Embracing different semiotic modes in undergraduate assignments

Conference or Workshop Item

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Embracing different semiotic modes in undergraduate assignments

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WDHE 2012
Outline

1. Background

2. Corpus data and methods

3. Findings
   - from corpus linguistic keywords and counts
   - from comparison of pairs of assignments
   - from interview data

4. Implications
Outline

1. Background
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   - from interview data
4. Implications
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).
Background: Undergraduate assignments

- high-stakes, occluded and under-researched

- from monolithic to research on disciplinary differences (e.g. Hewings, 1999; Hyland, 2008).

- increasing awareness of range of genres required at UG level.
  (Leedham, 2009; Nesi & Gardner, 2006).

- rise in new genres – (e.g. e-posters, reflective blogs, website evaluations, press releases).

  ‘unprecedented amount of innovation in assessment’ (Gibbs, 2006:20).
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Corpus data

British Academic Written English (BAWE)
- 6.5 million words
- 2,761 assignments
- 1,039 writers
- 30+ disciplines
- Variety of L1s
- All proficient writing

The corpora for this study
- L1 English & L1 Chinese UG texts from BAWE & beyond
- 5 disciplines
- =>
  - 104 texts from Chinese students
  - 295 texts from British students
- *Plus* insights from lecturer interviews

ESRC project number
RES-000-23-0800
Methods

1. Corpus linguistic keywords and counts
2. Comparison of pairs of assignments
3. BAWE lecturer interviews
Outline

1. Background

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3. Findings
   - from corpus linguistic keywords and counts
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4. Implications
Keywords relating to visuals and lists

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</table>
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).

Food Science
• According to the 3 sets of data calculated above… (6150d).
A year 3 Engineering assignment
Photograph 9 – Tree shrew pollinating the male flower

[Attenborough, 1995]

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Table 1

Visuals
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
  - 12 hour 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.
## Counts of visual and list items

<table>
<thead>
<tr>
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<th>Figures</th>
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</tbody>
</table>

* per 10,000 words
** p<.01
*** p<.001
**** p<.0001
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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. Embryogenesis of C. elegans extensively relies on maternal effect genes for intrinsically asymmetric cell division and cell-cell interactions. In this review, the early embryogenesis of C. elegans, from the establishment of Anterior-Posterior polarity initiated by sperm entry to the asymmetrical cell divisions and different cell lineages induced by a variety of cell fate determinants is summarized, some of the molecular mechanisms carried out by the crucial maternally expressed cell fate determinants underlying these processes are described.

INTRODUCTION

The C. elegans and its life cycle

Caenorhabditis elegans (C. elegans) is a small (~1mm long) free living soil nematode that has a predominantly hermaphroditic adult life. (Figure 1)

Figure 1  Adult C. elegans [1] Upper diagram: differential interference contrast image of an adult C. elegans; Lower diagram: anatomical structures of adult C. elegans (schematic drawing); Middle Left scale bar: 0.1 mm

The life cycle of C. elegans contains an embryonic stage, four larval stages (L1-L4) and an adult stage. (Figure 2) Molt (apoplosys, 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 molt. The life cycle is about 2 to 3 weeks. Each

The role of maternal effect genes in the development of the nematode Caenorhabditis elegans

Maternally expressed genes are essential for the correct patterning and cell fate determination in the early Caenorhabditis elegans embryo. The PAR proteins and MEX-66 are responsible for initial polarisation of the zygote, skn-1 is required to specify the EMS fate, the bifunctional protein PIE-1 is required to maintain the totipotent germ cell lineage and specification of the AB lineage involves a system homologous to notch in Drosophila. This review describes the current understanding of these molecular mechanisms in the specification of cell fates in the pregastrulation embryo.

Introduction

The potential of Caenorhabditis elegans as a model organism for the study of embryology emerged in the 1970s (Brenner, 1974). This free-living soil nematode is ideal for studying in the laboratory as it has a rapid period of embryogenesis (16 hours) and each worm has an invariant cell lineage, with exactly 959 somatic cells 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 chitin eggshell called the chorion is made (Kenphues & Strome, 1997) and the long axis of this ovoid is termed the anterior-posterior (A/P) axis of the embryo.

L1 Chinese writer  
L1 English writer
## Visuals and extended captions in Biology

- **Comparison of two Biology assignments**

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Diagrams and extended captions in text by Chinese writer

- 186 words
- different font
- text wrapping
- full sentences
- same neutral stance as main prose (e.g. use of passives, no first person pronouns, formal language)
- freestanding text i.e. separate reading path
Question 1

Interpretation of results (equations 4 and 5 appendix 2)

The coefficient on class attendance is 0.13, which implies that holding all other variables constant, if you increase class attendance by 1 unit (1% increase in class attendance in a year), then the exam mark will increase by 0.13 units. 0.13% increase in your mark. The coefficient on lecture attendance is 0.05, meaning holding all other variables constant, attending 1% more lectures will increase your mark by 0.05%. The coefficient on revision lecture attendance is slightly surprising, at 0.04, implying that attending 1% more revision lectures, your mark will decrease by 0.04%. The intercept can be interpreted to mean that if you attended no classes, revision or standard lectures, you would score 40.35%.

