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CHAPTER 12
LEARNING FROM LECTURERS:
WHAT DISCIPLINARY PRACTICE
CAN TEACH US ABOUT “GOOD”
STUDENT WRITING

Maria Leedham

This study brings together the methodology of corpus linguistics and the framing of academic literacies in an exploration of Chinese and British students’ undergraduate assignments in UK universities. I consider how student writing, particularly that of non-native speakers (NNSs), is traditionally framed as deficient writing within corpus linguistics, and discuss how an academic literacies approach challenges this assumption.

One finding revealed through the analysis is the Chinese students’ significantly higher use of tables, figures, images (collectively termed “visuals”), formulae and writing in lists, in comparison with the British students’ writing, and the chapter provides data on this from Economics, Biology, and Engineering. Detailed exploration of individual assignments in Engineering together with interview data from lecturers in the three disciplines suggests that high use of visuals, formulae, and lists rather than writing mainly in connected prose is a different, yet equally acceptable, means of producing successful assignments. This is in marked contrast to the usual focus within English for Academic Purposes (EAP) classes on traditional essays written in continuous prose. In this paper I argue that writing teachers could usefully draw on an academic literacies approach as a way to expand their ideas of what constitutes “good” student writing and to transform their pedagogical practice in a way that recognizes student diversity rather than deficit.

UNDERGRADUATE WRITING IN UK UNIVERSITIES

Many researchers have emphasized how university students have to learn to write in ways prescribed by their discipline in order to have their voices heard (e.g., Nigel Harwood & Gregory Hadley, 2004; Ann Hewings, 1999; Ken Hyland, 2008; Sarah North, 2005), and this point is central to scholars within academic
literacies (e.g. Mary Lea & Brian Street, 1998; Theresa Lillis, 2001). Despite the
growing recognition of disciplinary difference and the importance of student voice,
most EAP classes comprise students from a broad range of subject areas through
practical necessity. At postgraduate level, students are likely to be familiar with the
conventions of their discipline, and to be writing within familiar genres such as a
research report or dissertation. At undergraduate level, however, students are still
learning how to write in their discipline(s) and additionally have to contend with the
recent “unprecedented amount of innovation in assessment” (Graham Gibbs,
2006, p. 20). This plethora of new genres at undergraduate level includes e-posters,
websites and reflective journals and represents a move away from the traditional
undergraduate essay (Lisa Ganobcsik-Williams, 2004; Maria Leedham, 2009; Hil-
ary Nesi & Sheena Gardner, 2006).

While students may look to writing tutors for guidance in coping with writing in a new discipline and new genres, most applied linguists (and by implication most EAP and writing tutors) are “trained in the humanities, where words are central to disciplinary values and argumentation” (Ann Johns, 1998, p. 183). Tutors may thus “find themselves relying on disciplinary norms they are familiar with” (Sheena Gardner & Jasper Holmes, 2009, p. 251) and it is likely that these norms will include a concentration on “linear text” (Johns, 1998, p. 183) rather than on the interaction of visuals, formulae and lists with prose. The use of EAP textbooks does not resolve this problem since, as Chris Tribble points out, “the majority of the writing coursebooks … focus on developing essayist literacy” (2009, p. 416).

EXPLORING STUDENT WRITING
THROUGH CORPUS LINGUISTICS

The dataset in this study is first approached through corpus linguistics, a rap-
idly-growing field involving the investigation of language use through organized,
electronically-stored collections of texts (or “corpora”). Common methodological
procedures include counting the frequency of textual features, comparing one cor-
pus with a larger “reference” corpus and extracting contiguous word sequences (see Stefan Gries, 2009, for a readable introduction). Findings from these procedures are supported in this study by qualitative analysis of selected texts and data from lecturer interviews.

