CSIR-FOOD RESEARCH INSTITUTE

CSIR-FRI/AuthorAID

REPORT ON THE RESEARCH WRITING TRAINING WORKSHOP FOR RESEARCH SCIENTISTS AND TECHNOLOGISTS

HELD AT

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BY

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Acknowledgement

Sponsorship from AuthorAID is highly acknowledged. AuthorAID is a free international research community based at INSAP and is supported by the DFID and SIDA.

Acronyms

SIDA - Swedish International Development Agency

DFID - Department for International Development

CSIR - Council for Scientific and Industrial Research

FRI - Food Research Institute

INASP - International Network for the Availability of Scientific Publications

INSTI - Institute for Scientific and Technological Information

Chapter 1

1.1 Background

Poor communication and utilization of research findings in most developing countries has been associated with the lack of formal training in scientific writing and communication by researchers and technologists. This has resulted in a gap on research and scientific information sharing between these countries and the international scientific community. It is for this reason that the International Network established AuthorAID to provide support for researchers in developing countries and help them communicate their research findings through publications.

AuthorAID is a free international research community based at INSAP and is supported by the DFID and SIDA. It is a global network that provides support for researchers in developing countries. Its goals are to increase success rate of developing country researchers in achieving publications; and to increase the visibility and influence of research in the developing world. AuthorAID accomplishes this through networking, provision of resources, training and mentoring.

Through the AuthorAID initiative, a train-the-trainer workshop was organized for selected research scientists to equip them with the skills and tools to enable them write and present well-argued scientific papers. With the hope of institutionalizing AuthorAID training in scientific writing in research organizations, these research scientists are tasked with training other researchers (scientists and technologists) in their institutes/organizations.

This training workshop was therefore geared towards embedding AuthorAID Research Writing in CSIR-Food Research Institute. The 3-day training was aimed at improving the skill and strengthening the capacity of research scientists and technologists of CSIR-FRI to disseminate scientific and technical information through writing and journal publications.

1.2 Participants

Ten participants (5 Research Scientists and 5 Technologists) from all the technical divisions of CSIR-FRI attended the 3-day training workshop on Research Writing. A self-introduction of Facilitators, Guest Speakers and Participants was done before the beginning of workshop proceedings. The participants indicated that improving on their science communication skills through research writing was their major goal for attending the training. Participants' expectation was that at the end of the training, they would have learnt and developed the skills of research writing. They also hoped that acquiring these skills would enable them write better manuscripts that would be acceptable for publication in high impact journals.

Figure 1: Introduction of guest speakers and participants

1.3 Address by Director, CSIR-FRI

Dr. Nanam Dziedzoave, Director of CSIR-FRI thanked AuthorAID and the local team of facilitators for presenting a wonderful opportunity to train researchers and technologists in scientific writing. He conceded that real challenges confront researchers and technologies in the area of scientific reporting and communication and therefore this training workshop for staff of CSIR-FRI would be very beneficial. He noted that over the years, challenges to writing and publication had affected the promotion of many researchers and technologists. It had therefore become imperative, in the light of the review in promotion criteria, to organize more training in scientific writing for staff of the Food Research Institute and CSIR.

In conclusion, he urged participants to take advantage of the rare opportunity offered and commit themselves to learning the skills of scientific writing so that they could write in a manner acceptable by the research profession. He welcomed participants to the training workshop and wished them fruitful learning and discussions.

1.4 Introduction to AuthorAID by Director, CSIR- INSTI

Dr. Joel Sam, Director, CSIR-INSTI and co-ordinator of AuthorAID, Ghana informed participants that the training was the first in a series of six workshops to be organized in the CSIR, according to the AuthorAID project. He introduced AuthorAID as one of the pioneering projects of INSAP, which seeks to support developing country researchers in publishing and communicating their research findings. He said AuthorAID provides mentoring and training for scientists in science communication and also helped in disseminating scientific information. He was delighted about the fact that participants were both research scientists and technologists because the training would be most beneficial to these staff members of the CSIR.

