Tutor and student perspectives on multimodal features of undergraduate assignments

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Version: Accepted Manuscript

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Tutor perspectives on the use of visuals in undergraduate assignments

Maria Leedham
maria.leedham@open.ac.uk

WRAB 2014
The traditional focus within the teaching of academic writing is on linear prose and little research has been conducted on additional semiotic modes. This study explores the use of visuals, layout and list writing in assignments from two student groups: L1 Chinese and L1 English undergraduates in three disciplines (Biology, Economics and Engineering). The paper explores proficient undergraduate assignments drawn from the British Academic Written English corpus, revealing that the L1 Chinese students make significantly greater use of visuals and lists than L1 English students in the same disciplines. The presentation then reports on findings from interviews with tutors and students, exploring their views on the use of visuals and lists in assessed writing. It is suggested that academic writing tutors could provide more guidance to all undergraduate students as to the range of acceptable ways of meaning making within assessed undergraduate writing.
Aim

• Investigate the writing of L1 Chinese and L1 English students in three disciplines (Biological Sciences, Economics and Engineering).

Outline of this talk

1. Establish that there are differences in use of visuals
2. Investigate tutors’ views on this
3. Explore writing tutors’ views
Background: Framing in academic literacies

Deficit approach

- student writing is ‘remedial’, ‘immature’ and contains ‘problems’ or ‘errors’ - especially L2 English student writing
  (Chen and Baker, 2010; Paquot, 2010)

Vs.

Academic literacies approach

- writing within the academy is a set of social practices in which genre, context and culture are highly significant
- highlights ‘the variety and specificity of institutional practices, and students’ struggles to make sense of these’ (Lea and Street, 2006: 376).
- *All* student writers are in a constant struggle to establish the preferred ways of making meaning within their particular context (e.g. Lillis, 2006).
The data

The corpora

- British Academic Written English (BAWE) & beyond
- All proficient writing
- 58 texts from L1 Chinese students (107,000 words)
- 202 texts from L1 English students (429,000 words)

Interviews & questionnaires

- Interviews with 20 lecturers in Biological Sciences, Economics and Engineering in 7 UK universities
- Questionnaire responses from 200+ writing teachers
- Questionnaire & interviews with students

ESRC project number
RES-000-23-0800
A year 3 Engineering assignment
Visuals

Table 1

<table>
<thead>
<tr>
<th>Carbon Content %</th>
<th>Classification</th>
<th>General Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3-0.4</td>
<td>Low Carbon Steel</td>
<td>General for weld</td>
</tr>
<tr>
<td>0.3-0.7</td>
<td>Medium Carbon Steel</td>
<td>Used for bolts, nuts, screws, and bolts</td>
</tr>
<tr>
<td>0.7-1.7</td>
<td>High Carbon Steel</td>
<td>Use in applications</td>
</tr>
</tbody>
</table>

Figure 7

Figure 8

Figure 9

Photograph 9 – Tree shrew pollinating the male flower

[Attenborough, 1995]
Lists and ‘listlikes’

- Sales promotion:
  - Monthly promotions, according to customer sales and current interest
  - Discounts for bulk orders
  - Free P&P on orders over £25, encouraging bulk buying
  - Discounts for new businesses using us for the first time, on condition they use us for a minimum of two more orders

- Public relations:
  - User friendly website
  - Easy search tools within website, enabling you to find the exact bulb you want even for the engineering minded
  - Extensive “Help” and “FAQ” pages
  - 12hour guaranteed reply to email queries

Conclusions

The experiment yielded the following conclusions:

- The efficiency of a single stage centrifugal pump at high pump speed (3000 RPM) is better than it at low pump speed (2000 RPM).
- The input power with high pump speed increases faster than the one with low pump speed as discharge increases.
- The relationship between total head and discharge is not affected by pump speed, but higher pump speed provides higher total head.
Methods

1. Extraction of corpus linguistic keywords and counts of visuals

2. Thematic analysis of lecturer interviews – some featuring paired texts

3. Quantitative and qualitative analysis of questionnaire responses
### Keywords relating to visuals and lists

<table>
<thead>
<tr>
<th>L1&amp; discipline</th>
<th>Chi-Biol</th>
<th>Chi-Econ</th>
<th>Chi-Engin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selected keywords</td>
<td>#</td>
<td>growth</td>
<td>#</td>
</tr>
<tr>
<td>#</td>
<td>table</td>
<td>curve</td>
<td>eq.</td>
</tr>
<tr>
<td>data</td>
<td>refer</td>
<td>according</td>
<td></td>
</tr>
<tr>
<td>equation</td>
<td>model</td>
<td>figure</td>
<td></td>
</tr>
<tr>
<td>figure</td>
<td>per</td>
<td></td>
<td></td>
</tr>
<tr>
<td>graph</td>
<td>output</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A word which is *positively* key occurs *more* often than would be expected by chance in comparison with the reference corpus.
Keywords relating to visuals and lists

Biology
• All "Phases" are labeled on the graph. The curve of the Exponential Phase was straight, though some point lay outside this best straight line of fit (0041a).