The majority of corpus linguistic studies of student writing, particularly NNS writing, adopt a deficit approach in which NNS writing is compared to either NS student or professional academic writing and seen to fall short of these “norms.” The language used to report these studies is thus couched in terms of a deficit discourse rather than one of variational “difference.” For example Gaëtanelle Gilquin
and Magali Paquot (2008, p. 58) suggest that “remedial materials” are required to help NNSs “overcome register-related problems,” and Yu-Hua Chen and Paul Baker (2010, p. 34) discuss “immature student academic writing … [across] three groups of different writing proficiency levels” in their corpora of NNS student, NS student and expert academic writing. Thus a linguistic proficiency cline is often visualised from low to high-level NNSs followed by NSs and culminating in the language of professional academic writers, at which point the NS/NNS distinction ceases to be noteworthy. In contrast, the academic literacies perspective adopted here does not dichotomize NS and NNS students but instead views all undergraduates as learners of writing within the academy, while acknowledging the additional challenges faced by L2 English writers (see Ramona Tang, 2012b, for studies on this theme).

**DATA AND METHODS**

The dataset for this study is a subset of the British Academic Written English² (BAWE) corpus (Nesi & Gardner, 2012) (see BAWE site for details of corpus holdings) with a small number of additionally-collected assignments from Chinese undergraduates, and comprises texts from 12 disciplines and across three years of undergraduate study. All assignments achieved a minimum score of 60% from discipline lecturers (a First [distinction] or Upper Second [merit] in the United Kingdom) and can thus be said to represent “proficient” student writing since they met marking expectations to a sufficiently high extent (cf. Gardner & Holmes, 2009). Alongside the compilation of the BAWE corpus, interviews with 58 lecturers were conducted to provide an emic perspective on what this proficiency entails and on valued and “disliked” features of undergraduate assignments (Nesi & Gardner, 2006).

An initial search was carried out on the datasets to compare the frequency of single words and contiguous word sequences in the 279,000-word Chinese corpus with those in the 1.3 million word reference corpus of British students’ writing in the same 12 disciplines to uncover items used statistically more frequently in the former. The resulting “keywords” include numbers, formulae and references to data items (e.g., according to the + figure/appendix/equation, refer to (the) + figure/table + [number]), suggesting that the Chinese students make greater use of formulae, visuals and numbered lists than the British students (see Leedham, 2012 for a fuller account of the keyword process).

To determine the usage of these items, the number of disciplines was narrowed to three (Biology, Economics and Engineering), chosen as they offered a range of texts across student corpora and year groups (see Table 12.1).

As several keywords refer to tables, figures and formulae, or appear to be part of numbered lists, automatic counts were conducted of these textual features (see Table 12.2).
Table 12.1 Discipline subcorpora

<table>
<thead>
<tr>
<th>Discipline</th>
<th>No. texts</th>
<th>No. words</th>
<th>No. texts</th>
<th>No. words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>18</td>
<td>33,633</td>
<td>83</td>
<td>173,412</td>
</tr>
<tr>
<td>Economics</td>
<td>20</td>
<td>38,086</td>
<td>22</td>
<td>52,158</td>
</tr>
<tr>
<td>Engineering</td>
<td>20</td>
<td>35,627</td>
<td>97</td>
<td>203,782</td>
</tr>
</tbody>
</table>

Table 12.2 Textual features per 10,000 words

<table>
<thead>
<tr>
<th></th>
<th>Tables</th>
<th>Figures</th>
<th>Lists</th>
<th>Listlikes</th>
<th>Formulae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Biology</td>
<td>15****</td>
<td>25****</td>
<td>1</td>
<td>4</td>
<td>17****</td>
</tr>
<tr>
<td>Eng-Biology</td>
<td>5</td>
<td>13</td>
<td>2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Chi-Economics</td>
<td>1</td>
<td>14****</td>
<td>2*</td>
<td>25****</td>
<td>42****</td>
</tr>
<tr>
<td>Eng-Economics</td>
<td>0</td>
<td>12</td>
<td>1</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Chi-Engineering</td>
<td>10*</td>
<td>21</td>
<td>7</td>
<td>53****</td>
<td>106****</td>
</tr>
<tr>
<td>Eng-Engineering</td>
<td>7</td>
<td>21</td>
<td>10</td>
<td>24</td>
<td>67</td>
</tr>
</tbody>
</table>

(Statistical differences are shown between student groups within each discipline, using log likelihood, * p<.05; **** p<.0001).