Tests (shown in appendix 2)

The coefficient on class attendance was significant at the 0.01% level implying that in the multiple regression models, class attendance has a significant impact on test mark. The coefficient on lecture attendance however was not significant at the 1% level, implying perhaps that lecture attendance does not have a significant impact in a univariate framework.

The regression coefficients are significant at the 1% level, meaning that we can be fairly sure that the variables have a significant impact on the dependent variable. However, multicollinearity on the other hand, students having a good A-level record maintained their high working attitude.

2. Bivariate Regression and Multivariate Regression

(a) Bivariate Regression

\[ \text{QTMARK} = \beta_0 + \beta_1 \text{ATR} + \text{u} \]

The following results are obtained after running the bivariate regressions in Excel to determine the impact of class attendance on exam performance.

\[ \text{QTMARK} = 64.67025 - 0.002317 \text{ATR} \]

Interpretation for the regression results:

- The intercept -64.67 means that even students who did not attend any revision lecture, they could get 64.97 in the exam, which may not make much economic sense as revision lectures are designed to boost a student's exam mark.
- Higher coefficient of -0.0022 shows an inverse relationship between the attendance of revision lecture and exam performance. It means that 1% increase in the proportion of revision lecture attendance would decrease A level mark by 0.02% in the exam. However, coefficient of -0.0022 implies a small range of the coefficient, so it's not a significant impact.

(b) Multivariate Regression

\[ \text{QTMARK} = \beta_0 + \beta_1 \text{ATR} + \beta_2 \text{ABILITY} + \beta_3 \text{HSQT} + \text{u} \]

Modelling by OLS, we get:

\[ \text{QTMARK} = 36.5253 + 0.165045 \text{ATR} + 0.849906 \text{ABILITY} + 0.417658 \text{HSQT} \]

Interpretation of the regression results:

- As expected in question 1, the correlation coefficient was 0.67.

L1 Chinese writer

EC 226 ECONOMETRICS 1 Assignment 1

 anonymized: student number


These qualitative variables would have some impacts on the QTMARK, but whether they are statistically significant will be investigated later.

Correlation matrix:
- The correlation matrix shows that QTMARK has strong positive relationships with variables ABILITY, ALEVELS, ATT, ATIN and strong negative relationships with variables EXPALC and TOPS.
- The correlation between ATT and ALEV is very high. Therefore, multicollinearity is an issue needed to think about later on.
- EXPALC has a strong negative relationship with ATT, ATIN, and strong positive relationships with TOPS. It could be explained that students who got drunk could not get up early to attend for lectures and classes. The more TOPS they attended, the more money they spent on alcohol.
- Generally, HSQT has a strong positive relationship with ALEVELS and ALEVELS.

Bulleted lists vs. connected prose in Economics

L1 English writer
Bulleted lists vs. connected prose in Economics

<table>
<thead>
<tr>
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</table>
Bulleted lists vs. connected prose in Economics


Three qualitative variables would have some impacts on the QTMARK, but whether they are statistically significant will be investigated later.

In general, there is a strong positive relationship between QTMARK and EXPALC and TOPS, but a strong negative relationship with L1 Chinese writer.

The correlation matrix for QTMARK and other variables is given in the Appendix, showing the following (at the 0.05 level):

- QTMARK vs. EXPALC (0.45, 0.002)
- QTMARK vs. TOPS (0.46, 0.001)
- QTMARK vs. L1 English writer (0.32, 0.02)
- QTMARK vs. L2 Chinese writer (0.30, 0.03)
- QTMARK vs. L2 English writer (0.31, 0.03)

In conclusion, the results indicate that the L1 Chinese writer has a significant impact on the QTMARK, which is in line with previous research on the importance of language proficiency in academic performance.

2. Bivariate Regression and Multivariate Regression

(a) Bivariate Regression

<table>
<thead>
<tr>
<th>QTMARK</th>
<th>0.45 EXPALC</th>
<th>0.46 TOPS</th>
<th>0.32 L1 English writer</th>
<th>0.30 L2 Chinese writer</th>
<th>0.31 L2 English writer</th>
</tr>
</thead>
<tbody>
<tr>
<td>QTMARK</td>
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<td>0.46</td>
<td>0.32</td>
<td>0.30</td>
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<td>0.46</td>
<td>0.32</td>
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<tr>
<td>L1 English writer</td>
<td>0.32</td>
<td>0.30</td>
<td>0.31</td>
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<tr>
<td>L2 Chinese writer</td>
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<td>0.31</td>
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<td>L2 English writer</td>
<td>0.31</td>
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</table>

**Interpretation of the results:**

- The coefficient of 0.46 for TOPS means that a one-unit increase in TOPS is associated with a 0.46 increase in QTMARK, controlling for other variables.
- The coefficient of 0.45 for EXPALC indicates a strong positive relationship, with a 0.45 increase in EXPALC leading to a 0.45 increase in QTMARK.