Economics
• Actually the total loss resulting from the lower monopoly output (Q M) is the grey triangle. The part of the grey triangle above P C is the loss of consumer surplus (6008q).

Engineering
• According to the program and refer to the figure 4.1.1, it is easy to find… (6107d).
<table>
<thead>
<tr>
<th></th>
<th>Tables</th>
<th>Figures</th>
<th>Lists</th>
<th>Listlikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Biology</td>
<td>15****</td>
<td>25****</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Eng-Biology</td>
<td>5</td>
<td>13</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Chi-Economics</td>
<td>1</td>
<td>14****</td>
<td>2*</td>
<td>25****</td>
</tr>
<tr>
<td>Eng-Economics</td>
<td>0</td>
<td>12</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Chi-Engineering</td>
<td>10*</td>
<td>21</td>
<td>7</td>
<td>53****</td>
</tr>
<tr>
<td>Eng-Engineering</td>
<td>7</td>
<td>21</td>
<td>10</td>
<td>24</td>
</tr>
</tbody>
</table>

per 10,000 words

* p<.05
** p<.01
**** p<.0001
Summary… and some questions

Summary

- L1 Chinese students make significantly greater use of visuals and lists than L1 English students
- All BAWE assignments have been judged proficient
- \(=>\) suggests these are different, yet equally valued, ways of writing

Questions

- Are visuals and lists used as strategies to meet the challenge of producing extended pieces of writing in unfamiliar genres in L2?
- Perhaps some students are more visually-oriented?
- What do discipline tutors think of this greater use of visuals and lists?
- Do writing tutors teach students how to use visuals and lists as strategies?
The role of maternal effect genes in the development of the nematode *Caenorhabditis elegans*

**ABSTRACT**

*Caenorhabditis elegans* (C. elegans) has been used as one of the favourite model organisms for developmental studies. These nematodes are maternal effect genes that are important for the cell lineage and specification. In this review, the early embryogenesis of *C. elegans* extensively relies on maternal genes. The role of maternal genes is not in the lineage of cell and fate determination. Posterior polarity is initiated by spermatogenesis of *C. elegans*. Posterior polarity is induced by a variety of molecular mechanisms that are carried out by determinants underling these processes.

**INTRODUCTION**

The *C. elegans* and its life cycle

*Caenorhabditis elegans* (C. elegans) is a nematode that has a predominantly hermaphrodite and is an important model organism for developmental biology. The life cycle of *C. elegans* contains an embryonic stage, four larval stages (L1 to L4) and an adult stage. (Fig. 2) Molt (apoptosis, new cuticle formation, and ecdysis) takes place at the end of each larval stage. Under certain external conditions such as starvation, a non-growing stage, dauer larva, may form through a facultative, reversible arrest at the lethargus in the second of four cuticle molts. The life cycle is about 2 to 3 weeks. Each somatic cell in the adult, which can be easily traced during development through the transparent cuticle (Sulston & Horvitz, 1977). *C. elegans* is a small roundworm, approximately 1 mm long, that lives for 2-3 weeks and can be fed on *Escherichia coli*, which allows large numbers to be conveniently raised in a Petri dish. The predominant adult form is hermaphroditic, containing both sperm and eggs and therefore reproduction is rapid, either by self-fertilization or by cross-fertilization with the rare males.

**Reproduction**

In hermaphrodite worms, fertilization occurs in the spermatheca – an organ where the sperm is stored – when mature oocytes pass from the ovary towards the vulva (Fig 1A-B). The point of sperm entry determines the posterior end of the embryo. After fertilization, a rigid, ovoid-shaped cell, called the chorion, is made (Kemphaes & Strome, 1997) and the long axis of this ovoid is termed the antero-posterior (ap) axis of the embryo.
Bulleted lists vs. connected prose in Economics

Lecturer interviewees preferred the Chinese students’ text as it was considered:
• ‘more readable’,
• shows ‘clear logic’
• ‘easy to understand’.

A bulleted list was described as a good communication tool, giving visual emphasis to the main points and gaining the attention of a time-pressed reader.

