

TABLE 6.2 Standard evaluation criteria for reviewing a research paper (see also Rangachari and Mierson, 1995; Seals and Tanaka, 2000).

<p>Introduction</p>	<p>Have the authors clearly established a context for their work by identifying what is known and what is unknown about their topic area?</p> <p>Do the authors identify clearly which gap in knowledge they are addressing?</p> <p>Do the authors identify clearly the research questions they are investigating and why it is important to study these questions?</p> <p>Is the proposed work novel?</p>
<p>Materials and methods</p>	<p>Is the experimental strategy utilized the strongest test of the research questions posed or is there an alternative strategy that could be used that would be more appropriate for answering the research questions?</p> <p>Are the experimental methods described in sufficient detail to allow another scientist to repeat the work or at least to evaluate the quality of the findings?</p> <p>Does the experimental strategy control for confounding factors? To answer this question you will need to consider the following:</p> <p>Have the authors used appropriate positive and negative controls?</p> <p>Have the authors used appropriate number of replicates (i.e. sample size)?</p> <p>Have the authors used appropriate sample selection methods?</p> <p>Have the authors used appropriate methods when assigning samples to treatments?</p> <p>Has the experiment been repeated a sufficient number of times? Is each experiment repeated independently of each other?</p> <p>How appropriate are the techniques used for collating the data? Here you will need to consider the level of accuracy and precision of the measuring equipment used to acquire the data. To do this competently you need to understand the theory underlying the experimental technique and limitations of that particular technique. You also need to consider whether there</p>

	<p>are alternative methods that could produce more precise results and if more than one technique should be used to corroborate the findings</p> <p>How have the data been analysed? Is this the most appropriate way? If any statistical tests are used, are they the most appropriate? If statistical tests have not been used, should they have been?</p>
<p>Results</p>	<p>Have the authors presented replicate data? If yes, how similar are the repeated results? Here you will need to look at the standard deviations or standards errors (if reported) for each data point and compare the variability in results across the different conditions</p> <p>Have the control data been presented? Are the control data clearly differentiated from the experimental data?</p> <p>Have the authors described their findings accurately? Here you should look at the actual data presented rather than reading the authors' account of the differences in the data</p> <p>If any mathematical calculations have been performed (e.g. p-values) have these been calculated and interpreted appropriately?</p> <p>Are the tables and figures presented clearly so that the reader can assess the results in relation to the stated aims of the study?</p>
<p>Discussion</p>	<p>Have the authors met the aims of the study that they set out in the Introduction?</p> <p>Are all the conclusions made by the authors adequately supported by the results presented?</p> <p>Is there any alternative explanation for the data presented that the authors have not considered?</p> <p>Do the authors clearly differentiate between fact and speculation?</p> <p>Do the authors speculate excessively?</p> <p>Do the authors discuss their findings in the context of published</p>

	<p>literature (i.e. studies that support their conclusions as well as those that conflict with their conclusions)?</p> <p>Is there any further information (i.e. additional experiments) required to strengthen the claims being made by the authors?</p> <p>From the discussion is it apparent that the study has addressed a significant gap in our understanding of the problem under investigation?</p>
Additional questions	<p>Are the references accurately reported?</p> <p>Are all the references necessary to understanding the work?</p> <p>Have the authors omitted any significant papers?</p> <p>Are the references sufficiently up to date?</p> <p>Are you satisfied that any disclosed conflicts of interest have not influenced the interpretation of the results?</p> <p>Are you satisfied that the experiments have been conducted in accordance with ethical regulations and requirements (if appropriate)?</p> <p>Is the paper well written and comprehensible to the reader?</p> <p>Does the abstract concisely and accurately summarize the content of the paper without the reader having to refer to the main article?</p>
