**English for Agriculture: Writing research articles in English**

**02 Developing academic literacies: Research article introductions**

These activities focus on the Introduction section of a typical research article. Research suggests that typically the Introduction section falls into 3 main moves with possible steps, such as the following:

1. *Establishing your research territory*
   1. Indicating that your topic is important in some way
   2. Making a generalisation about the topic
   3. Reporting relevant research
2. *Identifying a research niche*
   1. Challenging or questioning previous research
   2. Finding a gap in previous research
3. *Occupying the research niche*
   1. Summarising the aims of your research
   2. Previewing your research findings
   3. Summarising the structure of your article.

Not all of these moves and steps will be present in any given article, but they very often are. Can you recognize them in the following article?

Shigaki, F., Sharpley, A., & Prochnow, L. I. (2006). Animal-based agriculture, phosphorus management and water quality in Brazil: Options for the future. *Scientia Agricola*, 63(2), 194-209.

1. Read the Introduction section of the article from *Scientia Agricola*,and answer the following questions.
2. Identify the topic generalisation that begins the Introduction. What kind of language is used to indicate the importance of the topic? Notice the tense used.
3. Identify the beginning and end of the section that summarises relevant previous research. Notice the use of tenses: (1) simple present to indicate current facts; (2) present perfect to indicate actions in the past, without indicating a specific time reference, or to indicate past actions with present relevance; (3) simple past tense to ‘anchor’ actions with reference to particular points of time in the past.
4. Identify the second move. How is the beginning of this move signalled? Is the previous research challenged, or extended in some way?
5. How do the researchers occupy their research niche? Again, pay attention to the language they use to do this.

Recent assessments of water quality status have identified eutrophication as one of the most ubiquitous water quality impairments in the U.S., Europe, and Australasia (Heaney et al., 2001; New Zealand, 1997; U. S. Geological Survey, 1999). Eutrophication is the natural aging of lakes or streams brought on by nutrient enrichment. This process can be greatly accelerated by human activities which increase nutrient loading rates to water. While both phosphorus (P) and nitrogen (N) contribute to eutrophication, P is the primary agent in freshwater eutrophication, as many algae are able to obtain N from the atmosphere (Schindler, 1977). Thus, controlling eutrophication mainly requires reducing P inputs to surface waters, despite the fact that P is an essential nutrient for crop and animal production.

Eutrophication restricts water use for fisheries, recreation, and industry due to the increased growth of undesirable algae and aquatic weeds and oxygen shortages caused by their death and decomposition. Also, an increasing number of surface waters have experienced periodic and massive harmful algal blooms (e.g., cyanobacteria and Pfiesteria), which contribute, along other things, to summer fish kills, unpalatability of drinking water, formation of carcinogens during water chlorination, and links to neurological impairment in humans (Burkholder & Glasgow Jr., 1997; Howarth et al., 2000).

Although concern over eutrophication is not new, there has been a profound shift in our understanding of, and focus on, sources of P in water bodies. Since the late 1960s, the relative contributions of P to water bodies, both from point and diffuse sources, have changed dramatically. On one hand, great strides have been made in the control of point source discharges of P, such as the reduction of P in sewage treatment plant effluent. These improvements have been due, in part, to the ease in identifying point sources. On the other hand, less attention has been directed to controlling diffuse sources of P, due mainly to the difficulty in their identification and control (Sharpley & Rekolainen, 1997). Thus, control of diffuse sources of P is a major hurdle to protecting fresh surface waters from eutrophication (Sharpley & Tunney, 2000; Withers et al., 2000). While a variety of diffuse sources, ranging from suburban to construction areas, contribute P to water bodies, agriculture, particularly intensive animal agriculture, is receiving more research, public, and regulatory attention (Kellogg et al., 2000; Sharpley, 2000; U.S. Environmental Protection Agency, 2004). There is, however, no information on the role of agricultural management on P loss as related to water quality impairment in Brazil.

The aim of this paper is to (1) show how agricultural production systems in Brazil have changed over the last decade in ways that have increased the potential for P loss in runoff, (2) present research on factors controlling P loss from agricultural land to water, and (3) show how this information can be used to develop agricultural management strategies that minimize the potential for P loss from Brazilian agricultural systems. For this discussion, information will be present on the basis of the five regions of Brazil; North, Northeast, Central-west, Southeast, and South (Figure 1)

1. Now return to the article that you chose on a topic that interests you.
   1. Read the Introduction section and ask the same questions that you asked about the article above.
   2. Colour code the three moves and upload the Introduction to moodle.
   3. Note down any useful language. Add any particularly useful vocabulary to **Your Vocabulary List** on moodle.
2. Think of a piece of research that you have been involved with.
   1. Write a suitable 3-move Introduction for an article about it.
   2. Upload the **Introduction** of your article to moodle.
3. In the learning blog on moodle, write around 150-200 words in your learning blog, e.g. on the following topics:

* Useful language to indicate the importance of research topics
* Questions/comments about how you summarise previous research
* The pros and cons of challenging previous research (ie suggesting it is wrong), versus finding a gap in previous research
* Useful language for occupying the niche in your own research area