Academic Writing Workshop

Janet L. Kayfetz

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<u>ACADEMIC WRITING WORKSHOP</u>

The *Academic Writing Workshop* will focus on the fundamentals of excellent academic writing. In addition to the central idea of rhetorical positioning, we will discuss the construction of logical arguments, strength of claim in the reporting of data, reader-oriented writing, clarity, precision in word choice, grammatical usage, and editing strategies. We will also focus on developing writing fluency through in-class practice with timed, unedited journal writing. Students in the course will work on a variety of texts including bio-data statements, abstracts, introductions, data commentaries, results commentaries, and conclusions. A special feature of the coursework is the analysis and editing of student writing-in-progress. We will look at student texts during each class session through peer-editing as well as class editing sessions. All students will receive detailed feedback on their writing during class sessions as well as through individual conferences with Janet throughout the 5 week workshop. Students are encouraged to focus on their writing-in-progress if they are working on a paper or thesis. Students not currently working on a paper or thesis will be asked to produce samples of new text for the workshop.

The *Academic Writing Workshop* will meet twice a week in two-hour sessions for five weeks. Students who sign up for a workshop will be required to attend all sessions. If you must miss a session, feel free to attend the other writing workshop section.

Section 1 - M/W 11am-1pm   477 CSB - Open Meeting Area
Section 2 - T/H   11am-1pm   477 CSB - Open Meeting Area

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Writing texts I recommend -

1. <u>Academic Writing for Graduate Students - Essential Tasks and Skills</u>. Second Edition. John M. Swales and Christine B. Feak. 2004. The U. of Michigan Press.

2. <u>The Elements of Style</u>. Fourth Edition. William Strunk Jr. and E.B. White. 2000. Longman.

3. <u>On Writing Well</u>. 30th Anniversary Edition. William Zinsser. 2006.

4. <u>Writing for Computer Science</u>. Second Edition. Justin Zobel. 2004.

<u>Engineering Communication - A Practical Guide to Workplace Communications for Engineers</u>. David Ingre. 2008. Thomson.

<u>Nelson Pocket Book of Technical Writing for Engineers and Scientists</u>. Third Edition. Leo Finkelstein, Jr. 2008. McGraw Hill.

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A NOTE OF THANKS: Much of the information contained in this workshop packet comes directly from sections of John Swales and Christine Feak - **<u>Academic Writing for Graduate Students - Essential Tasks and Skills</u>.** Second Edition. 2004. The University of Michigan Press. In some cases I quote directly; in other cases I paraphrase and edit for our workshop purposes. JLK

ACADEMIC WRITING WORKSHOP – Definitions

- The story – leading into your ideas; narrowing the space; logical development; layers of specific examples; facts v. interpretation

- Form - organization of the ideas; genre; balance; grammar and usage

- Language - readability; precision; clarity; beauty

- The rhetorical approach to writing and positioning

    •audience

    •purpose

    •organization

    •style

    •flow

    •presentation

- Two important approaches to internal organization in academic writing

    •Moving from general to specific

    •Moving from problem to solution

<u>Introductions</u> (Swales and Feak)

"Writing the Introduction to a research paper for a wide audience is a challenge. The author must theoretically attract an audience of readers. While a direct opening in an Introduction (Like "The purpose of this paper is . . ." or "This paper describes and analyzes. . .") may appeal immediately to researchers actively involved in the particular research area, it may "turn off" many other readers who have no direct interest in the topic.

Just as plants compete for light and space, so writers of research papers compete for acceptance and recognition. In order to obtain this acceptance and recognition, many writers will use a rhetorical organizational pattern called *Creating a Research Space* (CARS) (Swales and Feak, 2004). Writers follow this organizational pattern in response to two kinds of competition: 1) competition for research space and 2) competition for readers. In this Introduction pattern, the work of others and/or what is known about the world is primary, and your own work is secondary. This background-foreground relationship is reversed in Discussions."

The CARS model describes three "moves."