In the BAWE corpus, a “table” is a graphic containing rows and columns while a “figure” covers any graph, diagram or image. A distinction is made between “lists” and “listlikes,” both of which contain bulleted or numbered items, in that the former comprise lists of words or noun/verb phrases, and the latter comprise items in complete sentences and displayed in list format.

Table 12.2 suggests that both disciplinary differences and student group differences exist. Texts in Biology contain the most tables and figures, while Engineering texts contain the most listlikes and formulae. Within the student groups, the majority of categories in the Chinese corpora show significantly greater use of each textual feature than the English corpora. Disciplinary variations in these features are to be expected, since, for example, Biology entails the use of images of natural phenomena and Economics may involve reports with writing in lists, but it is less clear why the student groups should also differ in their usage.

The next stage was to look at these items in the context of whole assignments. Due to limited space, I confine discussion to a pair of assignments by an L1 Chinese student and an L1 British student within Engineering (see Table 12.3). This assignment pair was selected as the texts answer the same question within the same year 2 module at one university, though the spread of textual features appears typical of those across Chi-Engineering and Eng-Engineering.
Table 12.3 Comparison of two Engineering assignments

<table>
<thead>
<tr>
<th>Textual feature</th>
<th>L1 Chinese, 0254g</th>
<th>L1 British, 0329e</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of pages excluding references</td>
<td>11</td>
<td>5.5</td>
</tr>
<tr>
<td>No. of words</td>
<td>1,432</td>
<td>2,064</td>
</tr>
<tr>
<td>No. of tables</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>No. of figures</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>No. of formulae</td>
<td>34</td>
<td>10</td>
</tr>
<tr>
<td>No. of lists</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>No. of listlikes</td>
<td>9</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: The number of formulae for the English text has been altered from the three given in BAWE data to ten, to correct a disparity in tagging.

Each assignment is entitled “centrifugal pump experiment,” and is divided into sections with self-explanatory headings such as “introduction” and “apparatus and methods.” While the Chinese writer begins each section on a new page, the British student simply uses a line break before a new section, resulting in the Chinese writer’s assignment containing double the number of pages yet only two-thirds the word count of the British student’s assignment (Table 12.3).

The differing quantities of formulae and prose are illustrated by page extracts in Figure 12.1. Whereas the Chinese student’s discussion weaves together formulae and prose, the British student’s response is given as a series of short paragraphs.

Throughout the assignment, the Chinese student employs lists to both present data and make substantive points whereas the British student uses discursive prose (Figure 12.2).

The top box of Figure 12.2 shows the Chinese student’s bulleted conclusion, given in complete sentences and stating the bald facts of the experiment:

The experiment yielded the following conclusions:

- The efficiency of a single stage centrifugal pump at high pump speed (3000 RPM) is better than …
- The input power with high pump speed increases …

(Extract from Conclusion, 0254g).

In contrast, the British student’s conclusion is more discursive, introducing the results and relating these to the experiments:

In this investigation into the performance characteristics of a centrifugal pump at different speeds many things were realized. Firstly, it was seen that at the two different speeds the character-
Analysis and Discussion of Results

Figure 12.1 in the Appendix 2 showed the performance characteristics of the centrifugal pump. Firstly, the total head of the pump decreased as the discharge increased, whatever the pump frequency was 2000 RPM or 3000 RPM. The curves of the relationship between total head and discharge were identical between 2000 RPM and 3000 RPM, but the total head of 3000 RPM was much higher than the one with 2000 RPM. Secondly, the efficiency was fluctuant as the discharge increased. Whereas, the efficiency was direct proportional to the discharge for both speed settings when the discharge was less than 0.5 l/s. And for the pump speed of 2000 RPM, the efficiency peaked when the discharge was about 1 l/s, for the pump speed of 3000 RPM, the efficiency peaked when the discharge was about 0.9 l/s. The highest value of efficiency for 3000 RPM was 64%, and the peak efficiency for 2000 RPM was 88 percentages less, which was 46%. Overall, the higher speed pump worked more efficient than lower speed pump. Thirdly, input power was direct proportional to the discharge for both speed settings, but the gradient of the relationship with 3000 RPM was greater than the one with 2000 RPM, it indicated that the input power increased faster with higher pump speed.

