



THE AFRICAN ACADEMY OF SCIENCES

**PROCEEDINGS**

AAS/IAMP WORKSHOP

on

**SCIENTIFIC WRITING  
FOR YOUNG SCIENTISTS AND CLINICIANS**

**OCTOBER 23-26 2006, HILTON HOTEL, NAIROBI, KENYA**

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# Proceedings of the AAS/IAMP workshop on scientific writing for young scientists and clinicians, at the Hilton Hotel, Nairobi, Kenya, 23-26 October 2006

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## I. Introduction

This inaugural workshop, the first in a series of annual workshops to follow, was organized by the African Academy of Sciences (AAS) and the Inter-Academy Medical Panel (IAMP). It was held for young scientists and clinicians from the East African Region at the Hilton Hotel, Nairobi, Kenya on 23-26 October 2006. Participants were from Ethiopia, Kenya, Sudan, Tanzania and Uganda. The workshop was chaired by Professors Stephen G. Agong and Gideon G. B. Okelo. The facilitators were Professor Elisabeth Heseltine from France, Dr Erastus Njeru from Kenya and Professor Bill Lore from Kenya. Mrs Serah W. Mwanyiky was the workshop rapporteur. The list of participants is in Appendix I.

In his opening remarks, Prof. Gideon B. A. Okelo, IAMP Project Coordinator, emphasized the importance of communication in English in the advancement of scientific research. He said that scientific communication is an integral part of research. Presenting of scientific ideas and results accurately is key to professional success for young scientists. Good scientific writing enhances scientific publications and fundraising efforts. Research proposals generated by young scientists from Africa do not merit funding, because of their poor quality. As a result, financial resources are not equitably shared. Yet successful fundraising will generate research and publications, with the spiral effect of making lives of African scientists more vibrant. This workshop was intended to improve the communication skills of young scientists and health professionals.

Professor Stephen G. Agong, AAS Executive Director in his welcome remarks, gave an overview of the academy. It brings together scientists in different disciplines for the advancement of science and currently has 134 fellows from different countries. He invited the young scientists to become members of the AAS. Further information can be obtained from the AAS website, [www.aasciences.org](http://www.aasciences.org).

He observed that the university curriculum leaves the graduates unequipped in communication. Nevertheless scientific papers and books require high levels of precision and accuracy. Hence, scientists must inevitably become experts in science writing to be effective. The academy has developed its publications programme to foster scientific communication and the dissemination of scientific publications in Africa. It publishes the journal, *Discovery and Innovation, which is in the process of being digitized*. This expertise puts the Academy in the unique position to champion capacity building in scientific communication in Africa. The workshop is intended to develop leaders in scientific writing by sharing experiences. It brings together young scientists from different countries to use their diversity as a source of motivation for socio-economic advancement. The objectives of the workshop were to discuss the key elements in scientific writing: study design; data collecting, recording, analysis and interpretation; science communication; and journal editing.

## II. The Presentations

The following is a summary of the highlights of the presentations by the facilitators; Prof. Heseltine, Prof. Lore and Dr. Njeru respectively.

### SCIENTIFIC COMMUNICATION By Professor Elisabeth Heseltine

She emphasized that one of the objectives of the workshop, is to improve the visibility of scientific research in Africa. The following was the outline of the presentation:

- a. General introduction:
  - deciding when to write
  - choice of journal
- b. Title, authors, abstract and keywords
- c. Writing of the:
  - introduction
  - materials and methods
  - results; designing tables and figures
  - discussion
- d. Acknowledgements and references
- e. Publication process:
  - submitting of the manuscript
  - dealing with reviewers
  - correcting proofs

The emphasis was on the organizing of ideas other than the English in the writing of scientific papers. Good scientific writing organizes ideas for the reader and journal to immediately identify the importance of the information. The participating young scientists were also taught proposal writing. Hands-on sessions addressed papers and proposals developed by the participants. It gave the scientists an opportunity to objectively critic their own work.

### Classical scientific manuscript

Types of articles

Different types of articles include: clinical event or case, letter to the editor, review articles, monographs, thesis, editorial, article for lay public, poster and original research article.

When to write

Writing is an integral part of scientific research. It should progress concurrently with the research and not at the end. Hence, scientists should keep writing during the research, because whatever is not written does not exist.