<u>Moves in Research Paper Introductions</u>

Move 1 - Establishing a research territory
a. by showing that the general research area is important, central, interesting, problematic, or relevant in some way
b. by introducing and reviewing items of previous research in the area

Move 2 - Establishing a niche*
      (* In ecology, a niche is a particular microenvironment where a particular organism can thrive. In our case, a niche is a context where a particular piece of research makes particularly good sense.)
a. by indicating a gap in the previous research, raising a question about it, or extending previous knowledge in some way

Move 3 - Occupying the niche
a. by outlining purposes or stating the nature of the present research
b. by listing research questions or hypotheses
c. by announcing principal findings
d. by stating the value of the present research
e. by indicating the structure of the research paper

Introductions - CARS Move 1a – Establishing a research territory by claiming centrality

Here are two opening sentences from an aerospace research paper that uses the "claiming centrality" rhetorical pattern in Move 1a:

The increasing interest in high angle-of-attack aerodynamics *has heightened the need* for computational tools suitable to predict the flowfield and aerodynamic coefficients in this regime. *Of particular interest and complexity are* the symmetric and asymmetric separated vortex flows which develop about slender bodies as the angle of attack is increased. (Almosnino, 1985) (S&F 250)

The following are strong opening statements used to "claim centrality."
*The increasing interest in _____ has heightened the need for _____
*Recently, there has been growing interest in _____
*The possibility of _____ has generated wide interest in _____
*The development of _____ is a classic problem in _____
*The study of _____ has become an important aspect of _____
*A central issue in _____ is _____
*The _____ has been extensively studied in recent years.
*The relationship between _____ and _____has been investigated by many researchers.
*Many recent studies have focused on _____

Introductions - CARS Move 1b -Establishing a research territory by reviewing the literature

There are two major theories about the role and purpose of citations in academic texts:
• Citations are used to recognize and acknowledge the intellectual property rights of authors. They are a matter of ethics and a defense against plagiarism.
• Citations are used to show respect to previous scholars. They recognize the history of the field by acknowledging previous achievements.

Look at these examples of different types of citations and tense used in academic writing. The differences among these tenses are subtle. In general, moves from *past tense* to *present perfect tense* and then to *present tense* indicate that the research reported is increasingly close to the writer in some way: close to the writer's own opinion, or close to the writer's own research, or close to the current state of knowledge.

1.   Reference to single studies (*past tense*)
        Jones (1997) *investigated* the causes of illiteracy.
        The causes of illiteracy *were investigated* by Jones (1997).
(This type of citation makes reference to what researchers *did, investigated, studied, analyzed, thought, stated, concluded, claimed*.)
2.   Reference to areas of inquiry (*present perfect tense*)
        The causes of illiteracy *have been* widely *investigated* (Jones 1977, Ferrara 2000, Hyon 2004).
        There *have been* several investigations into the causes of illiteracy (Jones 1997, Ferrara 2000, Hyon 2004).
3.   Reference to state of current knowledge (*present tense*)
        The causes of illiteracy *are* complex (Jones 1997, Ferrara 2000, Hyon 2004).
        Illiteracy *appears to have* a complex set of causes (Jones 1997, Ferrara 2000, Hyon 2004).
        According to Jones (1997), illiteracy *appears to have* a complex set of causes.
        Smith's research shows. . . (Smith 2008)

More examples –

Weaker   Jones (1997) found that illiteracy *was* correlated most closely with poverty.
Stronger   Jones (1997) found that illiteracy *is* correlated most closely with poverty.

The first sentence shows that the writer believes the finding should be understood within the context of the single study. In the second sentence, the writer implies that a wider generalization is possible.

<u>Introductions - CARS Move 2 -Establishing a niche by indicating a gap in the previous research</u>

Swales – "In many ways, Move 2 is the key move in Introductions to longer research papers. Move 2 is the hinge that connects Move 1 (what has been done) to Move 3 (what the present research is about). Move 2 thus establishes the motivation for the study. By the end of Move 2, the reader should have a good idea of what is going to come in Move 3."

Most Move 2s establish a niche by indicating a gap – by showing that the research story so far is not yet complete. Move 2s, then, function as *mini-critiques.* Usually Move 2s are quite short, often consisting of no more than a sentence. Examples –

1. Apart from a chapter in Foster (1997), this series *has been little discussed by critics or art historians.* For example, these pictures *were ignored by Johns* in . . .
2. *Little is known,* however, *about participants' views of* university-community collaborations.
3. *Previous research has not addressed . . .*
4. *Moreover, research has not fully considered. . . Nor has it addressed . . .*

Following are "negative" verbs and adjectives that tend to cluster in Move 2.

<u>Verbs</u>
However, previous research in this field has _____ _x_.

concentrated on	neglected to consider
disregarded	overestimated
failed to consider	overlooked
ignored	been restricted to
been limited to	suffered from
misinterpreted	underestimated

<u>Adjectives</u>
Nevertheless, these attempts to establish a link between dental fillings and disease are at present _____.

controversial	questionable
incomplete	unconvincing
inconclusive	unsatisfactory
misguided	inadequate

Not all Introductions express Move 2 by indicating an obvious gap. You may prefer to avoid negative comment. In such cases, a useful alternative is to use a contrastive statement.

