Write on the Edge: Using DDL to support students writing in unfamiliar genres

Megan Bruce
Director of Combined Honours, Durham University
Outline

• Project background
  • Why DDL?

• FOCUS corpus

• Write on the Edge
  • Chemistry
  • Sport
  • PGCE

• Next steps
Project background

• Introduction of EAP modules in Foundation Centre curriculum to support non-traditional learners (mature, WP) to prepare for degree level study.
• Quickly discovered that Foundation students didn’t respond well to EAP methods which had been successful with NNS.
• DDL was a better fit.
The FOCUS (Foundation Corpus) project began in 2012;

Grew from a need to support Foundation students’ academic language development;

Now being used not only in the Foundation Centre but in other Durham departments and elsewhere.
FOCUS rationale: why did we build a corpus?

• Students lack awareness of how best to learn new subject-specific vocabulary;

• Students have confidence issues related to overt teaching of grammar;

• Students needed to develop good self-study skills;

• Students wanted self-access materials to use for revision.

• These issues are also transferable to other contexts: hence rollout to other departments.
The FOCUS project

- A corpus of “good” (2:1 or above) Durham student writings produced by UG/PG students across an increasingly broad range of disciplines e.g. Chemistry, Earth Sciences, Sociology, History, Sport, Education, Criminology, Physics, Business, Theology.

- Bespoke concordancer with deliberately simple interface.

- It now contains well over 1 million words and figures.

- Developing concordancing activities based on these corpora to allow students to discover more about target vocabulary/structures in context.

- Supported by HEA, RSC and Durham University funding.
# FOCUS screen shot 1

<table>
<thead>
<tr>
<th>Before</th>
<th>=&gt; After</th>
<th>Level</th>
<th>Type</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>would give strong binding ability for a drug</td>
<td>molecule.</td>
<td>1</td>
<td>This model of gp41 in different conformations</td>
<td>M</td>
</tr>
<tr>
<td>absorption cross-section of the molecule (m²)</td>
<td>molecule.</td>
<td>1</td>
<td>is the particle density (molecule m⁻³)</td>
<td>PhD</td>
</tr>
<tr>
<td>ortional to the surface area of the dissolved</td>
<td>molecule.</td>
<td>1</td>
<td>The energetic contribution to dissolving</td>
<td>PhD</td>
</tr>
<tr>
<td>understanding of the torsional motions of the</td>
<td>molecule.</td>
<td>1</td>
<td>The UV absorption spectrum of BPEB at room</td>
<td>PhD</td>
</tr>
<tr>
<td>12). This eliminates the rest of the E13SiOTI</td>
<td>molecule</td>
<td>1</td>
<td>The newly formed, charged, NIS derivat</td>
<td>3</td>
</tr>
<tr>
<td>3 (a) Diagram to show structure of a sucrose</td>
<td>molecule</td>
<td>(Chemistry Daily 2005) Iodine dissolved only</td>
<td>0</td>
<td>Lab rep</td>
</tr>
<tr>
<td>g the bond angle and bond length of a water</td>
<td>molecule</td>
<td>(left) and a dot and cross diagram illustrati</td>
<td>1</td>
<td>Essay</td>
</tr>
</tbody>
</table>
FOCUS screen shot 2: collocation

- Electron flow. This electron comes from a water molecule, resulting in the photolysis of water into hydrogen and oxygen. [1 Essay CHEM]
- A red and this is called non-polar. In a water molecule, where the pull of the oxygen is stronger than that of hydrogen. [0 Lab rep CHEM]
- When heavy water was used, that is a water molecule containing an atom of 18O the oxygen product. [1 Essay CHEM]
- The H-O-H bond angle and bond length of a water molecule are 104.474 and 0.95718 Å respectively. The g the bond angle and bond length of a water molecule (left) and a dot and cross diagram illustrating the bond angles and lengths. [1 Essay CHEM]
- Candy has enough energy to break up a water molecule so the hole can be filled by other electrons. [1 Essay CHEM]
- Water nucleophilic attack, in which a water molecule from the solvent attacks an electrophilic oxo group. [3 Diss CHEM]
- Triglycerol 9 by the removal of another water molecule, and so on until the desired level of polymer. [3 Diss CHEM]
- Persistent with displacement of one bound water molecule. Bicarbonate binding to a europium complex. [PhD Diss CHEM]
- The average number of hydrogen bonds per water molecule will be a good quantitative measure of structure. [3 Diss CHEM]
- Ions are then H+ Hydrogen ion from the water molecule. Equation to show Sodium Chloride reaction. [0 Essay CHEM]
- Depicts the offset position of the water molecule compared to the hydroxyl and amine functions. [3 Diss CHEM]
- Air portion so the overall effect on the whole molecule of the polar portion is negligible and the molecule. [0 Lab rep CHEM]
FOCUS screen shot 3: word cloud
**FOCUS screen shot 4: wildcard %**