Using ‘a mix of techniques’ such as headings and bullets is good as it ‘adds variety’.

2. Bivariate Regression

(a) Descriptive Statistics

The following results are for

\[ \text{QTMARK} = 64.9672 \]

Interpretation for the regression:
1. The intercept 64.97 means that the average score for the entire class was 64.97.
2. The slope coefficient of 0.06, or 0.06 points, indicates that for every unit increase in the independent variable (in this case, lecture attendance), the dependent variable (QTMARK) increases by 0.06 points.

(b) Correlation Matrix

The correlation matrix provides information about the relationships between the variables. In this case, the correlation coefficient between QTMARK and ATTENDANCE is 0.63, indicating a strong positive relationship. This means that as attendance increases, QTMARK also tends to increase.

Using a mix of techniques such as headings and bullets is good as it ‘adds variety’.
Themes from lecturer interviews 1

Importance of visuals

• Diagrams and formulae are ‘the spine of the essay’ (Economics)
• The ‘challenge’ is ‘to marry the diagrams with the text’ (Economics)
• Including visuals helps students gain better marks as it avoids having to describe - and risk introducing errors (Biology)
• Marks for presentation may include the assessment of diagrams, tables and overall layout (Engineering).

Being concise

• Preference for ‘precision, incision, concision’ (Economics)
• ‘there’s never been a penalty for an essay that’s too short’ (Biology)
• Good writing is ‘clear’, ‘concise’; dislike of ‘verbosity’ (Engineering)
• British ss ‘use too many words’ - ‘don’t use 10 when you can use 5’.
• Proforma may say ‘include a table here’. May be given font sizes, margin size, line spacing, ‘so people can’t cram in words’.
Themes from lecturer interviews 2

Bulleted lists are ok

• …but the words have to be ‘particularly good’
• ‘easier to mark if bullet points’
• in exams, bullets are ‘ideal’ not paras. ‘no need to dress it up as an essay’. Be straightforward. (Engineering)
• ‘Gives visual emphasis’.
• ‘essay questions allow you to hide the things you don’t know.’ (Economics)

‘Maths-oriented’ and ‘journalistic’ students in Economics

• 2 types of student – ‘maths-inclined student who would be happy putting bullet points instead of prose’ and students who are good at writing prose but ‘not as strong mathematically’.
• students see essays as a ‘refuge from problem-solving questions’
Yet…

- ‘graphic literacy’ and use of lists are seldom taught in writing classes – *why?

- Most applied linguists are ‘trained in the humanities, where words are central to disciplinary values and argumentation’  – Johns (1998:183)

- Tutors may ‘find themselves relying on disciplinary norms they are familiar with’  – (Gardner and Holmes, 2009: 251)

- There’s often a concentration on ‘linear text’ (Johns, 1988: 183) rather than on the interaction of visuals with text.
Survey of writing tutors

- 219 responses
- 87% of respondents teach in universities
- 60% have been teaching for 10 years +
- 50% + have a Masters degree in Applied Linguistics or Education
- 20% teach at foundation level, 36% UG in-sessional, 34% postgraduate
- Teach a mix of L1 English only, L2 English only, and both L1 and L2 English students
Teaching the use of visuals

Writing Tutors’ views

- ‘My students need to use visuals in their discipline(s).’ 90% agree
- ‘I teach my students how to include visuals within their academic texts.’ 72% agree
- ‘On the presessional course in the UK I taught on, lists were certainly discouraged and little explicit attention was paid to integrating visuals into writing.’
- ‘We are often quite detached from the disciplines because our students go into so many different spaces after completing foundation’
- ‘Some students are permitted to use these features and some not, so for this reason it is not sensible to teach them.’
- ‘I have students do an ethnography of writing in their field, so that they can answer these questions.’

- ‘The visuals are too complicated and student specific for me to know thoroughly and they know them better.’
- ‘I don’t know much about their individual subjects - just general knowledge or what I pick up from them.’
Implications for teaching writing

• remain open-minded as to what might be acceptable in different disciplines;
• broaden the range of genres practised;
• include visuals and lists in academic writing classes;
• help students to research writing in their discipline (cf. Johns', 1997, plea for students to become researchers of their disciplines' practices; consider data-driven learning using corpora such as BAWE for particular discipline features?);
• collect exemplars of the writing their students are asked to produce;
• move beyond lexicogrammatical considerations such as the acceptability of I or the choice of passive or active voice to considering assignments holistically (e.g. Is it ok to use a table to display results or should these be given in prose? Can the conclusion be presented as a bulleted list? If images are given, can a lengthy caption be included?);
References