Examples –

1. The research has tended to focus on . . . , rather than on . . .
2. These studies have emphasized . . ., as opposed to . . .
3. Although considerable research has been devoted to . . . , less attention has been paid to . . .

Introductions - CARS Move 2 -Establishing a niche by raising a question, a hypothesis, or a need

1. *However*, it remains unclear whether. . .
2. The findings suggest that this approach might be less effective when . . .
3. It would seem, therefore, that further investigations are needed in order to . . .

Introductions - CARS Move 2 -Establishing a niche by extending previous knowledge

1. These recent developments in computer-aided design clearly have considerable potential. In this paper, we demonstrate. . .
2. The literature shows that Rasch Analysis is a useful technique for validating multiple –choice tests. This paper uses Rasch Analysis to . . .
3. Such active-R networks eliminate the need for any external passive reactance elements. This paper utilizes the active-R approach for the design of a circuit . . .

Introductions - CARS Move 3 – Occupying the niche

The third and final step in the typical Introduction is to make an offer to fill the gap that has been created in Move 2. Move 3 is typically signaled by a reference to the present text, such as the use of *this*, *the present, reported,* and *here.* It is also common in some fields for authors to switch from the impersonal to the personal by using *we* or more rarely, *I*. ("In this paper, *we* present the results of three experiments.") The two main variants of Move 3 are:

Move 3a - The author indicates her main purpose or purposes.
        The aim of *the present* paper is to give . . .
        The main purpose of the experiment reported *here* is/was to . . .
        The aim of *this* investigation was to test . . .
        Our primary objective in this paper is to provide . . .

Move 3a - The author describes the main feature of her research.
        This paper *reports* on the results obtained . . .
        In this paper we give preliminary results for . . .
        The *present* work extends the use of the last model by . . .
        We *report* the interaction between . . .
        The primary focus of *this* paper is on . . .

NOTE: If you choose to refer to the work in your text ("The aim of this paper is to give . . ."), you must use the present tense. If you write "The aim of this paper was to give . . .," it suggests that you are referring to an original aim that has now changed.

Completing an introduction

Sometimes a second sentence is necessary to complete Move 3a. For example -

The present work extends the use of the last model to asymmetric, body-vortex cases, thus increasing the range of flow patterns that can be investigated. *In addition, an effort is made to improve the numerical procedure to accelerate the convergence of the iterative solution and to get a better rollup of the vortex lines representing the wake.* (Swales)

Second statements are often introduced in the following ways:
In addition, . . .   Additionally, . . .
A secondary aim . . .   A further reason for . . .

Introductions - CARS Move 3c - Announcing principal findings

There is some confusion as to whether Introductions should close with a statement of the principal results. Swales and Najjar (1987) found that physicists close Introductions with findings about half the time, but educational researchers hardly ever include such statements. If there is an abstract, do you need to give the main findings three times: in the abstract, in the introduction, and in the results? It is best to follow the standard practice in your field.

Introductions - CARS Move 3e - Indicating the structure of the paper

"The plan of this paper is as follows. Section II describes the current arrangements for regulating exchange rates within the EC. In Section III a theoretical model is constructed which is designed to capture these arrangements. Experimental parameters are then tested in Section IV. Finally, Section V offers some suggestions for the modification of the current mechanisms."

Data Commentary (From Swales and Feak)

"Data commentaries are exercises in positioning yourself. There are, as a result, both dangers and opportunities. One danger is to simply repeat in words what the data have expressed in nonverbal form – in other words, to offer description rather than commentary. An opposite danger is to read too much into the data and draw unjustified conclusions. The art of the matter is to find the right *strength of claim* for the data and then order your statements in some appropriate way (such as from the more significant to the less significant). In most cases, this means moving in a general to specific direction."

Language example: Put the sentence variations in order from 1 (strongest claim) to 6 (weakest claim).

Deregulation of the U.S. banking industry _____the 1989-91 banking crisis.
____a. contributed to
____b. caused
____c. may have contributed to
____d. was probably a major cause of
____e. was one of the causes of
____f. might have been a small factor in

Typically, a data commentary will include more than one of the following elements. The commentary will

• Highlight the results.

• Assess standard theory, common beliefs, or general practice in light of the given data.

• Compare and evaluate different data sets.

• Assess the reliability of the data in terms of the methodology that produced it.

