they are going to *implement* research instead of *using* it in their practice. This leads to a mind shift: what knowledge is needed to use research in practice?

5	Scientific framework and philosophy. What is your research paradigm / frame-work? The role of ethos.	A science article interacts from a particular scientific background with science. In the human and social sciences, the role of paradigms is especially evident (Mouton, 1996:10-12, 203-208).
6	Start with a literature review	The literature reflects on (and not lists) the latest published research results on a particular topic. The researcher interacts with the literature to identify new trends, results and methodologies. Burns and Grove (2007:161) expand on this by saying that the literature review is a summary of current knowledge about a problem and includes what is known and not known about this problem. Du Toit (2005b:59) rightly reminds us that the integrity of the text should be protected. To avoid misinterpretations the reading should be shaped around the text itself.
7	Field work (data collection)	A research project very often requires the verification of the results via either qualitative and or quantitative research techniques. Through data collection new knowledge can be added to a particular topic (Mouton, 2001:98-110).
8	Discuss and analyse the research results	A science article is about using one's research results based on the interaction with literature, and the integration of the literature review results with the qualitative and/or quantitative data capturing. The results should be analysed (evidence taken apart) and discussed (including the execution of various forms of critique) to build a new understanding of the identified research problem and to identify new problems that need to be addressed. Botes (2005:176) remarks that valid scientific

		knowledge is distinguished from pre-scientific knowledge by "systematic problem-solving methods; it is well enough supported by empirical and theoretical statements; it is accepted by a particular research community; and is an accurate reflection of reality."

The successfully completed science article should be subjected to quality assessment. Four assessment activities are essential: firstly the assessment of ethical practices associated with the research, secondly technical issues associated with scientific writing, thirdly whether the research problem has been solved and fourthly whether any new results were presented. The following table will elaborate on these assessment qualities.

Table 3: Quality assessment of the scientific article

Focus	Intention
Ethical issues and considerations	Ethics in research will reflect on scientific misconduct. Scientific misconduct includes issues such as falsification and/or fabrication of information and/or data, plagiarism, self-plagiarism, the absence of informed consent, conflict of interest, poor supervision, the lack of responsibility in laboratories working with hazardous material, the ignorance of personhood, the environment, animal rights, etc. Lester and Lester (2002:123) state that integrity is connected to credibility. They refer to ethics of research especially in following matters: • Using sources to establish your credibility • Using sources to place your work in proper context • Honouring property rights • Avoiding plagiarism • Sharing credit and honouring it in collaborative projects • Honouring and crediting electronic sources • Seeking permission to publish material on your website

A science article should reflect the mastering of analytical skills, methodological skills and technical writing skills	Analytical skills • You argue a point (do an analysis of arguments). • For each argument there is at least one reason. • A reason is supported by a literature reference/case study/experiment. • You never make statements without being able to prove the statement. • Each argument can be validated. • Your argument must not only be able to support your view but also to counteract views that might differ from yours. • Your literature reference/case study/experiment must be the latest authority on the topic. • Methodological skills The researcher needs to ask three assessment questions (see Lues & Lategan, 2006:18): • Is the methodology reliable? • Is the methodology valid? • Is the methodology feasible? Technical writing skills • Avoid what has already been said • Be critical • Add a new meaning • Be to the point • Lead the discussion • Have an own opinion
Have you solved your research problem?	The science article will never be completed unless the research problem is addressed. If the research problem is not addressed there cannot be evidence of the creation of new knowledge.
Anything *new* in your esults? (New knowledge development)	This is a self-assessment exercise to evaluate whether the research is a mere repetition of what is already stated in the literature or similar studies or whether a new understanding of the process is added.

5.3 Discussion of framework

In presenting this systematic process model for writing a science article four things are evident:

- *The science article mirrors the research process.* Where the research process is a managerial approach to accomplish a research assignment, the science article is the reflection of this process. The science article and research process will not differ in approach. The research process essentially deals with a variety of research techniques, methods and instruments to solve a research problem. The science article reports on the approach taken and methods used to address the research problem. The claim can therefore be made that the approach to the research article and the research process run parallel to each other.
- *Not all the activities associated with the science article are on the same conceptual level.* The eight steps identified for the writing of a science article are on a methodological level whilst the four assessment steps identified deal with quality assurance issues of a article. Within the eight steps associated with the writing of a science article, steps such as the problem statement, the literature review and the discussion of research results are essential, while the hypothesis and fieldwork might be optional. This doesn't mean that optional methodologies are less important. It simply implies that the design of research methodologies to address the research problem is influenced by the field of study and the nature of the research problem.
- *The steps identified for writing a science article are a generic set of actions* and (the major part thereof) can be found in the science article. If the sequence of problem, design, evidence and conclusions is followed then it is safe to say that this framework will be the foundation of all science articles – regardless the discipline. But the *design* followed in the ethics article might differ from the one in biology, because fieldwork and data capturing may be less evident. A hypothesis might also not be formulated in the science article. A science article can be without a hypothesis.
- *The identified steps do not have to follow a linear roll-out but are dynamic, interactive and repetitious.* A good introduction to the literature on a particular topic is required to formulate a research problem. Once the problem is formulated a more extensive review of literature is required. It is also possible that ethical requirements could adjust the research problem. The quality assessment of the literature review can take place after the literature has been consulted or whilst the researcher is busy with the review.
- Although a close-knit coherence between the science article and the research process exists, *these two activities hold unique roles in research.* The research process consists of the methods implemented to address the research problem and to create new knowledge. Through the science article, the research is placed in the public

