

## AMEE GUIDE

# Creating effective poster presentations: AMEE Guide no. 40\*

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## Abstract

Poster presentations have become an important part of professional meetings and are recognized as valuable tools for teaching and assessment. An effective poster is a visual communication tool that will help you engage colleagues in conversation, convey your main point to large numbers of people, and advertise your work. An effective poster is a highly condensed version of a research paper constructed primarily of visual displays of data with just enough supporting text to provide context, interpretation, and conclusions. A new AMEE Guide, 'Creating Effective Poster Presentations', provides guidance and is illustrated with annotated examples.

## A new look at scientific meetings

Maugh (1974) declared the poster session 'a new look at scientific meetings' and its first use at a major meeting in the United States as a smashing success. More than 20% of the 2200 papers at the joint meeting in 1974 of the American Society of Biophysical Chemists and the Biophysical Society were presented as posters. Poster presenters and viewers alike appreciated the two-way exchange, and the potential for more in-depth discussion and personal interaction than oral presentations afforded.

Since then, poster sessions have become common at scientific meetings, in part through necessity as the number of scientists vying for presentation slots met limitations of time and space at meetings. For example, the 2008 meeting of the Ecological Society of America hosted approximately 1150 contributed oral presentations and 700 posters (38% of total) during a 5-day period (ESA 2008). At the annual meetings of the Association for Medical Education in Europe (AMEE), posters have increased in both number and proportion of presentations. The 2001 meeting in Berlin saw 283 short communications and 117 poster presentations (30% of total; AMEE 2001). The posters were presented in 12 theme groups on a single day. During the 2008 meeting in Prague, some 450 short communications and 600 posters (57% of total) were offered; posters were presented in 31 theme groups over 3 days (AMEE 2008).

Posters have also been recognized as valuable tools for teaching and assessment. In the classroom, they can provide a mechanism to promote teamwork, develop presentation and communication skills, and enhance critical thinking and analysis skills (e.g. Moneyhan et al. 1996; Bracher et al. 1998; Hess & Brooks 1998; Costa 2001). They also offer an alternative to essays and written papers for the assessment of student work (e.g. Pelletier 1993; Moule et al. 1998; Akister

## Practice points

- Poster presentations have become an important part of professional meetings. They are also recognized as valuable tools for teaching and assessment.
- An effective poster is a visual communication tool that will help you to engage with your colleagues in a conversation, convey your main point to large numbers of people, and advertise your work.
- Designed as an illustrated abstract, an effective poster is a highly condensed version of a research paper.
- Posters comprise primarily visual displays of data with just enough supporting text to provide context, interpretation, and conclusions.
- A new AMEE Guide, *Creating Effective Poster Presentations*, provides guidance and is illustrated with annotated examples.

et al. 2000). Chute and Bank (1983) suggest a class poster session as a time-saving alternative to spending '... half of the course listening to nervous undergraduates awkwardly drone on in the usual seminar fashion'. Poster competitions for graduate students are also held at some professional meetings, garnering prestige, recognition and even monetary rewards for up-and-coming scientists.

Although the importance of posters as a tool for communication, teaching and assessment seems clear, we have noticed that presenters often do not take full advantage of the medium. In our personal experience, we have found that many posters are hard to read, poorly organized, overloaded with text, and lacking in effective visual displays of data. In 1999, one of us (Hess unpublished data) evaluated all 142 posters at the national meeting of a professional society.

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The main criteria in his '60-second poster evaluation' were overall appearance and the ease with which key pieces of information could be located (Hess 1999). Many of the posters were cluttered or sloppy (33%) and had fonts that were too small to read comfortably (22%), especially in the figures (44%). Research objectives (38%) and main points (42%) could not be found on many posters within the 1 min review period. Smith et al. (2004) demonstrated that such quick-scoring techniques are a good indication of overall quality. They found that a 15-second quick-scoring technique, focused largely on visual and organizational elements, was highly correlated ( $r=0.75$ ) with more detailed scoring of the same posters.

The problems identified in many posters diminish their communication value for all but the most determined readers. Once authors are made aware of them, these problems are easily fixed. Medical and nursing educators have long dominated the literature examining the use and preparation of posters, both for professional meetings and as teaching and learning tools. Indeed, the overwhelming majority (nearly 75%) of the ca. 125 peer-reviewed articles in Brownlie's (2007) comprehensive annotated bibliography of the literature are from medical and nursing journals. Poster presenters should have access to straightforward guidance to help them to create more effective posters. That is the purpose of the new AMEE guide and the associated web site, *Creating Effective Poster Presentations* (Hess et al. 2008).

## Creating an effective poster presentation

A scientific poster is a relatively large (1 × 2 m) visual display designed to convey research findings. An effective poster is a visual communication tool that will help you engage colleagues in conversation, convey your main point to large numbers of people, and advertise your work. Posters use ordered text and graphics to present a single message, are left unattended a day or longer for meeting participants to review at their leisure, and usually have a scheduled 1–2 h period when the author(s) are to be available for discussion. In some conferences, like those of the AMEE, poster presenters are also required to deliver a 2–3 min highlight speech to help generate interest in their work.