• Discuss the implications of the data.

Data Commentary – From UCSB Professor Tim Sherwood

Your paper is the story of the work that you have completed. After setting the background for your story, the data you present is the tool to get your core ideas across to the reviewer and the reader. It is important to be as clear as you can be in your data presentation -- if you were to look at the graphs and figures isolated from the text, these figures and their captions should clearly reveal your story to the reader.

WALTER as is a handy way to think about presenting a visual. Try to include all of the WALTER elements in each description of a graph or figure.

W - Why	Before you even describe the figure, you need to set up the context. Sentences such as "To understand how our technique scales under heavy loads we ..." or "As performance is critical to the usability of our system we ..." set up the expectations for the figure. The reader needs to understand what new insight they should be hoping to discover by bothering to try and understand your graph. None of this is obvious to the reader. This is the most important part of describing a graph.
A - Axis	The axes frame the results of the graph and are an opportunity to precisely describe the parameters of your experiment. Example: "We varied N, the number of virtual machines running our improved memory manager, from 1 to 64 as shown on the x-axis" Example 2: "The y-axis shows the average power consumed by the devices as measured in Watts". All axes should have units, and complex metrics or units should be fully motivated and described. If the axis shows a ratio (such as speedup) it needs to be clearly indicated if this ratio is presented as a fraction or percentage. (I have reviewed papers where people say "the performance improvement is 1.2." -- is that 1.2% or 1.2x?)
L - Lines	Oftentimes we need to show several experiments on the same graph so that the results can be compared directly. Here "Lines" could be referring to lines on a multi-line graph or the different types of bars in a bar chart. The point is to make sure that each of these is clearly described. Example: "The solid black line shows the performance of the baseline system described in Section 1.2, while the dashed grey line shows system performance after our optimization is applied". Example 2: "The solid grey portion of the bar shows the fraction of users that indicated they were satisfied the user experience, while dissatisfied users are shown in black". Keep in mind that most publications are black and white only (there are exceptions), and that most reviewers print out the papers on non-color printers. Avoid colors that look the same when printed in greyscale (or avoid color altogether).

T - Trends	Now that you have the stage properly set, including the motivation (the Why), parameters (the Axes), and types of data points (the Lines), you can begin to discuss the overall trends of the graph. This is the main point that you want people to take away from the reading this graph -- do not assume it is obvious. Example: "Looking across all of the applications we can see that in most cases an 8% to 10% reduction in memory footprint is achieved".
E - Exceptions/Anomalies	In most graphs of experimental data there are some outliers and exceptions. Your readers will notice them. Don't try to hide them (you are a scientist after all), but do try to explain them. Example 1: "While we achieve near linear scaling up to 64 processors, there is a short performance dip at 16 processors where the data structures can no longer be completely memory resident". Example 2: "The only program for which this technique actually hurts performance is gcc. The complex control dependencies of that program are large enough that they overflow the small buffer in our design". The exceptions section can be made even stronger by including evidence that your theory behind these exceptions is true. Continuing Example 2: "If the buffer size is doubled for gcc, the overall speedup jumps to 5%".
R - Recap/Segue	Finally, now that the graph is described, describe why these results are significant and segue on to the next result. Example: "As can be seen, even after simple optimizations are applied a very large fraction of the execution time is being spent in memory copy. In the next section we evaluate a novel copy free implementation that eliminates more than 70% of this overhead". Example 2: "Now that we have demonstrated the stability of our routing scheme in the face of errors, we need to examine the performance of the algorithm across those same topologies." As you can see for this example, this comment can overlap with the "Why" of the next data commentary.

<NOTE: Professor Sherwood makes a distinction between figures which help describe concepts and graphs which describe experiments and results. "I am _really_ picky about the way the figures and graphs look. They need to look clean and interesting -- two goals that are a bit at odds."   >

Captions – A caption can be a mini paragraph. A caption's power is that it is located right at the context where it is important. Give a one sentence summary of the point of the graph - What does the figure show? What conclusion should we draw from this figure? Professor Sherwood describes the axes in detail in the captions. Note – Do not say the same thing in the caption that you write in the text.

Example of a good data commentary from Professor Sherwood -

"This paper has a really solid data commentary, a mix of theoretical and experimental work, many examples of different types of graphs, an interesting technique now used by several different companies, and in fact won a best paper at CGO in 2006."