They should engage in original research by being aware of what has already and is being done. This can be achieved through literature search. It was emphasized that the researcher should obtain the full paper and not make inferences. Sources of literature include: internet, abstracting and indexing journals, international and national data bases, other researchers, library facilities and authors of relevant identified materials. Some journals, e.g. *The East African Medical Journal (EAMJ)* do not accept internet references. The participants appealed to the Editor-in Chief of EAMJ, Professor Bill Lore to consider the changing of this policy in view of the advancing electronic era. His argument was that some of these references are not credible. Hence, the references should be current and credible. It was also recommended that while the study is in progress, the scientist should continue to check on the on-going and completed research.

Before researching and writing the scientist will choose the journal in which to publish and then find out the requirements for submission. The selected journal has to be one which is credible, peer reviewed and accessible to the intended readers or audiences.

## Writing of the paper

The paper should answer 4 basic questions:

- a. What is the question?
- b. What did you do?
- c. What answer did you get?
- d. What does it mean?

The logical sequence is more important than the English and prose. Science writing should be clear and simple, without the flavour and spicing of popular writings. Hence, the organizing of the ideas for the reader and the journal, to immediately recognize the importance of the contribution is very crucial.

A clear statement of the question should be made at the beginning. This will feature in the title and subsequently in the rest of paper, which is written logically to answer the question. This is done systematically in a sequence as follows: **title, authors, addresses, abstract, introduction, materials and methods, results, discussion, acknowledgements and references.**

The author will get the requirements or the instructions to authors of the selected journal and follow these strictly. Through the checklist provided by many journals and submitted with the paper, the authors will ensure that they have complied. Appendixes II A and B provide the uniform requirements for manuscripts submitted to the biomedical journals and checklists, respectively.

The title of the paper clearly states the question. It should be concise and clear to give the content of the paper. Use of slush (instead of or/and), study design or abbreviation is discouraged in the title. The name of the author should be used in consistence with the standard abstracting and

indexing styles. Subsequent sequence of the paper will be based on the requirements of the journal selected by the author. The general trend is however, fairly standardized. The details will be found in Appendix III. The materials and methods are provided in detail separately to enable the reader to repeat the experiments. The results and discussion sections are separate and well-defined. Points of limitations are included in the discussion to validate the conclusions. Illustrative material should be clear and relevant and specific in quality and quantity. Professional graphic artists and photographers could be solicited for these. Examples of the different types illustrations and their appropriate uses are provided in Appendix IV. References should be complete and original for the readers to identify and access them.

## Proposal writing

Before writing of a proposal, some preliminary work should have been done—a feasibility study. The outcomes to be achieved should be quantitative or measurable. The proposal should be based on the question to be answered. It should include the following details:

- Proof of the qualifications and not just the curriculum vitae of those to be involved in the study, such as the principle investigator, scientist and laboratory technicians.
- References to important methods to be used.
- Detailed descriptions of the experimental design and statistical analyses methods to be used
- Results of feasibility or pilot study.
- The actual budget and not an underestimate or overestimate.

Further details on proposal writing will be found in Appendix V. Examples of the call for proposal and application form are in Appendixes VI A and B. The content of the proposal depends on the donor. Hence, the researcher should find out the requirements and strictly observe them. The grant application forms are all specific and different and the applicant will need to spend much time on paper work. Grant proposals should be very transparent and honest in all aspects.

Proposals are rejected when:

- the applicant lacks technical credentials.
- the problem identified is not significant, compared to more pressing concerns.
- project coordination is wanting in that the logistics, time frame, budget and statistical methods are inappropriate.

It would be advisable for a potential applicants to refer to the successful applications for National Institute for Health (NIH) website to overcome some of these flaws.

The question of allowances for researchers was also addressed. There was a consensus that researchers may request for top-up pay or honorarium for their efforts. Those in authority should be convinced to allow this as a policy.

At the practical hands-on sessions on scientific writing and proposal writing, the participants provided their papers and proposals for constructive critique. The comments and suggestions provided useful insights on the actual writing of these materials to the participants:

- The title could be not only ambiguous but also misleading.