He told participants that the upward review of requirements for promotion calls for the development of skills and capacity of researchers and technologists in research writing, hence the training workshop. He entreated participants to visit the AuthorAID website (www.authoraid.info) for more information on research writing, peer group discussions,

mentoring of younger scientists by experienced scientist and a host of other programmes initiated by INASP, under the AuthorAID project. He concluded by congratulating participants for attending the workshop and entreated them to learn the skills of research writing and thereafter begin to practice so that they could also share their research findings through publications in high impact journals.

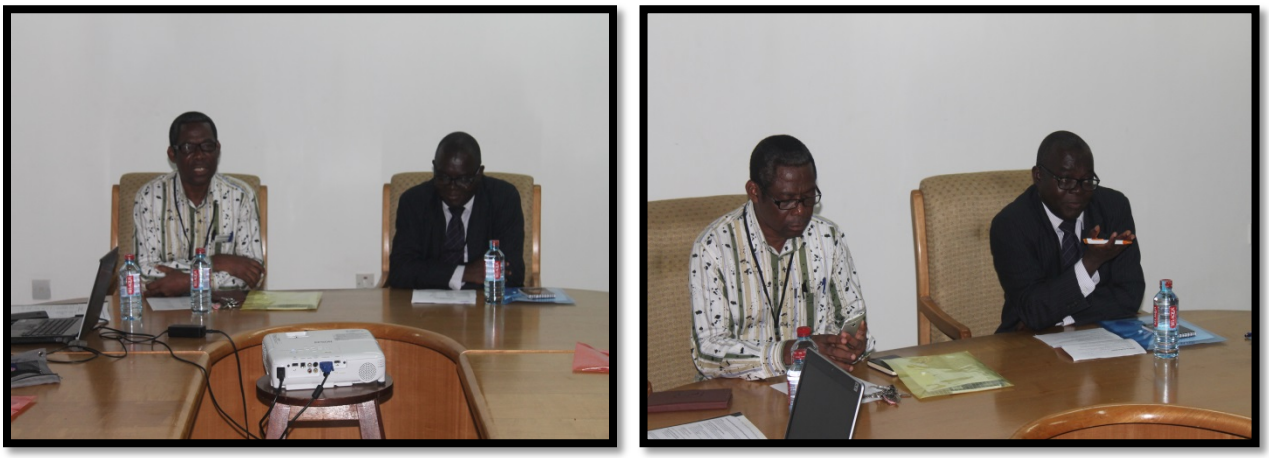

Figure 2: Welcome address by Dr. Dziedzoave and Introduction to AuthorAID by Dr. Sam

Chapter 2

2.1 Lessons on Scientific Writing

2.1.1 Introduction to Scientific Writing

Introduction to Research Writing was presented by Dr. W. Amoa-Awua (Chief Research Scientist, CSIR-FRI). He said the main reasons for research are to contribute to knowledge, solve problems and bring about development. Therefore, communication of research findings must be accurate, clear and adapted to its audience. Research findings could be disseminated through reports, presentation, journal articles, etc. He mentioned that the research process involves identifying the problem, formulating objectives and hypotheses, testing hypotheses through experimentation, data collection and analysis, interpreting and drawing conclusions. He said documenting and communicating the results are the final stages of research.

He highlighted the basic elements of a scientific paper and briefly spoke about these elements and their importance in science communication. Dr Amoa-Awua also outlined the responsibility of authors and the ethical considerations associated with research and research communication. He gave participants some points to consider when selecting a journal and urged them to strive to publish in high impact journals. He explained that this was the surest way to attain high readership. He also mentioned that journals are ranked periodically and therefore participants should be abreast with these rankings of high impact journals. As an example, he shared was the 2013, Sclmago Journal Ranking (SJR) with participants.

Dr. Amoa-Awua completed his lesson with an exposè on the peer review process which precedes an article publication. He said the goal of the review is to assess the strengths and weaknesses of a manuscript, offer constructive criticisms and make suggestions to improve it. He therefore recommended that participants should possibly ask their colleagues to read through their manuscripts before submitting to a journal for publication. He concluded with a word of advice that the best way to develop the skill of scientific writing is to practice continually.

2.1.2 Planning to write

The lesson on “Planning to write” was facilitated by Dr. Mary Obodai. She set the tone for the lesson by helping participants to establish the correct mindset in research writing. She also introduced them to the ethical considerations needed in science communication and cited an example of falsifying data as a breach of research ethics. She made a point of the need for clarity in science communication and the logical approach used in research writing.