<table>
<thead>
<tr>
<th>Ion is now used to power 17.1% of the world's energy &amp;c.</th>
<th>electricity,</th>
<th>1</th>
<th>Essay</th>
<th>CHEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2) but few power stations have been built sofar...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uniques [13], which possess added interfacial...</td>
<td>specificity</td>
<td>PhD</td>
<td>Diss</td>
<td>CHEM</td>
</tr>
<tr>
<td>mechanical properties, cost, availability and...</td>
<td>toxicity</td>
<td>PhD</td>
<td>Diss</td>
<td>CHEM</td>
</tr>
<tr>
<td>locations, with benefits also for solubility and...</td>
<td>toxicity</td>
<td>PhD</td>
<td>Diss</td>
<td>CHEM</td>
</tr>
<tr>
<td>it had a low melting point and did not conduct...</td>
<td>electricity</td>
<td>0</td>
<td>Lab rep</td>
<td>CHEM</td>
</tr>
<tr>
<td>secondary amine functional group enhances the...</td>
<td>nucleophilicity</td>
<td>PhD</td>
<td>Diss</td>
<td>CHEM</td>
</tr>
<tr>
<td>electron parts of molecules or structures. This...</td>
<td>specificity</td>
<td>M</td>
<td>Diss</td>
<td>CHEM</td>
</tr>
<tr>
<td>for many systems involving biocompatibility,...</td>
<td>lubricity</td>
<td>PhD</td>
<td>Diss</td>
<td>CHEM</td>
</tr>
<tr>
<td>others have been replaced to alter the structure,</td>
<td>hydrophobicity</td>
<td>PhD</td>
<td>Diss</td>
<td>CHEM</td>
</tr>
<tr>
<td>bonded together covalently. They do not conduct...</td>
<td>electricity</td>
<td>0</td>
<td>Lab rep</td>
<td>CHEM</td>
</tr>
</tbody>
</table>
Data Driven Learning

A learning situation where “the language learner is also, essentially, a research worker whose learning needs to be driven by access to linguistic data – hence the term data-driven learning (DDL)” (Johns 1991:2).

The learner uses data to uncover the rules behind the language while the teacher “provides a context in which the learner can develop strategies for discovery” (ibid).

Helps to develop criticality which is a crucial element of learning skills. Moves away from “single correct answer” towards understanding importance of patterns, alternatives and context. (Gabrielatos 2005)
Write on the Edge project

- Supporting students writing in unfamiliar genres:
  - Chemistry finalists writing dissertations (extended text)
    - Online prelab
    - Live workshop developed by FOCUS team but delivered by Chemistry team
  - Sports students writing lab reports (often without science A Levels)
    - Live workshop in pilot year
    - Online activities will be accessible next year
  - Education (PGCE) students writing reflections
    - Live workshops
    - Online activities
Online prelab diagnostic quiz and academic voice

Chemistry activities

1.1. Introduction
You can see lots of colours in the objects that surround you every day. These colours are in things like a bit of a new building, a very old work of art or really REALLY old Egyptian funerary wall paintings. Loads of this colour around us is a consequence of the pigments used to make things which have been found to originate as far back as prehistoric ages prettier. For you to figure out how old these objects are, you have to use analytical methods that can show you what pigments are present.

1.2. Definitions
You can characterise pigments as either organic or inorganic, depending on the elements they contain. Organic pigments are kind of mostly carbon containing compounds, typically with a delocalised system of electrons being responsible for their colour. The part of the compound responsible for colour is known as the chromophore. On the other hand, inorganic pigments are non-carbon based and often contain transition metals or other metals.

You can create admixtures of pigments where the hue of a primary pigment is changed by mixture with other minerals. This can be detected in the spectrum produced by an analytical method. When you look at really old things like paintings, you have to be really careful not to damage them, so you can't touch them or anything. Don't examine them in day light – you must be in a really dark room. Otherwise, do you know what will happen?