- Some of the writing deviated from the question.
- Samples are comparative when they are equal and of well defined parameters, such as age, source and size.
- The objective of the study should be clear.
- In the discussion, limitations and conflicts of interest should be mentioned convincingly.
- The contents of different sections of the paper were found to be misplaced.
- The present and passive tenses were used rather inaccurately. Passive could be used for materials and methods and present tense for own observations, such as in the introduction and discussion.
- When further investigations are recommended as a conclusion, the author should be very specific.
- Visual evidence can be very misleading. It can only be used if it adds to the information in the text. Similarly, illustrative materials can be used to add to the information in the text.
- The data could be rounded-off when appropriate to avoid insignificant decimal points.
- Use of appropriate illustrative materials to give better comparisons,, even if not conventionally used.
- If the information on tables is expressed better in text then the table is irrelevant.
- Some internet references might not be credible.
- The research focus should address the relevant aspects of the question.
- The discussion is based on statistical analyses and other people's findings. The results are repeated only if being compared to external data.
- Large proposals could be split into 3 to 4 smaller ones to get funded.
- The real impact of the study should be emphasized in proposal writing, especially the new knowledge it adds, compared to what has been done before.
- The issues on how to deal with people in the study who have needs should also be addressed by making a statement.
- Ethical issues on the use of inducements can be addressed through the use of consent forms.

These comments are instrumental in the authors' improving of the manuscript, caution the authors on the flaws observed in science writing and are inevitably indicators of the need for training in science writing.

## STUDY DESIGN

By Dr. Erastus Njeru

Observational studies would normally be the starting point in research. Nevertheless, research is conducted after study design and statistical analysis methods are identified and clearly planned.

The various designs and their advantages and disadvantages were discussed (Appendix VII). Experiments without randomization are prone to biases and criticism. The terms data and information and population and samples were defined.

Statistical data analysis were discussed in detail and inferences to probabilities were given due attention. Types I and II errors occur in statistical analysis. One of the best methods of testing the null hypothesis is the p-value which can be computed using computer software and 0.005 is the cut off point. If p value is small the null hypothesis is false and if large, it is true. The null hypothesis is necessary for inferences to be made on the results.

## JOURNAL EDITING

### By Professor Bill Lore

The editing of the journal is based on scientific writing. Scientific writing tells the author how to write and editing checks what the author has written. Professor Lore used the *EAMJ* as the basis of his presentation.

He traced the development of the journal through its historical background to-date. *EAMJ*, is a peer-reviewed monthly journal of repute, published under the auspices of the East African Medical Association. It has been published uninterrupted since 1923. The Editor-in Chief position is honorary and not compensated. He works with a small secretariat of three regular staff. He was skeptical that the generation of honorary editors is coming to an end and young scientists are not willing to take up honorary editorship. This has made it difficult for him to identify a successor whom he can mentor. Yet this is very crucial for the future of this all important journal. He compared this with the *South African Medical Journal* which has an employed full-time Editor-in-Chief.

The scientific content is vetted by an Editorial Panel of eminent scientists in collaboration with international advisers. The standing committee of the medical association deals with the technical administrative and financial aspects of the journal.

The journal is distributed to about 4500 paid-up members of the association based on membership fee and to international subscribers, who are the majority and few local subscribers. Advertisements are mainly local

The journal is published on line and in print. It is in the process of being digitized, because binding of copies for storage is archaic and insecure, and is also considering open access to enhance its visibility though with due reservations. The editor was skeptical on the latter, considering the loss of income through free access, which is crucial for the very survival of the journal, especially in Africa. Hence, looking for a sponsor for such a venture. External authors are charged US\$ 50 non-refundable publishing fee, without which the paper would not even be considered for publishing. This was considered very high by the young scientists and they requested for a concession The Editor-in Chief gave them the opportunity to request for a small waiver and not exemption in writing, every time they submit a paper for publishing in *EAMJ*. The journal publishes its requirements in the journal twice in the year. Further information is in Appendix VIII.

The editors look for clarity in writing and expressing of ideas. The scientist need not try to impress or manipulate the editors with flowers of eloquence and literary ornaments in a research article. They should make simple and bold statements, without opinions or emotions. It was emphasized

that most scientists have sufficient English for scientific writing and about 80% of the readers do not have English as their first language.

## Editorial process

Once a manuscript is received to be considered for publishing, it is checked for compliance with the journal requirements on the check list. If it does not comply, it is rejected outright. If it does it is peer reviewed. Authors should be aware that journal space has become very precious and is reserved for only papers that merit publishing. Papers submitted without the publishing fee are also rejected outright. The process of peer review varies for every journal and has become a subject of controversy for many years. The reviewers check the content of the paper using editorial guidelines provided and within the time limit (about two weeks) specified by the editor. The guidelines vary with the requirements of the journals. Depending on the reviewers' comments the paper can be accepted, sent back to author for revision or rejected.

Lack or inadequate training of reviewers and authors is a limitation that needs to be addressed. Some reviewers give conflicting reviews and then it is up to the author to decide on the more scientifically valid. Authors sometimes feel slighted depending on the language used by the reviewer. However, the authors were advised to be very humble in considering these reviews as constructive and to respond to them by acknowledging the reviewers' input in improving their paper. In a covering letter, the authors should express themselves clearly by explaining what they considered valid and did.