Despite the notion among some researchers that posters are 'second class' when compared to oral presentations, we argue that there are many reasons to prefer poster presentations:

- You have the potential to reach a larger audience. Only those directly interested in your field may attend an oral presentation, whereas scientists in related fields are likely to stroll through a poster session. If your poster is visually interesting and graphically informative, you can capture their attention.
- It is much easier to talk with people during a poster session – even the big names in your field may stop at your poster. Thus, you can begin to develop professional contacts and networks.
- You have the opportunity to present your information in a wide variety of formats. In addition to your poster, you

can also use handouts, additional photographs, and even computer simulations to deepen your conversation with interested colleagues.

- You can respond immediately to any criticism of your work, including improving your approach when the criticism is warranted.
- While an oral presentation is linear, poster presentations provide multiple points of entry for viewers. Different people will be interested in different parts of your work so that conversations can all start differently (you should be prepared for this). You will also have the opportunity to try different explanations if the ones you rehearsed are proving unconvincing.
- Many people find the poster session format less stressful than an oral presentation.

Like an effective oral presentation, an effective poster presentation requires thoughtful and careful preparation. In today's era of computers, digital text and graphics, and large printers, actually assembling and printing posters is not difficult. A poster, however, is not simply a manuscript hung on a board or a set of PowerPoint slides printed on a single, large sheet of paper. In fact, a compelling case can be made for thinking of a poster as an illustrated abstract – a highly condensed version of a research paper constructed primarily of visual displays of data with just enough supporting text to provide context, interpretation, and conclusions.

There are numerous 'how-to' guides available for poster presentations (see Brownlie's 2007 bibliography for an extensive list). There are common themes that occur repeatedly, including:

- Developing a short, large, results-oriented title to convey results and attract attention.
- Using visual elements to tell your story: photographs, graphs, and drawings.
- Minimizing text, using just enough to provide context and explain your visual elements and conclusions.
- Maintaining a large, easy-to-read font throughout the poster.
- Using appropriate headings to organize your poster and guide viewers.
- Keeping your poster bright, colourful, and uncluttered.
- Being prepared to speak about your poster.
- Making sure you are with your poster during your assigned time.
- Preparing a summary handout that people can take with them.

We have developed the new AMEE Guide to creating effective poster presentations to synthesize these key points, illustrated by example posters annotated with notes describing what works and what could be improved. For many people, the Guide will provide the information needed to markedly improve their posters. For those who want more, the Guide is actually a summary of more detailed information found on our website (Hess et al. 2008). The website is currently in its fourth edition, and has benefitted from comments and requests from around the world. We expect to add video content in the near future – short modules describing how to create effective posters, all backed with real-life examples.

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## References

- Akister J, Bannon A, Mullender-Lock H. 2000. Poster presentations in social work education assessment: A case study. *Innov Educ Train Int* 37(3):229.
- Association for Medical Education in Europe (AMEE). 2001. Medical education and standards at a time of change: Programme and abstracts for annual meeting, Berlin, Germany. Available online at: URL=<http://www.amee.org/documents/AMEE%202001%20Programme%20and%20Abstracts.pdf> (accessed 16 January 2009).
- Association for Medical Education in Europe (AMEE). 2008. Programme for annual meeting, Prague, Czech Republic. Available online at: URL=<http://www.amee.org/documents/AMEE%202008%20Final%20Abstract%20Book.pdf> (accessed 16 January 2009).
- Bracher L, Cantrell J, Wilkie K. 1998. The process of poster presentation: A valuable learning experience. *Med Teach* 20(6):552–557.
- Brownlie D. 2007. Towards effective poster presentations – An annotated bibliography. *Eur J Mark* 41(11/12):1245–1283.
- Chute DL, Bank B. 1983. Undergraduate seminars: The poster session solution. *Teach Psychol* 10(2):99–100.
- Costa MJ. 2001. Using the separation of poster handouts into sections to develop student skills. *Biochem Mol Biol Educ* 29(3):98–100.
- Ecological Society of America (ESA). 2008. 93rd ESA annual meeting, Milwaukee, WI, USA. Available online at: URL= <http://eco.confex.com/eco/2008/techprogram/> (accessed 16 January 2009).
- Hess G. 1999. 60-second poster evaluation. Available online at: URL= <http://www.ncsu.edu/project/posters/NewSite/60second.html> (accessed 17 January 2009).
- Hess G, Brooks E. 1998. The class poster conference as a teaching tool. *J Nat Resour Life Sci Educ* 27:155–158.
- Hess G, Tosney K, Liegel L. 2008. Creating effective poster presentations. Available online at: URL=<http://www.ncsu.edu/project/posters> (accessed 16 January 2009).
- Maugh II. TH. 1974. Poster sessions: A new look at scientific meetings. *Science* 184:1361.
- Moneyhan L, Ura D, Ellwood S, Bruno B. 1996. The poster presentation as an educational tool. *Nurse Educ* 21:45–47.
- Moule P, Judd M, Girod E. 1998. The poster presentation: What value to the teaching and assessment of research in pre- and post-registration nursing courses? *Nurse Educ Today* 18:237–242.
- Pelletier D. 1993. The focused use of posters for graduate education in the complex technological nursing environment. *Nurse Educ Today* 13(5):382–388.
- Smith PE, Fuller G, Dunstan F. 2004. Scoring posters at scientific meetings: First impressions count. *J R Soc Med* 97:340–341.