Dr. Obodai told participants that data for scientific papers may be selected from thesis, technical reports, on-going or completed research, but the key point is to present data that is relevant to the scientific community. As part of planning to write a manuscript for publication a particular journal should be targeted and this choice may be influenced by the focus and aims, format and style of the journal. Other factors she mentioned for consideration while selecting a journal included frequency of publication, type of articles and conditions for submission.

She advised participant to select less prestigious journals, as beginners. She said that although publishing in international journals brought greater rewards and enjoyed wider readership, it requires a lot more effort to publish in these journals. She was quick to add, however, that if the manuscript has sufficient merit and is particularly interesting to a broad audience then the author(s) must consider sending it to the best journal.

Finally, she recommended that participants prepare adequately and approach writing as a project, since writing is complex and time-consuming. She told them to allot time for writing in their schedules because the key to completing a manuscript is to stick to a schedule.

2.1.3 Writing the sections

The session on "writing the sections of a paper" was treated by Dr. Charles Tortoe. This lesson covered the complete structure of a journal manuscript and how to write them up. He started the lesson by addressing the title, abstract and key words of a journal paper. He told participants that these sections are as important as the body of the paper. He said the title is the first to be read by the audience and therefore must be crafted carefully to reflect the content of the paper. He said the "title", together with "keywords" is used by indexing and abstracting service providers and search engines and advised that these be chosen carefully. Dr. Tortoe told the trainees that the abstract presents a general summary of the manuscript and is composed of the various sections of the main paper. He said the style and word limitation for abstract, however, varies from one journal to another.

Dr. Tortoe introduced participants to the IMRAD format, which is the most common format in which scientific articles are organized. He said the introduction section of a manuscript provides background, literature, identifies the hypothesis and defines the objectives of the research. According to him, the methodology is one of the easiest sections to write and to allow others to replicate and evaluate the study and determine if findings of the research seem applicable to other situations. He said this section of the manuscript must be written in the past tense and must be accurate and concise. The methodology also captures the equipment used, population and or study area as well as statistical tools and analysis used. He told participants that the results section is the core of the paper and often includes tables and or figures, which summarizes the findings of the study. He said this section should also be written in the past tense and must present the findings of the study, without necessarily any commentary. He was quick to add that this section, in some journals, is combined with the discussions.

The discussion section, perhaps, is one of the most difficult sections of a manuscript to write. He said the discussion often begins with a brief summary of the main findings and should address the questions or hypotheses of the study. He stated that the implications of the study as well as limitations may be included in this section of the manuscript. That notwithstanding, he cautioned participants against writing excessively lengthy discussions, which may include information that may not be relevant to the context of the topic or research. He said, depending on the journal,

conclusions may be stated at the tail end of the discussions or even separated and presented after the discussion section.

He also took participants through references and its importance, authorship and acknowledgements. These, he said, are also essential elements of a paper. He suggested a few referencing software (including Zotero, Endnote and Mendeley) that may be useful to participants.

Dr Tortoe's final lesson was online resources for scientific writing. He briefed participants on information provided by some websites that may be relevant to research writing. He admonished them to utilize these resources as they embark on their writing projects. Finally he advised participants to be weary of journals in which they wished to publish, since some journals have been classified as standalone or predatory.

2.1.4 Submission and Post submission

Dr. Margaret Owusu took participants through the lessons on submission and post-submission of manuscripts. She said these form the last part of manuscript preparation. Topics discussed under this lesson were; reviewing manuscripts, writing cover letters and submission of manuscripts, handling reviewer comments and proof checking.

Dr. Owusu told participants to revise their manuscripts by checking grammar, spelling, logical flow of ideas, accuracy etc, and also advised them to use feedback from colleagues and co-authors in order to put the manuscript in good shape. She further advised that revision of the manuscript must be done to comply with the instruction of the target journal. However, she cautioned participants against the temptation of revising the manuscript indefinitely. Regarding the reviewer comments, she told participants to be ready for criticisms, contrary opinions and suggestions or even outright rejection of their manuscript. She said manuscripts are peer-reviewed and critiqued to make them better and urged participants not to lose hope when their manuscripts are criticized or even rejected. In a situation where one disagrees with comments by editor or reviewer, she advised participants to write a polite rebuttal to explain one's position if the need arises.