Shashidhar Mysore, Banit Agrawal, Timothy Sherwood, Nisheeth Shrivastava, and Subhash Suri.
 Profiling over Adaptive Ranges. Proceedings of the International Symposium on Code Generation and Optimization (CGO'06) March 2006. New York, New York.

http://www.cs.ucsb.edu/~sherwood/pubs/ProfilingAdaptiveRanges.pdf

<u>Data Commentary</u> continued (Swales and Feak) -

<u>Indicative Summary</u> - Indicates what has been done in the work.

•Table 5 shows the most common modes of computer infection for U.S. businesses.
•Figure 4.2 gives the results of the second experiment.

<u>Informative Summary</u> - Provides a summary of the data.

•Table 5 shows that home disks are the major source of computer viruses.
•Table 4.2 suggests that the experimental results confirm the hypothesis.

<u>Active voice:</u>

a. Table 5 **shows**   the most common modes of computer infections.
b. Table 2 **provides**   details of the fertilizer used.
c. Figure 4.2 **gives**   the results of the second experiment.

<u>Passive voice:</u>

a. The most common modes of infection   **are shown** in Table 5.
b. Details of the fertilizers used   **are provided** in Table 2.
c. The results of the second experiment   **are given** in Figure 4.2.

<u>Active Verbs Following Reference to a Visual</u>

Shows
Presents
Illustrates
Summarizes
Demonstrates
Contains
Provides
Depicts
Lists
Reports

<u>Passive Verbs in Reference to a Visual</u>

Shown in
Illustrated in
Presented in
Given in
Listed in
Seen in
Provided in
Summarized in
Seen from

Results Sections (Swales and Feak)

Research shows that the distinction between Results and Discussion is not as sharp as commonly believed. Authors often include commentary in the results section because they are aware of their audience. They can *anticipate* that their readers may be thinking, "Why did they use this method rather than that one?" or "Isn't this result rather strange?" For obvious reasons, authors may not want to postpone responding to such imaginary questions and critical comments until the final section of the paper.

As with Data Commentary, it is important to highlight key findings from the data and to judge the right *strength of claim*. he specifics of the investigation and methodology will determine subsection headings, if any."

Commentary Found in Results Sections from 20 published biochemistry papers (Thompson 1993)

Justifying the methodology	19/20 papers
Interpreting the results	19
Citing agreement with previous studies	11
Commenting on the data	10
Admitting difficulties in interpretation	8
Pointing out discrepancies	4
Calling for further research	0

Types of Results sections

Type 1 - Gives straightforward description of the author's results; includes no commentary at all (no comparisons with the work of others, no justifications).
Type 2 - Is mostly restricted to present findings, but includes a few minor uses of commentary.
Type 3 - Consists of both description of findings and a number of commentary elements; uses several of the categories mentioned by Thompson.
Type 4 - Makes heavy use of commentary; uses most of the categories found by Thompson; could almost be taken for a discussion.

Discussion/Conclusions (Swales and Feak)

By the time readers reach the discussion, authors can assume a fair amount of shared knowledge. They can assume (if not always correctly) that the reader has understood the purpose of the study, obtained a sense of the methodology, and followed along with the results. Authors can use this understanding to pick and choose what to concentrate on in the discussion. As a result, they typically have greater freedom and flexibility than in the introduction.

Discussions should be more than summaries. They should go beyond the results.
Discussions should be –
more theoretical – or

more abstract - or

more general - or

more integrated with the field - or

more connected to the real world - or

more concerned with implications or applications.

- and, if possible, discussions should be some combination of the above.

Moves in Discussions/Conclusions

Move 1 - Points to consolidate your research space
Move 2 - Points to indicate the limitations of your study
Move 3 - Points to identify useful areas of further research

      Many discussion/conclusion sections run through the Move 1 - Move 2 - Move 3 sequence more than once. Commonly, each cycle occupies one paragraph. If you write a fairly long discussion, begin with specifics and then move toward the more general.

Discussions/Conclusions - Move 2 – Points to indicate the limitations of your study

      Why would authors build up something in order to apparently attack it later? By using positioning, authors can present themselves very effectively by both
      1. highlighting intelligently the strengths of the study -and-
      2. highlighting intelligently its weaknesses.

      Discussion Move 2s tend not to use much negative language. The main reason is obvious - it is your own research that you are talking about. Another reason is that many limitation statements in Discussions/Conclusions are not so much about the weaknesses in the research, as about *what cannot be concluded* from the study. Producing statements of this kind provides an excellent opportunity for the writer to show that he or she understands how evidence needs to be evaluated in the particular field.