Figure 2 in the Appendix 2 showed the relationship among the non-dimensional groups. Firstly, the non-dimensional group \( \frac{Q}{f_{3000}} \) was inverse proportional to the non-dimensional group \( \frac{\Delta P}{f_{3000}^2} \) for both speed settings, and those two linear lines were parallel, but the one with 3000 RPM was 5 units greater than the one with 2000 RPM. Secondly, the non-dimensional group \( \frac{T}{f_{3000}^2} \) decreased as the non-dimensional group \( \frac{\Delta P}{f_{3000}^2} \) increased, the relationship was a curve, those two curves of 3000 RPM and 2000 RPM were identical, but the non-dimensional group \( \frac{T}{f_{3000}^2} \) was greater with higher pump speed.

These three graphs are shown in Appendices 2, 3, and 4 respectively.

Evaluation of Results

When the pump is running at 2000 RPM the performance characteristic, as displayed by Graph 1, are as follows. Efficiency is a parabolic curve in which the maximum value of around 21.5% efficiency occurs at 0.8 litres/sec flow rate. The total head is a linear curve in which the maximum value of total head occurs at 0.8 litres/sec flow rate. The total discharge exists 0.9 litres/sec, at which point the total head starts decreasing at an increasing rate. Input power increases at a constant rate almost throughout.

When the pump is running at 3000 RPM the performance characteristic, as displayed by Graph 2, are as follows. Efficiency is a parabolic curve in which the maximum value of around 21.5% efficiency occurs at 0.8 litres/sec flow rate. The total head is a linear curve in which the maximum value of total head occurs at 0.8 litres/sec flow rate. The total discharge exists 0.9 litres/sec, at which point the total head starts decreasing at an increasing rate. Input power increases at a constant rate almost throughout.

It is now possible to compare performance characteristic for when the pump is running at the two different speeds. At speeds of 3000 RPM the pump has a higher efficiency, total head, and total discharge when compared to 2000 RPM. Efficiency decreases at an increasing rate. Total head decreases at an increasing rate. However, it is fairly linear between 0.5 litres/sec and 0.9 litres/sec flow rate. Input power increases at a constant rate almost throughout.

In order to analyse Graph 3, which displays the 'Non-dimensional results', we can consider that the non-dimensional results represent coefficients of the variables within them, and therefore the non-dimensional results change in proportion to the variables, as discussed below.

decrease at an almost constant rate. This is because delivery pressure is the variable that is charged at a constant rate during the experiment. The only other variable is the equation, which shows the suction pressure. The suction pressure also changes at a constant rate. This non-dimensional will therefore change at a constant rate because it changes at a constant rate.

increases at a decreasing rate. This is because discharge, Q, increases at a decreasing rate.

increases at a decreasing rate. This is because flow rate increases at a decreasing rate, which means that torque, T, increases at a decreasing rate.

There are some possible sources of random error in this experiment, which may account for any conclusion within the data. Firstly, due to the lack that
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**Conclusions**

The experiment yielded the following conclusions:

- The efficiency of a single stage centrifugal pump at high pump speed (3000 RPM) is better than 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.

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**0254g (L1 Chinese)**

In this investigation into the performance characteristics of a centrifugal pump at different speeds many things were realised. Firstly, it was seen that at the two different speeds the characteristics were very similar. They were similar due to the forms and gradients of the graphs being very close to one another. However, small differences still existed such as the spread of the results and slight variations in gradient, such as with input power in Graphs 1 and 2, where for Graph 2 it has a slightly steeper gradient than in Graph 1. It was also discovered that the pump would run up to 8% more efficiently at 3000rpm than at 2000rpm.

Secondly, it was seen that in Graph 3, for the non-dimensional results, if speed were to be increased then and would theoretically move closer together.

