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Developing a framework for coding English students' spelling errors

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General description on research questions, objectives and theoretical framework

Spelling is problematic in English. Fischer, Shankweiler & Liberman (1985) state that "...English spelling is not easily mastered. Even accomplished readers and writers may at times be uncertain about the spelling of particular words" (p423). Whilst the English alphabet contains 26 letters, the spoken language contains 44 different phonemes. This means that a letter can be pronounced in multiple ways, whilst a single sound can be written using different combinations of letters.

Such complexity means that students are taught how to spell through carefully structured programmes. The English programmes of study from the National Curriculum (DfE, 2013a) contain detailed descriptions of the letter patterns, words, and spelling rules that students should be taught during primary education. Students sit compulsory spelling tests at the end of primary school education (age 11). Secondary school students are expected to know and apply these patterns and rules (DfE, 2013b), and in some General Certificate of Secondary Education (GCSE) examinations (age 16) they are encouraged to spell accurately through the awarding of marks for spelling accuracy (Ofqual, 2014). Despite this, students in England still struggle to spell accurately. Elliott et al (2016) found that 16-year-old students at every level of attainment make spelling errors in their writing, although the lower achieving students make many more errors than the higher achieving students do.

In order to help students to spell accurately, both students and teachers need to be aware of the causes of their spelling errors. Analysis of the errors the students make can help with this. Researchers have investigated the cause of errors using two methods: analysing the errors made on spelling tests, or identifying errors made in students' writing (Brooks, Gorman & Kendall, 1993). Spelling tests allow detailed analyses of students' spelling for particular words, looking at concepts such as phoneme-grapheme correspondence or knowledge of spelling rules. Samples of students work provide a better overview of the errors made in natural writing, showing the frequency of students' errors, and enabling an estimation of the degree to which the errors inhibit meaning (Bebout, 1985).

Several methods have been developed for analysing spelling errors. Some researchers, such as Bruck and Waters (1988) and Bebout (1985), have categorised the phonetic errors that were made. Others, such as Brooks et al (1993) and Elliott and Johnson (2008) have included particular spelling rules and letter patterns too.

Elliott and Johnson's (ibid) categories related the errors to spelling conventions. They identified misspelt words in random stratified samples of single sentences taken from 16-year-old students' narrative writing in an English examination, and grouped them into five categories and 22 sub-categories of spelling errors. The precision of their categories, along with the similarity of their sample, meant that their method was considered the most appropriate for this study.

Whilst Elliott and Johnson's (ibid) categorisation provided an interesting insight into the errors made in one examination, it proved difficult to use in its original form. The placement of words into categories depended upon human judgement and it was difficult to be consistent in allocations. Therefore, the first objective of this study was to develop a method for transforming their categories into a method that could be used to categorise spelling errors in larger samples of writing. The second objective was to use the new method to code samples from different years to see whether the proportion of errors attributed to each

category by Elliott and Johnson (ibid) represented the proportions seen in a larger sample of writing. This would show whether their framework could be applied to different samples, for example English as a second language students, or students of different ages.

Method

Initially, Elliott and Johnson's (ibid) framework was used to attempt to code a small sample of words from a 2014 examination task. This task proved to be almost impossible, as it was difficult to be consistent with decisions about placing words that appeared in multiple categories. Therefore, a method for identifying the source of error was developed.

First, overlaps between the categories and sub-categories within Elliott & Johnson's framework were identified. Most of the overlaps occurred with the phoneme-grapheme mismatch sub-category, which overlapped with sub-categories including *homophones*, and *single letter omitted*. When the overlaps had been ascertained, the most precise of the overlapping categories were identified. Then a flow chart was developed to show where individual words should be placed. This was tested with Elliott and Johnsons' (ibid) words to see whether it led to consistent categorisation. In most instances, the words were placed in the same categories. Where differences occurred, the researchers agreed either that the new category was more precise and the flowchart should remain unchanged, or the order of the flowchart was altered to enable the correct category to be assigned. After this process, the only judgement required was when identifying words which should be placed into the *pseudo-phonetic* and *extreme phonetic errors* sub-categories.

In order to see whether the framework could be used with a wider sample of writing, the study used 100-word extracts taken from examinations of 16-year-olds' writing in 2004, 2007 and 2014. Eight grades were available on the examination (A*-G), and samples were taken from 30 male and 30 female students at each grade. Fewer scripts were sampled at grade G, where there was a lack of sufficiently lengthy scripts. Each extract consisted of 100 words (as written by student) starting from the fourth grammatical sentence.

Each researcher initially identified the spelling errors in half of the sample. The samples were then exchanged to allow verification of the misspelt words. Any words with could not clearly be identified as correctly spelt or incorrectly spelt were discussed before being classified.

Students were given the benefit of the doubt for ambiguous letters, and any grammatical errors that produced correctly spelt words were ignored. Once the samples were prepared, all the errors in every misspelt word were coded using the flowchart. The resulting codes were used to see whether the proportion of errors in each category and sub-category were similar across years.

Expected outcomes

The flowchart was used to code all the words from the 2004, 2007 and 2014 samples. All the words could be placed in one of the sub-categories, and (with the exception of the two sub-categories mentioned above), none of the errors required extra judgement to be placed into a category. Whilst the words were being coded, several further groups of errors were identified. This led to the creation of eleven additional sub-categories. The flowchart was amended to include the additional sub-categories.

The flowchart allows possible sources of spelling error to be identified. It can be used for English as a second language speakers as well as native English speakers, since many of the identified categories relate to spelling rules and conventions that they need to learn.

Findings from all three years will be presented, and any similarities and differences in the errors will be explored. Initial analyses of the 2007 and 2014 spelling errors suggest that the proportion of errors allocated to each of the main categories is similar in the two years.

The analysis of the spelling errors made in 2004, 2007 and 2014 enables teachers in England to reflect upon their teaching of spelling, and to see which types of spelling errors need more emphasis. It will also allow teachers and researchers interested in English as a second language to consider whether the errors affect their students too.

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