1. Limitations of research scope

•It should be noted that this study has been primarily concerned with . . .
•This analysis has concentrated on . . .
•The findings of this study are restricted to . .
•This study has addressed only the question of . . .
•The limitations of this study are clear. . .
•We would like to point out that we have not . . .

2. Limitations in conclusions

•However, the findings do not imply . . .
•The results of this study cannot be taken as evidence for . . .
•Unfortunately, we are unable to determine from this data . . .

3. Other expressions

•Notwithstanding its limitations, this study does suggest . . .
•Despite its preliminary character, the research reported here would seem to indicate . . .
•However exploratory, this study may offer some insight into . . .

Abstracts from Writing for Computer Science (J. Zobel - 144)

An abstract is typically a single paragraph of about 50 to 200 words. The function of an abstract is to allow readers to judge whether or not the paper is of relevance to them. It should therefore be a concise summary of the paper's aims, scope, and conclusions. There is no space for unnecessary text; an abstract should be kept to as few words as possible while remaining clear and informative. Irrelevances, such as minor details or a description of the structure of the paper, are inappropriate, as are acronyms, abbreviations, and mathematics. Sentences such as "We review relevant literature" should be omitted.

The more specific an abstract is, the more interesting it is likely to be. Instead of writing "space requirements can be significantly reduced", write "space requirements can be reduced by 60%." Instead of writing "we have a new inversion algorithm", write "we have a new inversion algorithm based on move-to-front lists."

Many scientists browse research papers outside their area of expertise. You should not assume that all likely readers will be specialists in the topic of their paper – abstracts should be self-contained and written for as broad a readership as possible. Only in rare circumstances should an abstract cite another paper.

Formal Style - The Vocabulary Shift

A distinctive feature of academic writing style is the choice of the more formal alternative when selecting a verb, noun, or other word. Shifting from a less formal word to a more formal word is a concrete way to maintain an academic tone in your text.

One of the most dramatic stylistic shifts from informal to formal style is the choice of a single verb over a verb + preposition. Often in lectures and everyday speech, the verb + preposition is used. To project a written academic style, writers should try to use a single verb wherever possible.

Examples -
Less formal style -   According to some biologists, *coming up with* clear proof of the decreasing
                      number of frogs has been difficult. ----→
More formal style -   According to some biologists, *offering* clear proof of the decreasing number of
                      frogs has been difficult . (Academic style)

Less formal style -   Researchers looked at the way strain builds up around a fault. --->
More formal style -   Researchers OBSERVED the way strain ACCUMULATES around a fault.
                      (Academic style)

Verbs		Nouns and other stuff	
figure out/	determine what is lacking	good/	considerable (progress)
help out/	assist	a lot of/	numerous
set up/	establish	pretty good/	encouraging (results)
go up/	increase	do not have enough/	have insufficient
go down/	decrease	sort of/	quite
cut down/	reduce	made bigger /	enlarged
get rid of/	eliminate	make it easier/	to facilitate
look into/	investigate		
do over/	repeat		
get/	obtain (results)		
look over/	review applications		
come up with/	develop hybrid vehicles that use a fuel-cell engine		
make up/	constitute a major part of the diet of these people		

<u>Grammar and formal writing style</u>

Below are a few non-vocabulary related recommendations for maintaining a scholarly and objective tone in your writing.

1. Avoid contractions.
X <u>won't</u> improve until the economy is stronger. -->
X <u>WILL NOT</u> improve until the economy is stronger.

  2. Use formal negative forms.
The analysis <u>did not</u> yield any new results. -->
The analysis <u>YIELDED</u> no new results.

3. Limit the use of "run on" expressions.
These semiconductors can be used in robots, CD players, <u>etc.</u> -->
These semiconductors can be used in robots, CD players, <u>AND OTHER ELECTRONIC DEVICES</u>.

4. Avoid addressing the reader as "you," except in a textbook.
<u>You can see</u> the results in Table 1. -->
The results <u>CAN BE SEEN</u> in Table 1.

5. Place adverbs within the verb rather than in the initial or final position.
<u>Then</u> the solution can be discarded. -->
The solution <u>can THEN</u> be discarded.

The blood is withdrawn <u>slowly</u>. -->
The blood is <u>SLOWLY</u> withdrawn.

Actually, very little is known about the general nature and prevalence of scientific dishonesty. →
Very little is actually known about the general nature and prevalence of scientific dishonesty.

This model was developed by Krugman (1979) originally. →
This model was originally developed by Krugman (1979).