domain. The research process is much more elaborate whilst the science article is concise and focused.

6. Application to medical ethics

The above-mentioned framework can be applied to research ethics in the health sciences in the following manner:

Medical ethical codes direct ethical behaviour in the practice of medicine and health care. Values such as respect for human life, the dignity of the patient, informed consent, the right to privacy, and so forth, will inform ethical codes (scientific framework). Following on the intention of these codes is the notion that these codes should also direct the research associated with the health sciences. In this regard reference can be made to the well-known *Hippocratic Oath* ("With purity and with holiness I will pass my life and practice my Art"); or the contemporary *"New" Hippocratic Oath* (That you will exercise your art solely for the cure of patients …). In addition, the Nuremberg Code's (1946-1949) ten principles are also called as witness to support the above-mentioned view. Principles five and ten are of particular relevance:

(5) "No experiment should be conducted where there is an *a priori* reason to believe that death or disabling injury will occur …"

(10) "During the course of the experiment the scientist in charge must be prepared to terminate the experiment at any stage, if he has probable cause to believe, in the exercise of good faith, superior skill and careful judgment required of him that a continuation of the experiment is likely to result in injury, disability, or death to the experimental subject."

The Helsinki Code makes a distinction between therapeutic and non-therapeutic (conceptualisation) research. This distinction further outlines the role and limitations of research in health care (literature review). In spite of these well articulated medical ethical codes there are still four major challenges facing medical researchers. Firstly, how should researchers react to the post-modern zeitgeist in science? Secondly, what guidelines are available to deal with new technological developments in health sciences? Thirdly, what influence has the consumer society and replacement culture on research in health sciences? Fourthly, is health sciences research done to stimulate the health economy? These and other questions demand an update of medical oaths to address the issues (problem statement). A brave new world associated with the health sciences necessitates, among other things, ethical practice. Ethical practice in general involves more than just ethical codes and compliance to applicable legislation (hypothesis). The challenge to formulate contemporary and relevant ethical guidelines should comprise several conceptual domains (research methodology). *Firstly*, ethics is the application of principles and their values to a situation. This must not be confused with complying to legislation or subscribing to an ethical code.

Secondly, ethical guidelines should address contextual developments. Here one can refer to the influence of technology and economy on health developments. An ethic not inclusive of these ideological influences will not be able to address the challenges posed to the health sciences. *Thirdly*, ethics can never be removed from belief structures and convictions. In a multi-cultural and multi-religious environment, commonalities instead of differences should be highlighted (literature review). This challenge is further complicated by new developments within the health sciences which are informed by research. The devotion to research ethical guidelines in the health sciences is as important as ethical behaviour in the health sciences. Here questions such as: *Is the research necessary?, Is the planned research scientifically sound?, What is the cost associated with the research?, What is the potential risk associated with the research?, What is the potential value associated with research?, Are there control groups for the different experiments in the research? and so on,* are important to direct ethical behaviour in conducting research in the health sciences (analysis and discussion).

7. Evaluation

From the framework and the practical application it is evident that the framework can direct the researcher to write a focused science article. It is also clear that in *doing research* (as opposed to applying research) this framework can provide overarching assistance in the writing of the science article. In drafting the article the proposed steps are not sequential, but in conceptualising the article a linear approach will be apparent. It is also obvious that not all steps may be required to write the science article. In the above-mentioned case the employment of fieldwork and data capturing is, for obvious reasons, absent.

The quality assessment of the article is not an activity following on the completion of the article but one that should be taking place during the writing process itself. For example, ethical responsibility is executed through acknowledging authors and avoiding information that may mislead the reader. Whilst writing the research the author is also mindful of creating new knowledge. The challenges calling for a revised ethical code are examples of this orientation.

8. Conclusion

The intention of this article is to guide the reader in how to write a science article. This article suggests a route that can be followed to write in such a way that the basic requirements of science articles are accommodated. The proposed framework should be read against the need to enhance the quality of science articles, to contribute to the creation of new knowledge when writing a science article, and to be focused in one's arguments when writing a science article.