It can be seen that this sort of investigation into centrifugal pump performance characteristics is extremely useful in analysing how well a pump will work in certain situations. The graphs derived would be invaluable in a situation where you had to pick a pump to be used in a system. For example, you could use them to determine what speed and power intake you would need in order to get a particular discharge. Overall, the techniques used in this investigation and their results are a versatile tool in analysing the performance of pumps.

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**0329e (L1 English)**

Figure 12.2: Conclusions

istics were very similar. They were similar due to the ... (Extract from Conclusion, 0329j)

Since both texts have been judged as proficient by the discipline lecturers, (i.e., awarded at least a merit), it seems reasonable to conclude that different combinations and proportions of textual features are acceptable. Similar studies of assignment pairs in Biology and Economics revealed wide variation of the use of images and lengthy captions in the former and of lists and listlikes in the latter (Leedham, 2015) (see also work by Arlene Archer, 2006, on South African students of Engineering using both visual and textual semiotic resources).

It is difficult to speculate, however, as to the preferred characteristics of student writing in particular disciplines, and the next section draws on discipline lecturers’ views of valued features.

**INTERVIEWS WITH LECTURERS**

Overall, the interviews conducted for the BAWE project indicate that “proficiency” in writing for discipline lecturers relates to a range of criteria, including
(but not limited to) linguistic proficiency, understanding of content, presentation, clarity, concision, integration of graphics and careful referencing. While a broad consensus may be agreed on at university, discipline or department level, an academic literacies perspective entails recognition that the precise balance of acceptable features may in fact differ from lecturer to lecturer and even from one assignment to another. Part of the task of the student writer is thus attempting “to unpack the ground rules of writing in any particular context” (Lea, 2004).

The rest of this section briefly examines interview comments relating to brevity, use of visuals, and lists in Biology, Economics and Engineering interviews (n=11).

- **Being concise:** In Biology, a lecturer commented that “there’s never been a penalty for an essay that’s too short”; similarly, in Economics one lecturer outlined their preference for “precision, incision, concision.” Engineering lecturers valued the ability to be “clear and concise,” “succinct,” and point to a dislike of “verbosity.” The integration of formulae and prose in discussion and the bulleted conclusion of the Chinese student’s text clearly adhere to these values (Figures 12.1 and 12.2).

- **Employing visuals:** In Biology, it was suggested that a lab report of five or six pages should include diagrams, highlighting the visual nature of the discipline (e.g., John Dinolfo, Barbara Hefferon, & Lesly Temesvari, 2007). A “typical” essay in Economics was said to contain both diagrams and formulae “as the spine of the essay.” In Engineering, meanwhile, marks for presentation may include the assessment of diagrams, tables and overall layout. The corpus data presented in Table 12.2 points to a greater use of visual features by Chinese students in the three disciplines.

- **Writing in lists:** Few lecturers mentioned list writing, since the interviews were conducted without reference to individual student texts. One Economics lecturer stated a dislike of written work containing “just diagrams and incomplete notes” rather than complete sentences. An Engineering lecturer similarly remarked that he disliked the use of bullet points as a space-saving feature, perhaps viewing these as a way of circumventing the occasional setting of page (as well as word) limits. However, in the assignment pair considered earlier, the list is a bulleted “listlike” (i.e., contains complete sentences) so may be more positively viewed as an aid to concision and clarity in the writing rather than a means of meeting word limits.

**IMPLICATIONS FOR PRACTICE**

This chapter has argued that, for the disciplines investigated, it is acceptable for students to integrate visuals, formulae and lists in addition to or instead of limiting
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responses to connected prose. While studies such as this one can explore the range of textual features used in successful undergraduate assessed writing, it is not possible to give highly specific guidance since lecturers in different contexts are likely to vary in their views on the nature of good writing in particular assignments (Lea & Street, 1998). Given that EAP tutors frequently have a background in the more discursive subjects within Arts and Humanities and may be unfamiliar with writing practices in other disciplines, this section offers suggestions as to how tutors can increase their awareness of the diversity of undergraduate student writing, and thus assist students in becoming more effective writers.