6. Aim for an efficient use of words.
There are some inorganic materials that can be used by bioengineers in the process of tissue engineering that have been shown to be very promising. →
Some inorganic materials used in tissue engineering have shown great promise.

7. *I* and *We*
Check to see what is done in your field. The use of *I* or *we* does not necessarily make a piece of writing informal. The vocabulary shift and some of the other features listed above are more important for maintaining a consistent academic style.

<u>Some advanced writing concepts</u>

*<u>Constructing arguments</u> – Look at key sentences

It is important to draw attention to the difference between your own thought processes (writer-based) and the goal of shaping a clear and convincing argument for your audience (reader-based). Your argument may seem complete to you as you are composing, but may have holes in it from the perspective of the reader. Some of the problems for the reader may be that you have left one or more premises unstated, you have not supported your position, there is redundancy in the argument, or the logical order of the argument is weak and confusing. It is obviously important to present a strong argument to your readers, and the writing group can help you hear and understand your premises, claims, and conclusions so that you can make adjustments to the argument's structure if needed. Who is pushing your argument forward – the researchers you cite, or your own well-supported argument? Look at the first sentence of each paragraph in a section of your paper and see if you can follow the development of the argument throughout that portion of your text.

* <u>Voice</u> – Request reader feedback

When we talk about voice, we are talking about tone and style, very subtle but powerful components of any text. Often a writer has mastered the syntax and other surface forms in the language but is not able to maintain a consistent tone through a long text. Uneven tone can usually be traced to issues of register, the degree of formality of the language used, as well as the degree of personalization that the author has created in the text. Reading the text aloud to someone can often reveal places in the writing where there is choppiness or awkwardness.

*<u>Rhythm</u> – Read your text aloud to yourself

The rhythm in a text is the element that subtly pulls the reader through the story. Details like text inside parentheses or the use of many commas work to slow the rhythm for the reader, and can even stall your argument. How do you know if the rhythm of your text is smooth and helpful to your goal? Read your text aloud! You will feel the places that need your help. Perhaps there are too many short sentences that might be combined in some way or even edited out. Perhaps there is a sentence that is too long in the context and requires restructuring. Or perhaps you might need to combine two or three short sentences into one longer one. Keep playing with the rhythm (and reading aloud) until the text is smooth and readable.

Peer editing and group discussions of a text

From the writer to the reader –

   *Does my argument hold together? If not, where does it fall apart?

   *What do you think I am trying to say in this paragraph?

   *Do I make my points clearly? Where in my text am I not clear?

   *Have I left any important assumptions unstated?

   *Is this the best word to express my meaning?

   *Have I struck the best tone for this audience?

For the reader to think about while reading a text –

   *What more could the writer do to keep you interested in the "story"?

   *Where might the writer add additional detail or flesh out an argument?

   *Remaining true to the author's purpose, what specific additions would help the writer meet the goal of the paper?

   *Are there any awkward or confusing sentences? Where?

   *Are there any places where you would suggest a change in word choice for better clarity?

<u>Review of Important Concepts</u>

*General-to-specific movement in a paragraph or section

*General-to-specific-to-general movement in the paper as a whole

*General-to-specific movement in the introduction section -

>   The important role of the introduction, including the back story; the effort to bring in a few new readers if possible; the goal of bringing into focus your problem and why it is important for your consideration.

*Specific-to-general movement in the data commentary -

>   WALTER; strength of claim; excellent visuals and their captions; moving from specifics to more general observations.

*Suggestions while redrafting -

>   *Read aloud; make a few changes; move on

>   *Ask yourself questions and fill in the text with the answers –

>> -What is a specific example that supports this general idea?

>> -Why am I saying this? So what?

>> -Does this text really clarify the new point that I am making?

>> -Is the use of a single word the best and clearest way to capture the meaning I want, or do I need to use more words or even additional sentences to make my meaning clear?

>> *How do I know if my text is readable?

*Who decides what is clear and logical in a text?

*What is good writing? What is excellent writing?

Thoughts on writing

1) From <u>Writing for Computer Science</u>, by Justin Zobel, pp. 2-4.

It may seem unjust, but good writing and presentation can persuade readers that your work is of value. Poorly presented material carries a strong subconscious message; for example, readers tend to judge statements to be wrong if they contain numerous spelling errors. Layout issues such as font and spacing are also important – if they weren't, we would be as comfortable reading fixed-width fonts on a computer screen as we are reading text in a book. A lazy presentation suggests to the reader that little care has been taken with the work.