(b) Multivariate Regression

<table>
<thead>
<tr>
<th>QTMARK</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>0.45 + 0.46 EXPALC + 0.32 TOPS + 0.30 L1 English writer + 0.31 L2 Chinese writer + 0.31 L2 English writer</td>
</tr>
</tbody>
</table>

**Modelling by GLS:**

QTMARK = 36.5257 + 0.108594 (EXPALC) + 0.24094 (TOPS) + 0.47658 (L1 English writer) + 0.41765 (L2 Chinese writer) + 0.41765 (L2 English writer)

**Interpretation of the regression results:**

- The coefficient of 0.46 for TOPS indicates a significant positive relationship, with a one-unit increase in TOPS leading to a 0.46 increase in QTMARK.
- The coefficient of 0.45 for EXPALC also shows a strong positive relationship, with a one-unit increase in EXPALC leading to a 0.45 increase in QTMARK.
- The coefficient of 0.32 for L1 English writer indicates a moderate positive relationship, with a one-unit increase in L1 English writer leading to a 0.32 increase in QTMARK.
- The coefficients for L2 Chinese writer, L2 Chinese writer, and L2 English writer are similar, indicating moderate positive relationships.

**Conclusion:**

The results suggest that the L1 Chinese writer has a significant impact on the QTMARK, followed by the L2 Chinese writer and L2 English writer. Expanding the scope of the study may further elucidate the role of language proficiency in academic performance.
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Interviews with lecturers

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 introducing errors (Biology)
• ‘there is no existing document out there which explains how to interpret their data’ (Biology)
• Marks for presentation may include the assessment of diagrams, tables and overall layout (Engineering).

Being concise

• Lecturers value writing which is ‘clear and concise’, and ‘succinct’ and dislike ‘verbosity’ (Engineering)
• Preference for ‘precision, incision, concision’ (Economics)
• ‘there’s never been a penalty for an essay that’s too short’ (Biology)
Embracing different semiotic modes

Summary

• Chinese students make significantly greater use of visuals and lists than British students
• All BAWE assignments have been judged proficient
• => different, yet equally valued, ways of writing

Possible reasons

• Are visuals and lists used as a strategy to meet the challenge of producing extended pieces of writing in unfamiliar genres in L2?

• Perhaps some students are more visually-oriented? – Chinese languages are more visual…

• Use of visuals is highly valued in particular disciplines e.g. Engineering, Economics, Biology. Since Chinese students tend to study hard-applied disciplines more than soft-pure disciplines, maybe the use of visuals and lists crosses over??
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Embracing different semiotic modes

• Yet…. ‘graphic literacy’ is seldom taught in EAP classes – *why?*

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

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

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

• ‘for students who face the challenge of writing extended, factual, evidence-based, and disciplinarily specific texts, there is still relatively little on the market’.
  Tribble (2009, p. 416) in a review of EAP textbooks
Implications for practice: EAP tutors

• remain open-minded as to what might be acceptable within unfamiliar disciplines and genres;
• include ‘graphic literacy’ in academic writing classes;
• search corpora (e.g. BAWE, MICUSP) for particular discipline features to identify ways in which these vary;
• collect exemplars of the kinds of 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?);
• encourage students to question their discipline tutors;
• work with discipline tutors to undertake the following strategies …. 
Implications for practice: discipline tutors

- provide undergraduate students and EAP tutors with explicit guidance as to what is required in assignments, particularly within unfamiliar genres;
- give exemplars and accompanying commentary to illustrate possible assignment responses - providing several examples gives a sense of the range of acceptability permitted;
- attempt a new assignment themselves in order to see where the rubric fall short;
- allow dedicated time within lectures for students to interview them about the assignment;
- avoid frequent misunderstandings of rubric by adding clarification in subsequent years.
Implications for practice: students

• research writing in their discipline (cf. Johns', 1997, plea for students to become researchers of their disciplines' practices);
• ask questions of both EAP and discipline tutors as to what is, or might be, considered proficient writing;
• seek out exemplars of writing of the type they are being asked to produce (e.g. ask tutor to provide previous cohort’s assignments);
• talk about writing with peers – what is expected? What will this assignment look like? (layout, use of tables/graphs/images/lists).
References


• Leedham, M. (2009) ‘From traditional essay to ‘Ready Steady Cook’ presentation: reasons for innovative changes in assignments’ In Active Learning in HE.