Bibliography

ALBERTYN, R.M. & KAPP, C.A. 2007. Accepted or rejected … Editor's perspectives on common errors. Paper read at the State-of-the-art and the artist conference. Stellenbosch. 23-26 April.

ALBERTYN, R.M., KAPP, C.A. & FRICK, B.L. 2007. An action learning approach to the writing of journal articles. Paper read at the State-of-the-art and the artist conference. Stellenbosch. 23-26 April.

BOTES, A. 2005. Validity, reliability and trustworthiness: to sum up. In: Rossouw, D. (Ed.), *Intellectual tools: Skills for the human sciences.* Pretoria: Van Schaik Publishers. 176-184.

BURNS, N. & GROVE, S.K. 2007. *Understanding nursing research: Building an evidence-based practice.* St Louis: Saunders Elsevier.

DIEZMANN, C.M. 2005. Supervision and scholarly writing: writing to learn – learning to write. *Reflective Practice,* 6(4): 443-457.

DU TOIT, L. 2005a. Conceptual analysis. In: Rossouw, D. (Ed.), *Intellectual tools: Skills for the human sciences.* Pretoria: Van Schaik Publishers. 22-36.

DU TOIT, L. 2005b. Reading strategies. In: Rossouw, D. (Ed.), *Intellectual tools: Skills for the human sciences.* Pretoria: Van Schaik Publishers. 58-69.

HELSINKI CODE. (Online). Available from <http://ethics.iit.edu/codes/coe/world.med.assoc.helsinki.1975.html >. Retrieved 2007-08-20.

HIPPOCRATIC OATH. (Online). Available from: <http://www.pregnantpause.org/people/hippo.htm>. Retrieved 2007-08-20.

KAMLER, B. & THOMSON, P. 2006. *Helping doctoral students write: Pedagogies for supervision.* London: Routledge.

KUMAR, R. 2005. *Research methodology*: *A step-by-step guide for beginners*. London: SAGE Publications.

KILDUFF, M. 2007. Editor's comments: The top ten reasons why your paper might not be sent out for review. *The Academy of Management Review,* 32(3): 700-703.

LESTER, D. & LESTER, J. 2002. *Writing research papers: A complete guide.* Longman: Boston.

LATEGAN, L.O.K. 2006. 'n Voorgestelde raamwerk vir die skryf van 'n akademiese publikasie: Voorbeelde uit die teologiese etiek. *Acta Theologica,* 26(2): 136-154.

LATEGAN, L.O.K. 2007. More than just an own opinion: A proposed framework for self-reviewing scientific articles. Lessons for (theological) ethics. Unpublished manuscript. Bloemfontein: Central University of Technology.

LUES, L. & LATEGAN, L.O.K. 2006. *Re:Search ABC.* Stellenbosch: Sun Press.

MACNEE, C. L. 2004. Understanding nursing research: Reading and using research in practice. Philadelphia: Lippincott Williams and Wilkins.

MORSS, K. & MURRAY, R. 2001. Researching academic writing within a structured programme: insights and outcomes. *Studies in Higher Education,* 26(1): 35-52.

MOUTON, J. 1996. *Understanding social research.* Pretoria: Van Schaik Publishers.

MOUTON, J. 2001. *How to succeed in your Master's and Doctoral Studies.* Pretoria: Van Schaik Publishers.

MURRAY, R. 2007. Incremental writing: A model for thesis writers and supervisors. Paper read at the State-of-the-art and the artist conference. Stellenbosch. 23-26 April.

NEW HIPPOCRATIC OATH. (Online). Available from: <http://en.wikipedia.org/wiki/Hippocratic_Oath> Retrieved 2007-08-20.

NUREMBERG CODE. (Online). Available from: <http://ohsr.od.nih.gov/guidelines/nuremberg.html>. Retrieved 2008-08-20.

PADMOS, B. 2006. *De scriptie supporter: Een doeltreffende aanpak van je scriptie.* Antwerpen-Appeldoorn: Garant.

REPORT ON A STRATEGIC APPROACH TO RESEARCH PUBLISHING IN SOUTH AFRICA. 2006. Pretoria: Academy of Science of South Africa.

STRYDOM, H. 2005. Writing the research report. In: De Vos, A.S., Strydom, H., Fouché, C.B. & Delport, C.S.L. (Eds.), *Research at grass roots for the social sciences and the human service professions.* Pretoria: Van Schaik Publishers. 246-258.

VAN DER MERWE, C.A. 2005. Statistical aspects in empirical research. In: Lategan, L.O.K. & Lues, L. (Eds.), *Doing Research.* Bloemfontein: Tekskor. 112-130.

VERSCHUREN, P. & DOOREWAARD, H. 2005. *Het ontwerp van een onderzoek.* Utrecht: Uitgeverij Lemma.