TRAINING YOUNG ANIMAL SCIENTISTS IN WRITING AND PRESENTATION SKILLS – EXPERIENCES FROM THE ELSEVIER/EAAP WORKSHOP

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INTRODUCTION
Communication of ideas and experimental results is an essential part of the scientific research process. Scientists are judged by their ability to communicate through written papers and conference presentations. Even the most elegant research project has no value unless its findings can be presented in a clear, effective manner. Young scientists and students need training as much in the techniques of scientific communication as in experimental techniques. The objective of this paper is to outline our experiences of running workshops on writing and presenting scientific papers. The workshops are run in conjunction with the annual meetings of the European Association of Animal Production (EAAP). Our approaches can be adopted for similar workshops, or can be incorporated into university curricula.

BACKGROUND
Each year since 1998, as part of its annual meeting, EAAP has sponsored (jointly with Elsevier Science since 1999) a full-day workshop on Writing and Presenting Scientific Papers. The workshop is aimed at active scientists and teachers, especially young scientists and those awarded scholarships to the EAAP meeting.

The objective of EAAP is to promote, by means of active international cooperation, the improvement of animal production and the advancement of scientific research and development. The initiative for a workshop on writing and presentation was taken by Prof. R.D. Politiek, former Editor in Chief of the official scientific journal of EAAP, Livestock Production Science (LPS), published by Elsevier Science. Many papers submitted to LPS are rejected because they do not meet the standard of scientific writing. It is difficult to judge the scientific quality of a paper, if one cannot understand what the author means. One goal of the Elsevier/EAAP workshop, therefore, is to improve the quality of scientific writing. The annual EAAP meeting and other congresses provide an opportunity for scientists to present results of their research, either orally or as a poster. Presentations often vary in quality, and it is difficult to catch the main messages if one cannot understand what is presented. Another goal of the workshop, therefore, is to improve the quality of oral and poster presentations.

The workshop has been very successful, and it seems that many young scientists have not received any previous teaching on techniques for writing and presenting scientific papers. Therefore, at its 2001 meeting in Budapest, EAAP decided to make the workshop a regular feature of the annual meetings. They also created the annual Rommert D. Politiek Award for
Best Poster Presentation. To reach a wider audience, we three workshop leaders put our ideas on science communication into a book published by Nottingham University Press (Malmfors et al., 2000).

WORKSHOP ORGANIZATION
The idea of a workshop is to have the participants fully engaged in activities. We employ the technique of “active learning,” therefore, in which participants are given group tasks to be completed within 30-60 minutes. Thereafter they report their results and discuss them in plenum. Each task is preceded by a short introductory lecture. The language of instruction is English (American and British!), although participants come from many countries.

The full-day workshop starts with a plenary session for introductions and a short lecture on the importance of communicating science and how it relates to the research process. Thereafter, the program is divided into two 3½-hour sessions, including short coffee breaks. One session is devoted to “Techniques for Scientific Writing,” and the other is devoted to “Techniques for Oral and Poster Presentations.” All participants take part in both sessions. A workshop with up to 20 participants is divided into four groups of five each. We consider five to be the maximum number of participants per group. The participants are usually asked to form groups, but we urge them to mix to avoid groups representing only one country or only one scientific discipline. We always have an even number of groups, e.g., four groups of five, so that groups can be paired; each pair receives the same scientific paper to work on in a task. Pairing groups provides friendly “competition” between groups within pairs. If there are more than 20 participants (in 2001 there were 37), then we run parallel sessions. In the morning about half the participants are in the session on scientific writing and the other half are in the session on oral and poster presentations; in the afternoon they switch.

Session on scientific writing. In the session on writing, there is a short lecture on the sections of a scientific paper, following IMRAD (Introduction, Materials and Methods, Results and Discussion), with emphasis on Title and Abstract because of the limitation of time. Focus of the lecture is on techniques for scientific writing, including coherent writing, i.e., the logical sequence of sentences, and making writing easier to read, e.g., concise writing, parallel writing, logical transitions. It is emphasized that a title should be informative, by describing the subject of the research; specific, by differentiating the research from other research; and concise, by saying only what is necessary. An abstract should state the objective clearly, should summarize the major sections of the paper (IMRAD), should be concise to meet the limitation in length, and should stand alone. Above all, participants are taught that effective scientific writing should be clear, so the reader gets the message; complete, so the reader’s questions are answered; correct, so the message is accurate, and efficient, so as to save the reader’s time.

