Assertion Evidence Structure
Presenting scientific ideas

Michael Alley's concept of using Assertion Evidence Structure[1] in presenting scientific ideas and material (dt: Aussage-Evidenz-Struktur) was developed in the early 1980s and is based on results in cognitive learning. Slides in presentations that use this structure start with succinct and clear assertion headlines that are backed up with visual evidence in the body of the slide. Associate Professor Michael Alley teaches Engineering Communications at Pennsylvania State University and has authored many books, including The Craft of Scientific Presentations. For more information on Michael Alley, contact him at mpa13@psu.edu or at his AES website: http://www.assertion-evidence.com/

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Have you also almost fallen asleep during a presentation that was made up of fairly boring slides full of too much text and bullet lists that were not motivating? That made learning almost impossible? Or that failed to make a point or even worse, failed to get the point across? Such presentations do not provide healthy learning environments that motivate us to understand and study the material, which is actually what we should be doing in lectures and seminars. Nor do they prepare students for their professional life.

Note
Please check out these other fact sheets also:
↗Learning Outcomes
↗Designing learning rooms
↗Formulating Exam tasks
↗Exam grading with the step-level model

Presentations without AES

What happens when we listen to a scientific lecture (or any lecture for that matter!) that does not have assertion evidence structure? In general, we are often overwhelmed with the amount of written information on the slides[2], which is also often – worst case scenario – simply read out loud to us. Let's look at an example of a typical outline slide for a scientific presentation:

A typical outline slide in an everyday teaching-learning-scenario that does not use assertion-evidence structure looks like this: The agenda for the session is stated as a boring and often hard to follow bullet list or outline instead of a concise, well-formulated assertion headline that not only introduces the topic, but also fosters independent thinking and sets the scene for the entire presentation or lecture. Many of the words in such lists are simply space fillers: „Introduction"; "„Background"; „Methods"; „Results"; etc. Each of those words could be replaced with a succinct assertion about the topic that states the main point of the actual slide. An example of a slide with only bullets and its transformed AES slide can be seen below in Fig. 1.
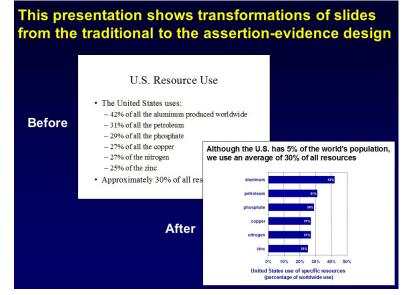

Fig. 1: AES: before and after slides

Creating presentations with AES

Presentations built on AES deliver key messages. Each slide has a left-justified, 2-line sentence headline that is backed up with visual evidence. The slides are not a series of slides with topics and sub-topics as bullet lists that are often too wordy and confusing. Studies in cognitive learning have shown that audiences retain input better when they do not have to follow written and spoken text at the same time[2]. Most people in the audience, when trying to process the written text on the slide while the presenter reads the same text out loud, overload their cognitive learning processes. Our brains go into overload when we try to follow text on a slide and listen to that same text being read out loud.

„At some point in my PhD, I got tired of giving the same kind of presentations every time. You know, those containing a lot of text and having generic slide titles like ‚Results' and ‚Conclusion'. I decided to learn a new way of communicating; ↗the assertion-evidence approach." (↗http://www.ntnutechzone.no/en/2017/02/science-presentations-they-are-a-changing/)

There is a slight drawback in using AES; it does take more time and effort to create concise and succinct assertion headlines than simple bullet lists. However, assertions that convey the key point of your slides are conducive to the audience remembering your point – a win-win situation for all involved. Furthermore, research has also shown[4] that students who present talks and material in presentations that are based on AES understand the material better than students who only develop talks with bullet lists of topics/sub-topics. In general, clear and concise sentence headlines can only be successfully written if the material is well-understood, i.e., if we think more about and better understand our subject matter. Moreover, revising the sentence headlines so that they comply with the 2-line limit forces us to focus on the precise message of the slides. If the meaning or message of the slide cannot be stated in two lines, perhaps the message is too complex and more than one slide is needed.

Finding the correct type of visual evidence to support the main message of the slide is very important, yet visually prepared data as graphs or flow-charts are necessary in most scientific research and thus are usually readily available. It is important to make sure that the visual evidence actually supports the key message that the slide is making; it cannot simply be colorful or nice to look at.