Dr. Owusu concluded the lesson with the section on proof checking. She explained its importance and therefore suggested that all the authors of a manuscript must be involved in the final checking. She said authors should send their responses to the editor before the deadline given, otherwise the publisher may go ahead and publish the manuscript as it is.

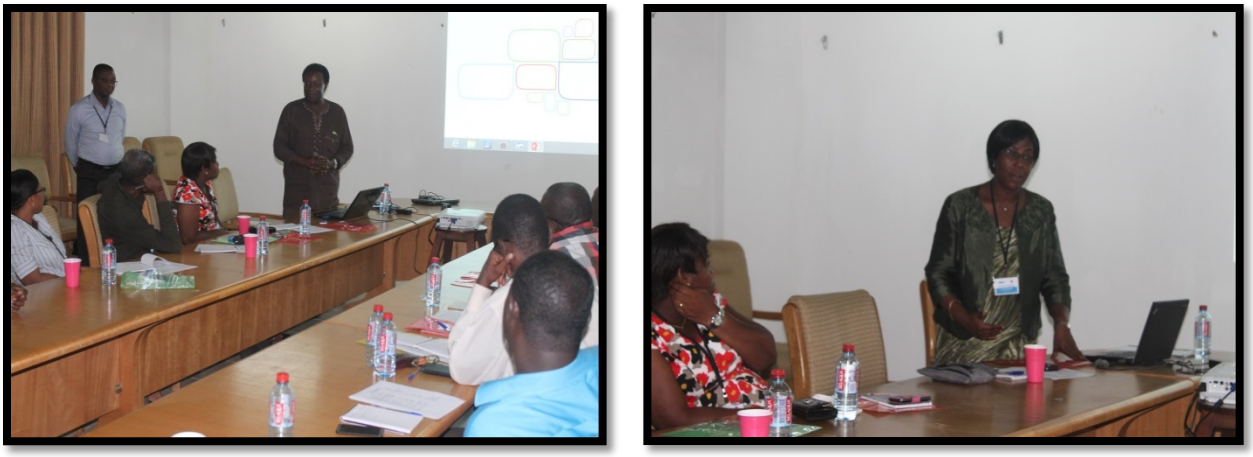

Figure 3: Guest Speaker

Figure 4: Facilitators

Chapter 3

3.1 Group discussions and presentations

After the session on research writing, participants were put into 3 groups (Appendix D) and each group assigned to a specific topic for discussion. The group assignment lasted for 1 hour after which each group was made to share its findings through a presentation for 10 minutes. Five minutes was allowed for questions and discussions after each group's presentation.

3.1.1 Group 1:

Topic for discussion by Group 1 was "Challenges in Research Writing and their Solutions". The 4-member group discussed the issue pertinently, identified some challenges to research writing and proposed solutions. A summary of their findings is presented in Table 1.

Table 1: Challenges to research writing and proposed solutions

Challenges	Proposed solutions
Inappropriate research topic	The topic must be concise, clear and achievable
Unavailability of current methods	Collaborative research
Improper analyses of results	Engage a statistician
Improper interpretation of results	In-depth knowledge of the subject area
Low commitment by team members	Self-motivation, commitment and setting of timelines
Difficulties in presenting appropriate information out of the entire research	Consult literature (journals etc), experts, scientists
Lack of internal peer review	Must be peer reviewed
Lack of access to resources	Use appropriate e-resources
Lack of information searching skills	Use appropriate e-resources

Figure 5a: Group 1 discussions and presentation

3.1.2 Group 2:

"Training needs for Research Scientists and Technologists" was the topic for discussion by Group 2. Members agreed that periodic training of scientists and technologists was critical in the realization of a research institution's mandate because this would make its workforce efficient and more productive. Some critical areas of training suggested were as follows:

- Scientific writing and reporting
- Grants proposal writing
- Presentation skills
- Experimental design and statistics
- Project management
- Communication skills
- Laboratory ethics and management
- Quality management
- Instrumentation and equipment management