After the lecture, participants are given the task to improve the title and abstract of a published scientific paper, working in their groups. The groups write their suggested improvements on a transparency copy of the title and abstract, and report in plenum. Pairs of groups get the same paper, which makes the reporting more efficient and constructive. After a break, there is a second short lecture focussed on using tables and figures in a scientific paper. Participants are advised that tables are used to focus on specific data or estimates of
parameters, whereas figures are used to focus on general relations among those data or estimates. It is stressed that a table should be concise, by avoiding repetitive information or by excluding data that can be computed; and should stand alone. An improved figure should be the one that is most appropriate to show desired relationships, and should also stand alone. Appropriate figures include pie charts, used to compare a part to the whole; bar charts, to compare one item to another; line graphs to compare responses, and scatter diagrams, to show a relation between two variables. Above all, participants are taught that effective tables and figures should be clear, concise, logical, and informative. Groups are then provided with a table and a figure from a published scientific paper, and given the task of improving them on a transparency copy. Again, pairs of groups get the same materials. Reporting is done in the same way as in the exercise on title and abstract.

Session on oral and poster presentations. The session on presentations starts with a lecture on oral presentation and use of visuals. It is emphasized that successful presentations can be done in different ways, as long as the message gets across. Every oral presentation, however, should be attractive, interesting, well structured and easy to understand, and have a clear message. Visuals should support the message, and not be overloaded or distracting; text and figures must be large enough to be read by those sitting at the back of the room. Participants are taught that a good oral presentation should be adapted to the audience, be brief, and be clear, and that the presenter should face the audience, speak to be heard well, and show interest!

Groups of participants are then given the task of preparing and delivering a five-minute oral presentation (including visuals), using information from a published scientific paper. It is sufficient and time-effective to provide only a one-page summary covering essentials from the main sections of the paper, together with one or two key tables or figures. The same paper is given to two groups, and it is interesting to see how the presentations may differ. Participants critically assess each other’s presentations in a constructive manner, with guidance from the tutors. This exercise is extremely valuable for the assessors as well as the presenters.

In the second part of the session, participants get a brief introduction on poster presentation. In groups, they then evaluate about 10 posters (scanned photos, printed on A4 sheets) presented at scientific meetings, and discuss their observations in plenum. Participants become aware of that a good poster is attractive and informative, and not overloaded; and that it has a harmonious layout and a good balance between text and illustrations. The title and text should be clear, concise, and easy to read from a distance. The main message should be highlighted centrally on the poster. Further, more detailed information should be available in a handout, unless provided in a conference paper.

COMMUNICATION SKILLS IN THE UNIVERSITY CURRICULUM

The first two workshops included a session on how to incorporate writing and presentation skills into the university curriculum. Traditional university teaching methods, such as lectures, do not lend themselves easily to active learning. Sometimes there is also reluctance by lecturers to devote time to communication skills that would otherwise be used for teaching their subject. It is possible to train students in writing and presentation, however, by using examples that are
relevant to a specific subject. The techniques used in our workshops – small group evaluation or presentation of published papers – can be adapted to any subject area. Where class sizes are large, students can jointly prepare oral presentations or posters for a mini symposium that might replace several lectures. In addition to learning writing and presentation skills, students also acquire other transferable skills, such as working in groups and working to deadlines. Furthermore, their overall learning experience is enhanced.

WORKSHOP EVALUATION
The participants attending the four workshops given since 1998 have all been very active and motivated to learn. Their performance in the group activities has shown that they quickly adopt the messages given in the lectures. Although most participants had no previous experience of reviewing papers and presentations, they usually made very good suggestions to improve the papers and posters used in the exercises, as well as the oral presentations done by groups.

Participants are asked to evaluate the workshop by filling an evaluation form. The evaluations show that the workshop is highly appreciated by the participants. Their grading for “overall impression” has on average been 4.7, 4.6, 4.7 and 4.8 for the four workshops (scale 1-5, where 5 means very good). They find the workshop useful and worthwhile, and appreciate the mix of short lectures and group activities, as well as the opportunity to exchange ideas and experiences with colleagues from other countries. Participants agree that it is good to have a workshop on writing and presentation just before a scientific congress. Not only does it provide motivation, but there is also the opportunity to reinforce learning by viewing and reviewing papers and presentations during the congress. Finally, they feel that the knowledge and awareness achieved during the workshop will benefit their writing and presentations in the future.

CONCLUSIONS
- It is essential that young scientists be trained in writing and presentation techniques as part of their scientific education.
- Effective communication conveys your message in a way that is accurate, audience-adapted, brief and clear.
- Active learning is a very efficient way of teaching communication skills, because participants reflect upon and process information, and they also help each other to learn.
- Writing and presentation skills can be incorporated into the university curriculum by using subject-specific examples

REFERENCES