Thus the ability to write well is a key skill of science. . . Writing underpins the research cycle. A key aspect of writing is that the discipline of stating ideas as organized text forces you to formulate and clarify your thoughts. Vague concepts become concrete, the act of writing suggests new concepts to consider, written material is easier to discuss and debate with colleagues, and the only effective way to develop complex arguments or threads of reasoning and evaluate whether they are sound is to write them down. That is, writing is not the end of the research process, but instead shapes it. Only the styling of a paper, the polishing process, truly follows the research.

It is writing, too, that defines what we consider to be knowledge. Scientific results are only accepted as correct once they are refereed and published; if they aren't published, they aren't confirmed. Each new contribution builds on a bed of existing concepts that are known and, within limits, trusted. . .

For an idea to survive, other scientists must be persuaded of its relevance and correctness – not with rhetoric, but in the established framework of a scientific publication. New ideas must be explained clearly to give them the best possible chance of being understood, believed, remembered, and used. This begins with the task of explaining our ideas to the person at the next desk, or even to ourselves. It ends with publication, that is, an explanation of results to the research community. Thus good writing is a crucial part of the process of good science.

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2) From an interview with Stephen Jay Gould, paleontologist and author admired for his eloquent writing style.

Q: "What does writing do for you?"

A: "It's the best way to organize thoughts and to try and put things in as perfect and as elegant a way as you can. A lot of scientists hate writing. Most scientists love being in the lab and doing the work and when the work is done, they are finished. Writing is a chore. It's something they have to do to get the work out. They do it with resentment. Conceptually to them it is not part of the creative process. I don't look at it that way at all. When I get the results, I can't wait to write them up. That's the synthesis. It's the exploration of the consequences and the meaning."

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E.B. White from <u>The Elements of Style</u>

Clarity, clarity, clarity. When you become hopelessly mired in a sentence, it is best to start fresh; do not try to fight your way through against the terrible odds of syntax. Usually what is wrong is that the construction has become too involved at some point; the sentence needs to be broken apart and replaced by two or more shorter sentences.

When you say something, make sure you have said it. The chances of your having said it are only fair.

3) E.B. White from <u>The Elements of Style</u>

"Omit needless words!" cries the author on page 23, and into that imperative Will Strunk really put his heart and soul. . .

He was a memorable man, friendly and funny. Under the remembered sting of his kindly lash, I have been trying to omit needless words since 1919, and although there are still many words that cry for omission and the huge task will never be accomplished, it is exciting to me to reread the masterly Strunkian elaboration of this noble theme. It goes:

"Vigorous writing is concise. A sentence should contain no unnecessary words, a paragraph no unnecessary sentences, for the same reason that a drawing should have no unnecessary lines and a machine no unnecessary parts. This requires not that the writer make all sentences short or avoid all detail and treat subjects only in outline, but that every word tell."

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4) E.B. White from <u>The Elements of Style</u>

Style takes its final shape more from attitudes of mind than from principles of composition, for, as an elderly practitioner once remarked, "Writing is an act of faith, not a trick of grammar." This moral observation would have no place in a rule book were it not that style is the writer, and therefore what you are, rather than what you know, will at last determine your style. If you write, you must believe – in the truth and worth of the scrawl, in the ability of the reader to receive and decode the message. No one can write decently who is distrustful of the reader's intelligence, or whose attitude is patronizing.

Many references have been made in this book to "the reader," who has been much in the news. It is now necessary to warn you that your concern for the reader must be pure: you must sympathize with the reader's plight (most readers are in trouble about half the time) but never seek to know the reader's wants. Your whole duty as a writer is to please and satisfy yourself, and the true writer always plays to an audience of one. Full of belief, sustained and elevated by the power of purpose, armed with the rules of grammar, you are ready for exposure. . .

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5) From Chapter 20, "The Sound of Your Voice" in <u>On Writing Well</u> by William Zinsser

I wrote one book about baseball and one about jazz. But it never occurred to me to write one of them in sports English and the other in jazz English. I tried to write them both in the best English I could, in my usual style. . . Don't alter your voice to fit your subject. Develop one voice that readers will recognize when they hear it on the page. . .

Never hesitate to imitate another writer. Imitation is part of the creative process for anyone learning an art or a craft. Bach and Picasso didn't spring full-blown as Bach and Picasso; they needed models. This is especially true of writing. Find the best writers in the fields that interest you and read their work aloud. Get their voice and their taste into your ear – their attitude toward language. Don't worry that by imitating them you'll lose your own voice and your own identity. Soon enough you will shed those skins and become who you are supposed to become.