Figure 5b: Group 2 discussions and presentation

3.1.3 Group 3:

The 3rd Group was given "The importance of research collaboration" to discuss. They concluded that research collaboration enhances productivity. Highlights of the importance of research collaboration, as suggested by Group 3 are that it:

- Helps in drawing on each institutions strengths and opportunities
- Facilitates knowledge sharing
- Builds capacity of employees
- Enhances organizational creativity and image
- Enhances optimum application resources
- Promotes interdisciplinary research
- Builds network among institutions

Figure 5c: Group 3 discussions and presentation

3.2 One-on-one Writing Clinic

On the 3rd day of the training workshop, a one-on-one writing clinic was organized for participants. At this session, each participant was assigned to a facilitator for a face-face interaction (Figures 6a & 6b). The aim of this writing clinic was to discuss weaknesses and challenges they encounter during writing. Also participants who had manuscripts ready or in preparation were made to bring them to this writing session so that facilitators would help fine-tune it and further develop it for publication

Figure 6a: Facilitators and participants in one-on-one discussions

Figure 6b: Facilitators and participants in one-on-one discussions

Chapter 4

4.1 Pre-assessment

Pre-assessment tests before the start of the training workshop indicated that the participants were moderately knowledgeable about research writing. That notwithstanding, they needed further training to develop their knowledge and skill better in order for them to write better scientific papers that are acceptable for publication in reputable journals.

4.2 Post-assessment

Post-assessment of participants showed a marked improvement in their understanding of research writing and science communication. Indeed, participants indicated their readiness to write manuscripts for publication in reputable journals. They also expressed willingness to further develop their writing skills in order for them to effectively share their research findings with the scientific fraternity.

4.3 Evaluation

The final event of the 3-day training, participants were made to evaluate the workshop, using a questionnaire (Appendix E). The questionnaire contained both open and closed ended questions and also had a section for collecting brief background information of participants. Each participant was made to complete and return one questionnaire for collation, data entry and analysis.

All ten participants concurred to the fact that the training workshop and the course content were relevant to their work. They conceded that their knowledge had been improved markedly after the training. Although a majority of participants said the venue was convenient and conducive, others thought that it was not and they cited distraction with daily routine work as their reason. The participants' assessment of facilitators was positive. According to them the facilitators had a good command of the art of research writing and were also able to teach the topics to their understanding. They agreed unanimously that having acquired the skills in research writing through this training, they were now ready to write a paper for publication.

Some of the suggestions given by participants for improvement of the course in future were as follows:

a. The course should be residential and should be held away from the Institute.
b. Training should be held over 5 days so that a lot more time could be dedicated to each topic.
c. Hard and soft copies of presentations should be made available to participants at the beginning of the training workshop.

Chapter 5

5.1 Presentation of certificates

Presentation of certificates were done by Dr. Joel Sam, Director of CSIR-INSTI and assisted by Dr. Obodai, Deputy Director of CSIR-FRI. All 10 participants were presented with a certificate of participation and a pen-drive which contained all presentations.

Figure 7: Presentation of certificates

5.2 Lessons learnt

- Participants agreed that training in research writing is very important for research scientists and technologists, since this would equip them with the skills to better communicate their research findings with the rest of the science fraternity.
- The training workshop helped the participant to gain more knowledge, to understand, grasp and develop the skills in writing for publication in peer-reviewed journals
- Refresher workshops should be organized frequently for research scientists and technologists of the CSIR
- Participants requested further training in design of experiments and analysis of scientific data.

5.3 Closing remarks by Deputy Director, CSIR-FRI

The Deputy Director, FRI, Dr. Mary Obodai congratulated participants for successfully attending the training workshop and also thanked them for their contributions in making the programme a success. She admonished them to begin to practice the skills acquired from the training in order to develop it further. She also assured participants of the facilitators support and urged them to approach the facilitators when they encountered any difficulties in research writing. Finally she thanked INASP /AuthorAID for their sponsorship of the training workshop.

