

Leading Discussion of a Scientific Journal Article

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Science departments at many universities convene regular discussions of contemporary research, journal articles, or even ideas or studies done by group participants. This forum thus provides an opportunity to evaluate embryonic or fully-fledged research results, to keep abreast of newly published ideas or books, and to develop or teach communication skills. Faculty benefit from exposure to hot, contemporary topics that they might not otherwise encounter (see list of topics as examples from [Spring 1998 Journal Review, Appendix](#) below), and students benefit from the opportunity to develop essential professional skills and to interact regularly with diverse faculty. These skills include critical thinking, critical evaluation of published work, effective writing and presentation, oral communication, and leading group discussions. Leading a discussion of a scientific work is a hybrid of several kinds of skills — leading a discussion group, reading a scientific paper at a meeting, public speaking — but it is different from all of these in interesting ways, which is why I have put together these comments (see [References](#) below).

The focus here is how to lead discussion of a scientific journal article, but our group maintains flexibility by inviting outside seminar speakers, discussing the research of group members, and taking on extended discussions of book-length works, among other activities.

Choice of Topic

The first task, and one of the most important ones, is to choose a good article or topic. The article should be significant and general enough to interest the entire group. For example, if both botanists and zoologists participate in the group, then an article on a process or phenomenon applicable to both animals and plants is better than one applicable just to plants. In other words, choose an article appropriate to the audience. The article should also encourage critical thinking and discussion, e.g., by broad enough applicability to pique interest of people with different backgrounds, or by providing a bold and provocative new syntheses. Multiple articles might be chosen, particularly if they present alternative views of a controversy, or otherwise invite comparison or contrast. Be sure to choose readings that are sufficiently inviting and concise that other members of the group will do the reading!

Preparation

The most important prerequisite to leading a successful discussion or giving a presentation is preparation. First, be sure that all members of the group have easy access to the readings well in advance of the meeting date. Then consider providing written instructions, e.g., what aspects or parts of readings to emphasize, or a series of questions. Focus any such questions or preparatory material on the key points or issues to be elucidated during the actual presentation.

Next, review the material, and supplementary material, so as to be sure to understand the content. Read the article multiple times, if necessary, to grasp the concepts and be familiar with content. Seek help with ideas you do not understand. Consult literature that is cited, or other material that will enhance understanding of the topic. Be sure to understand the basic operation of the system under consideration, even if it is necessary to consult texts, additional articles, or colleagues. Look for material or examples that help expand the applicability or generality of the ideas or system under consideration.

Finally, organize the presentation itself. Try alternative organization schemes (using outlines) in an

effort to improve on the logic and flow of the presentation. Provide visual aids to enhance understanding. For example an outline will help others follow the presentation, a set of open-ended questions will help provoke participation by group members and lead the group in the direction desired. Anticipate questions by the group, and prepare to answer them. Graphics (overheads, computer printout, tables, figures, etc.) should be concise, easy to grasp, and large enough to be read by anyone in the room. Models, diagrams, cartoons, and other material can also enhance understanding. Remember that "more is more" when it comes to preparation, and that "less is more" when it comes to presenting a lot of material at the expense of leading a discussion of the material! A discussion group should not be confused with a lecture! Also avoid repeating the material of the article because participants will want more from a discussion than they could have gotten by just reading the article on their own!

Try to keep the atmosphere light. Use humor if it comes easily to you. Cartoons, animated drawings, or simple illustrations created by the discussion leader to make or clarify a point can be very effective — and memorable.

Presentation

Introduce the topic with reference to the general conceptual context, but plan to keep the introduction very brief, because you will want to reserve the bulk of the time for discussion. Try to see the forest for the trees, in providing background information, for example by thinking about where the topic might fit in an introductory textbook on the topic. This also helps establish the importance of the topic. Avoid the common mistake of giving too much background: You do not have to go back to Darwin for every talk on the subject of Evolution. Again, think of your group and its needs when deciding how much background or explanatory information to provide. You may have to give handouts or an introductory presentation on technically difficult material necessary for full comprehension of the topic. Illustrations of the organisms involved, the study system, and the experimental or conceptual set-up are often useful, even if these are not described in much detail in the work you are discussing.