Concrete means of establishing the range of acceptability in a discipline include exploring corpora (such as BAWE) and analyzing assignment exemplars of the genres their students are asked to produce. Stronger links with the local context would also enable EAP tutors to better understand discipline lecturers’ expectations. However, more fundamental to any transformation in EAP tutors’ views are reflexivity in exploring the “taken-for-granted” procedures and practices (Lillis, 2012, p. 245) and a flexible attitude in considering what might be acceptable within unfamiliar disciplines and genres. This open-mindedness moves beyond lexico-grammatical considerations (e.g., the acceptability of “I” or the choice of passive/active voice) to exploring assignments holistically and multimodally (Is it ok to use a table to display results? Can the conclusion be presented as a bulleted list?). Breadth of vision allows tutors to recognize different ways of achieving the same end goal in writing, as with the two Engineering texts, and to embrace the different cultural backgrounds L2 English students bring to their studies.

Possibilities for transformation occur at all levels, from student to professional, covering linguistic aspects and beyond: in her report on an interview study of L2 English scholars, Tang (2012a, p. 210) discusses the potential of university scholars from diverse linguistic and cultural backgrounds to “enrich the discussions in their disciplines.” While recognizing that L2 English writers have to learn the rules of the writing “game” (Christine Casanave, 2002), Tang proposes that increasing participation of these scholars may “result in an opening up of the community mindset to allow for different kinds of norms to be deemed viable” (p. 224-225). Thus aspects of the writing in a community are “likely to shape the future practices of that community” (p. 225).

Discipline tutors can assist in the process of change by continuing to embrace different ways of carrying out the same task, rather than adhering to a UK NS “normative pedagogic imperative” (Lillis, 2012, p. 240) and by recognizing that both NS and NNS undergraduate students need help in understanding what is expected in assignments. This guidance could take the form of exemplars and accompanying commentary to illustrate possible assignment responses, and allowing dedicated time within lectures for discussion of their expectations. Discipline lecturers could also work with EAP tutors to jointly understand the needs of all students and to
more precisely articulate the difficulties which different groups may face.

This chapter has challenged the common approach within corpus linguistics research of NNS student writing as in some way deficient when compared to NS or to “expert” writing, arguing that the Chinese students’ significantly higher use of visuals, formulae and lists function as different, yet equally valued, ways of achieving success at undergraduate level. A more rounded perspective than can be found through corpus studies alone has been obtained through the combination of corpus linguistics with close study of textual features in two assignments and the emic perspective offered by lecturers. An Academic Literacies approach has much to offer since this views learning how to write in the preferred ways of a specific situational context (e.g., a particular assignment set by an individual lecturer within their university department at one point in time) as a challenge for both NNS and NS university students, and recognizes that this may be accomplished in varying ways (Archer, 2006; Lillis, 2012) (see also Ute Römer’s 2009 discussion of how both NS and NNS have to develop their competence in academic writing). For both EAP tutors and discipline lecturers, then, a transformation within teaching can come about through recognizing the importance of our own academic and cultural backgrounds in shaping beliefs, and through questioning our assumptions as to the nature of “good” student writing. Academic Literacies can assist here in providing the theorization behind such a transformation and in guiding us towards more diverse ways of viewing good writing, with the result that NNS writers are viewed not in terms of deficit but in terms of what they can bring to the academy (Tang, 2012a).

NOTES

1. In this paper I have, for convenience and brevity, used the terms “NS” and “NNS” while recognizing that these are contentious (see Leung, Harris & Rampton, 1997). The “L1 Chinese” group refers to students who speak any dialect of Chinese and who lived in a Chinese-speaking environment for all or most of their secondary education. “L1 English” denotes students whose self-proclaimed L1 is English and who lived in the United Kingdom for all or most of their secondary schooling.

2. The data in this study come from the British Academic Written English (BAWE) corpus, which was developed at the Universities of Warwick, Reading and Oxford Brookes under the directorship of Hilary Nesi and Sheena Gardner (formerly of the Centre for Applied Linguistics [previously called CELTE], Warwick), Paul Thompson (formerly of the Department of Applied Linguistics, Reading) and Paul Wickens (Westminster Institute of Education, Oxford Brookes), with funding from the ESRC (RES-000-23-0800).
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