The subject of review raised a spirited discussion, as usual without conclusion. The AAS was requested to consider conducting a workshop between editors, reviewers and authors to face some of the challenges head-on. The outcome could be the developing of a pool of good reviewers to be shared by the various medical journals. This could partly solve the problem of the shortage of good reviewers. Good reviewers are those who give good and timely reviews.

It was also noted that there is currently no African Association of Science Editors (AASE). This association has been very instrumental in developing editorial skills and standards and in keeping editors abreast of the contemporary editorial practices. Again the AAS was requested to revive this association in collaboration with the previous membership.

After revising of the paper by the author, the manuscript could be accepted or rejected, depending on the author's compliance with the reviewer's comments. When accepted it is assigned for copy editing, then typeset and designed for publication in an issue of the journal. The author is given about 24 hours to proofread the paper and make the final corrections for printing.

*(Nairobi, Kenya, 26 October 2006)*

AAS/IAMP workshop on scientific writing for young  
scientists and clinicians, held at the Hilton Hotel,  
Nairobi, Kenya, 23-26 October 2006

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**COORDINATOR'S REPORT**

**I. INTRODUCTION**

The objectives of the AAS/IAMP project covered key elements of good scientific writing, namely:

- (i) Study design;
- (ii) Conduct data collection, recording, analysis, interpretation and subsequent follow-ups;
- (iii) Science communication including writing grant proposals and progress reports as well as writing manuscripts for submission to journals; and
- (iv) Journal editing.

The above objectives were initially conceptualized at a meeting attended by Prof. G. B. A. Okelo, Prof. Elizabeth Heseltine, and Prof. Guy de The at the Institute of Medicine in Paris, France in December 2004.

**II. THE WORKSHOP: October 23-26, 2006**

The workshop was attended by young scientists from Ethiopia (3), Tanzania (3), Uganda (1), and Sudan (2). The three scientists from Kenya did not participate as there was a general strike by all Academic staff in the public universities. Also present were Prof. G. B. A. Okelo, former African Academy of Sciences (AAS) Secretary General, who is the coordinator of the project and who chaired the workshop. He highlighted the workshop objectives. Prof. Stephen G. Agong, the AAS Executive Director was present and spoke briefly on the AAS and its roles.

Lectures were delivered at the workshop by the following:

- (i) Prof. Elizabeth Heseltine
- (ii) Prof. William Lore, the Editor-in-Chief of the East Africa Medical Journal; and
- (iii) Dr. Erastus Njeru, a Senior Lecturer on Biostatistics at the University of Nairobi.

The topics they lectured on are listed on the attached programme.

While a detailed report on the proceedings is attached, it is important to highlight some important observations below:

- (i) The participants said that what they learnt was beyond their expectations, and that they emphasized the great need for this kind of project;
- (ii) Quite a number of them brought their research proposals which were critically analyzed and improved upon;
- (iii) It was generally recognized that the beneficial impacts of the workshop will be evidenced in the long run through improvements in publications of papers, grant proposals etc.
- (iv) The participants (trainees) suggested that there should be more emphasis in future workshop on: (a) Grant proposal writing, and (b) Peer review of articles.
- (v) The young scientists said they learnt a lot on:
  - Writing papers for journal publication;
  - Proposal writing;
  - Study design;
  - Data collection and interpretation;
  - Peer Review; and
  - Editing.

They recommended that more emphasis be put on these.

### **III. WAY(S) FORWARD**

Some lessons have been learnt from this first workshop and these lessons should help us improve upon the subsequent workshops. Below are some suggestions on the way forward:

- (i) Project proposal writing should be handled in depth in the next course(s). This is what the trainees recommended.
- (ii) Peer review should also be handled more in depth.
- (iii) Candidates should all be encouraged to bring with them their draft proposals and names of prospective funding agencies that they intend to approach. This will enable us to have more fruitful discussions on proposal writing and to discuss the expectations of the different funding agencies. This will make the workshop more hands-on.
- (iv) The next workshop should be held around October/November 2007 either in Senegal for Western Africa or in South Africa for Southern Africa.

Signed:

**PROF. G. B. A. OKELO**  
**Coordinator, AAS/IAMP Project**

*(Nairobi, Kenya - 26 October 2006)*

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**Hilton Hotel – NAIROBI – October 23-26, 2006**  
*(by country)*

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