Review key methods, findings, and interpretations, using simple illustrations (figures and tables — consider simplifying them for ease of comprehension by the group). Provide perspective by giving some history underlying the work, by discussing its scope or applicability, and by asking what are the advances (e.g., technical, conceptual, or analytical). Invite criticism of too much generalization or "over analysis", incorrect interpretation, inappropriate design or statistical analysis, lack of consideration of alternative plausible hypotheses, untested (and unidentified) assumptions, and so on. The criticism will be more useful if it is constructive, i.e., designed to identify improvements or avenues for future, clarifying studies. You as the discussion leader may wish to suggest for consideration your own novel interpretations, deductions, or syntheses.

Be prepared to lead the discussion by asking questions. You may want to start out with yes-no questions to get opinions defined, and get started. Then you can ask more open-ended questions, such as why? How? Which? Consider having a list of questions that invites the group to participate, and that helps lead the group towards the core issues for consideration. Questions can also establish the objectives and scope of the discussion, and can complement an outline of the discussion. Consider dealing with the core issues first, because this guarantees that the most important issues will get discussed, leaving less important ones for any remaining time. Again, remember that a discussion is just that, and the job of the discussion leader is to invite participation by other members of the group. Unless another member of the group decides to get the discussion rolling for you, you will have to do so with your own questions or provocative statements.

Speaking Effectiveness

Speak clearly, towards group participants, and slowly enough to be understood. Try to maintain eye contact with group members, which establishes rapport, comfort, and feedback on whether or not group members are following the speaker. Seek a speaking pace that favors comprehension. Leading a group discussion involves some of the same skills as public speaking, and many books and courses are available on the latter topic (e.g., Reeve 1992).

Nervousness can affect how one speaks, and most presenters feel it, particularly inexperienced students. However, many relaxation (a.k.a. stress-reduction) techniques are available to help relieve the nervousness, such as deep breathing and positive visualization — e.g., visualizing yourself handling the situation successfully. One of the best defenses is a strong offense, namely preparation, which tends to provide the confidence that can also help relax a speaker. Recognizing one's own nervousness is the first step in learning techniques to overcome it. Practice can't hurt, either, particularly in terms of speaking, presenting background information, and timing the presentation of material (computer software packages such as Microsoft PowerPoint help make this task easier for some kinds of presentations).

Leading a Discussion

Coming prepared with a list of provocative questions is an excellent way to get a discussion going. Keep the discussion moving actively, by avoiding digressions, and returning the discussion to the topic at hand, if necessary. The discussion leader is in charge, and should feel comfortable taking charge, if necessary. Use silence effectively, and resist the temptation to answer your own questions after too little time, which has the effect of taking the discussion away from other participants — who will want to participate themselves, no doubt. Encourage speaking up by other participants, so all can hear, and encourage other participants to clarify or elaborate. Protect the rights and respect of other speakers, for example by respecting their opinions, or risk inhibiting their willingness to participate. Focus any dissension on issues rather than participants. Differences of opinion should be encouraged, and can certainly make any discussion more lively and memorable. Use disagreements to encourage critical, independent thinking. Test information for reliability. For example, is it relevant (how does it apply?), is it valid (what's the source of information), and is it credible (is there contradictory information or interpretation)? Help with clarity, e.g., by reviewing your own understanding or asking others to clarify issues.

Watch out for non-constructive "contributions" (Reeve 1992). For example, there's the "talk hog" who goes on and on, to everyone else's disappointment. To deal with this type, slide into the discussion during a breath or break in thought, acknowledge their contribution, and ask the rest of the group for a response. The "attention getter" can be handled by structuring the talk so that other members of the group get equal time to give their own views. One can encourage a "wallflower" by asking for contributions from other participants.

Look for closure and summarization, both as you are moving along, and at the end of the discussion. Encourage participants to provide summary. Use clear transitions both to keep the discussion moving and to provide closure on issues that are already adequately considered. Allow time at the end to seek consensus, conclusions, and/or assessment, and encourage members of the group to participate in providing closure.