Three of the most important types of AES slides are the title, mapping, and concluding slides and the following section will discuss creating these slides.

AES title slides

It is especially important to start straight off with AES in your presentation – that means the title slide needs to use AES also to pick up your audience and let them know what is coming. Instead of a run-of-the-mill title slide remember to include an image on the title slide, perhaps even simply one from the presentation. Your title, date, and author data should be left-justified with the title at the top of the slide. And remember: Titles are also more meaningful if they are concise and succinct:
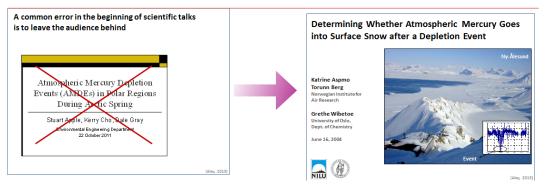

Fig. 2: Example title slides without AES (left) and with AES (right)[1]

AES mapping slides

Another very important AES slide is the so-called mapping slide, so named because it maps out where the presentation will go. Most mapping slides will start out with a variation of „This presentation will look at…" or „Today, I want to present…". Such 2-line, left-justified sentence headlines are much more effective for taking your audience on your journey with you than a bullet list of your topics and sub-topics.
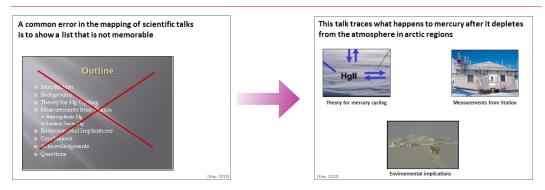

Fig. 3: Outline slide without AES (left) and AES mapping slide (right)[1]

AES concluding slides

The final slide of each presentation should summarize the most important message from the presentation so that your audience readily has the key take-away of the talk. Most concluding slides will start out with a variation of „In conclusion" or „To sum up …". Stating your conclusion and using visual evidence to support the conclusion along with parallel points helps the audience the understand and comprehend the conclusion better. Moreover, instead of using an entire, basically blank slide after your conclusion slide stating only „Thanks for your attention" or „Questions?", it is much more effective to simply let the phrase or word appear at the bottom of the slide when you are finished talking. Furthermore, letting „Questions?" appear on your final, concluding slide instead of turning to a blank slide allows the audience to stay focused on your most important slide during the question and answer period.
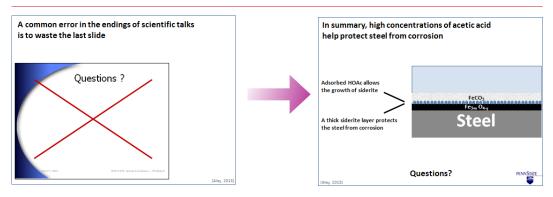

Fig 4: Final slide without AES (left) and an AES summerizing slide (right)[1]

It is very important to remember that AES sentence headlines should not be read out loud to the audience, but rather paraphrased, i.e., you should restate the meaning of the slide headline in different words. This not only can help clarify the meaning, paraphrasing also helps the audience stay with the key message of the slide and it also ensures that the audience can pay better attention because they are more able to discern the key input.

As mentioned before, creating presentations with assertion-evidence structure requires a bit more effort, but since that effort enables you to better understand the material, you will be able to present with more confidence. Especially because, in order to be able to paraphrase the headlines, you need to practice delivering the talk more than once in advance and practice makes perfect! Reading bullet lists might be easier, but it is much more boring for your audience. Use the AES presentation style instead to motivate your audience and make sure no one ever falls asleep at one of your presentations!

References

1 **Alley, M. (2013):** The Craft of Scientific Presentations, 2nd ed. (New York: Springer-Verlag, 2013).

2 **Garner, J. K., Alley, M., Gaudelli, A., Zappe, A. (2009):** The common use of PowerPoint versus the assertion–evidence structure: A cognitive psychology perspective. Technical Communication, 56 (4).

3 **Sweller, J. (2005):** Implications of cognitive load theory for multimedia learning. The Cambridge Handbook of Multimedia Learning, ed. by Richard A. Mayer. New York: Cambridge Press, pp. 19–30.

4 **Garner, J. K., Alley, M., Aippersbach, S. (2016):** International Journal of Engineering Education (vol. 32, no. 1(A), 2016), 2013 ASEE Annual Conference.