5.4 Recommendations

Training research scientist and technologists in research writing is essential for communicating and sharing findings of their research with the science community. This workshop brought out some interesting but rather important issues, which will improve future research writing workshops and build the capacity of researchers and technologists to prepare and communicate research findings better. These included the following:

- Future workshops must be residential and held at a location away from the Institute
- Subsequent training workshops should begin on a Tuesday, instead of a Monday
- Training be held for at least one week, because of the nature and volume of the content to be covered
- Training on experimental design and data analysis would equip scientists and technologist to design better experiments that would generate meaningful and analyzable data. This would make communication of findings more efficient
- A training program on proposal writing would help build the capacity of researchers and technologists to develop proposals and win grants to conduct research.

Appendices

Appendix A: Participants list

No	Name	Designation	Division
1	Evelyn Buckman	Research Scientist	Food Nutrition and Socio-Economics
2	Amy Atter	Research Scientist	Food Microbiology
3	Nina Bernice Ackah	Research Scientist	Food Microbiology
4	Peter Addo	Research Scientist	Food Processing and Engineering
5	Raphael Kavi	Research Scientist	Commercialization and Information
6	Theophilus Annan	Technologist	Food Microbiology
7	Frank Mboom	Technologist	Food Nutrition and Socio-Economics
8	Vincent Kyei-Baffour	Technologist	Food Chemistry
9	Nelson Amey	Technologist	Food Chemistry
10	Solomon Dowuona	Technologist	Food Processing and Engineering

Appendix B: Pre-assessment questionnaire

FRI-AUTHORAID TRAINING ON RESEARCH WRITING
PRE-ASSESSMENT QUESTIONNAIRE

1. Full Name……
   ……

2. Division…….....
   .....

3. Which section is the most difficult to write
   a. Introduction
   b. Results and discussions
   c. Conclusion
   d. Abstract
   e. Materials and methods

4. Can you submit your manuscript to different journals at the same time
   a. Yes
   b. No
   c. Don't know
5. What is the correct order of writing a manuscript?

   Please state

6. When your paper is rejected by a journal what do you do?
   a. Do nothing
   b. Send it to another journal
   c. Review it and send to another journal
7. Can you cite an abstract without reading the full article

   a. Yes
   b. No
   c. Don't know
8. Can you include a colleague who was not a part of the research, as a co-author?
   a. Yes
   b. No
   c. Don't know
9. Who should be the lead author even though you have written the paper?
   a. Your supervisor
   b. Your Head of Division
   c. Project leader

d. Yourself

10. What do you do when you cannot access the full text of a paper?
    a. Look for another paper
    b. Contact the author(s)
    c. Contact the editor of the Journal
    d. Contact your Institute’s librarian for assistance

Appendix C: Post-assessment questionnaire

Online assessment was conducted by AuthorAID based at INSAP.

Appendix D: Group list

Group 1	**Group 2**	**Group 3**
Evelyn Buckman	Peter Addo	Nina Bernice Ackah
Amy Atter	Theophilus Annan	Raphael Kavi
Frank Mboom	Solomon Dowuona	Vincent Kyei-Baffour
Nelson Amey		

Appendix E: Training Evaluation form

FRI-AUTHORAID TRAINING ON RESEARCH WRITING
TRAINING EVALUATION FORM

Age:…… Gender: M/F

Division:……..

1. Was the training relevant?

   a. Yes
   b. No
   c. Not sure

2. Was the duration of the training adequate?

   a. Yes
   b. No
   c. Not sure

3. Were the presentation topics relevant to your needs?

   a. Yes
   b. No
   c. Not sure

4. Was the time allotted for each topic adequate?

   a. Yes
   b. No
   c. Not sure

5. Was the venue convenient/conducive?

   a. Yes
   b. No
   c. Not sure

6. What was your knowledge of research writing just before you attended this workshop?

   a. I knew a lot
   b. I knew a moderate amount
   c. I knew little
   d. I knew nothing

7. At the end of the course what do you think of your knowledge of research writing?

a. I know a lot
b. I know a moderate amount
c. I know a little
d. I know nothing

8. Do you feel you are now ready to write a research paper for publication?

a. Yes
b. No
c. Not sure

9. What are your assessment of the facilitators and their style of presentation

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10. Can you suggest any changes for improvement of the course?

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