Proving that an artwork is a knock off using pigmentation is also a really amazing thing to do. After all, you don't want to pay loads of money for a fake, do you?

Live workshop focusing on:

- Reporting verbs
- Nominalisation
- Connectives
- Punctuation
“Nominalisation was new to me and a skill/tool I would like to develop to give me the right tone.”

“[I would use it] to see if certain words I write are academically acceptable.”

“It allows me to compare the language I am using to previous work that has received a good mark. This is useful.”

“Useful to check whether [a] chosen word is common in dissertation[s].”
Chart showing student responses to the question “How useful did you find the activities?”
Would you be likely to access the corpus yourself outside the classroom?
Write on the edge: using a chemistry corpus to develop academic writing skills resources for undergraduate chemists

M. L. Bruce,*a P. K. Coffer,†b S. Reesa and J. M. Robson*b
Sport: Physiology lab reports

• Sport students needed help to produce a lab report as they don’t usually have science A Levels and so no experience of this genre

• Based on issues we identified in the formative lab reports, the workshop that we ran to help students prepare for their summatives focused on the following areas:
  • Formality
  • Use of literature
  • Nominalisation
  • Scientific terminology
Corpus used to improve understanding of key subject specific terminology. Use and meanings of words explored in context e.g. *saturated*, *contractility*. Common roots of words explored e.g. lactate, lactic acid, alactate

| Imited (152). 2.5 PREVENTION OF UTI 2.5.1.1 | Prophylactic | antibiotics Opinions differ on when to start |
| Systems dominant in rugby as 60% aerobic, 30% | lactic | acid and 10% alactic energy systems (Bompa an |
| Rugby ergogenesis as using; 10% Alactic, 30% | Lactic | acid and 60% Aerobic energy systems. Maximal |
| Are often characterized by 20-to 40-membered | lactone | rings, contain six conjugated carbon-carbon d |
| D exertion using the Borg scale (Borg, 1982), | lactate | accumulation (until is 4mmol surpassed) and e |
| Ring the nursing period (Haller et al. 1996). | Lactation | is a little more intense) for these pups, b |
| Such as lactic acid (McArdle et al., 2001). | Lactic | acid inhibits muscular performance as the blo |
| Lactic | Lactic | it is produced in fast-twitch muscle fibres |
| Lactate | Lactate | threshold is the work load at which blood la |
| Lactate | Lactate | threshold represents the maximum oxygen uptak |
| In cell wall biosynthesis (transpeptidase) | lactation) | . Bell et al. (2009) conducted a meta-analysis |
| Lactones/Lactides. Carbonates | lactation) | undertaken during the breeding period (Twiss |
| Lactamase | -lactamase | Mutations in PBP.s Active efflux Staphylococ |
| Lactams | Lactams | . Siloxanes |
| Chemical shift imaging (CSI) studies of the | -galactosidase- | catalysed reaction in transfected cancer cell |
| Catalysing the reaction of pyrrolidine with | -crotonolactone | 5 and 6 offered a relative rate increase of |
Feedback - Sport

“We have noted a distinct improvement in the quality of students’ use of language within level one assessment, and plan to extend the corpus to support additional disciplines within our undergraduate programme. We are delighted with the learning outcomes of the FOCUS project which is a key element of our student support for HE transitioning!”

(Dr Sue Bock, Director of Education, Department of Sport, Durham University)
Self-directed study assignment: lit review plus reflection
Many PGCE students lacked a traditional academic background: questionnaire data showed that they lacked confidence in PG level writing.
We designed three online activities based on analysis of the assignments and feedback from markers. 100% of the students evaluated the activities as “very useful” or “quite useful”:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Very Useful (%)</th>
<th>Quite Useful (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure/Referencing</td>
<td>78.57</td>
<td>21.43</td>
</tr>
<tr>
<td>Criticality</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Reflective Practice</td>
<td>53.85</td>
<td>46.15</td>
</tr>
</tbody>
</table>
Feedback - PGCE

Students commented that:

“This is a great resource and very helpful for someone like me that is returning to Education after a long break (and a lot of technological advances).”

“Really useful. I hope it stays open throughout the year so I can refer back to it for all assignments.”

We are holding focus groups to evaluate activities further now that the academic year is complete.
Next steps

• Evaluate student and lecturer feedback of the SDS assignment to inform future changes

• Integrate FOCUS into new Critical Scholarship in Social Sciences module to support CH students in understanding disciplinary differences.
References


