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An Exploration of University Students' Spelling Abilities

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Abstract

This study includes a spelling inventory and attitude survey that were administered to pre-service education undergraduates. Analyzed using traditional performance levels as guidelines, no students scored at an independent level, 71% scored within an instructional level, and 29% scored at a frustration level. Inventory results and survey comments demonstrated the students' heavy reliance on letter/ sound correspondences to guide their attempts at spelling. The majority commented that, as a teacher, they would help struggling spellers by telling them to "sound out the word." Results suggest that, as future teachers, pre-service students must be instructed beyond the alphabetic stage and shown how to explore the pattern and meaning layers of English.



An Exploration of University Students' Spelling Abilities

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Abstract

This study includes a spelling inventory and attitude survey that were administered to pre-service education undergraduates. Analyzed using traditional performance levels as guidelines, no students scored at an independent level, 71% scored within an instructional level, and 29% scored at a frustration level. Inventory results and survey comments demonstrated the students' heavy reliance on letter/sound correspondences to guide their attempts at spelling. The majority commented that, as a teacher, they would help struggling spellers by telling them to "sound out the word." Results suggest that, as future teachers, pre-service students must be instructed beyond the alphabetic stage and shown how to explore the pattern and meaning layers of English.

Research on various aspects of children's spelling development spans decades of inquiry (Allal, 1997; Bear, Invernizzi, Templeton, & Johnston, 2004; Beers & Henderson, 1977; Fresch, 2005; Fresch, 2000; Henderson, 1985; Perfetti, Rieben, & Fayol, 1997; Read, 1971; Templeton & Morris, 2000; Zutell, 1979). Stages or phases of spelling development progress as students' experiences and knowledge of English orthography increase. Each stage has identified characteristics of development that lie along a continuum and individual development of understandings about the language occurs at different rates. Some children move along quickly, using reading and writing instruction to inform spelling development (Bear, et al., 2004; Zutell & Rasinski, 1989) while others struggle depending on a variety of issues including instructional approach (Gill & Scharer, 1996; Morris, Blanton, Blanton, & Perney, 1995) and individual experiences such as vocabulary development (Zutell

& Rasinski, 1989). “The evidence that adult learners do follow a developmental pattern of spelling acquisition and that this pattern is very similar to that of children is important for the planning of assessment and instruction” (Viise, 1996, p. 577).

Without a doubt, lexical knowledge amassed by reading experiences influences adult spellers’ performance. Writers may attempt to spell a word based on a known spelling pattern, or rule, and then access their lexical knowledge to proof-read the attempt (Burt & Fury, 2000). While the importance of adult reading experiences cannot be underestimated, the need for phonological and morphological knowledge is apparent (Burt & Fury, 2000; Shankweiler, Lundquist, Dreyer, & Dickinson, 1996). “It is accepted by most developmental researchers that deficits in phonological processing are fundamental impairments of children’s reading and spelling development” (Burt & Fury, 2000, p. 5). Hughes and Searle (1997) argue that one must continue developing to move beyond phonological processing. The speller must “work consciously to understand, master, and integrate the various logics that together constitute English: sound, look, and syntactic and semantic meaning. We cannot overemphasize the importance of this change in thinking about spelling to the long-term development of spelling ability” (Hughes & Searle, 1997, p. 30). Research has demonstrated that gaps in this continuum of development may continue to trouble spellers later in life (Bennett-Kastor, 2004; Holmes & Castle, 2001; Holmes & Malone, 2004; Schlagal, 1992).

While research on adult spellers does exist (Hanlon & Cantrell, 1999; Krashen, 1993; Massengill, 2006; Viise, 1996), authors of these studies generally work with spelling challenged adults. As researchers provide experiences in developing spelling knowledge, they must first acknowledge attitudes, such as embarrassment and frustration, of the research subjects acknowledging that issues of self-concept can interfere with adults’ attempts to learn new spelling strategies (Massengill, 2006). Ideally, being aware of the attitudes of adults provides guidance in designing instruction. Chandler (2000) used data from student surveys to drive her redesign of spelling instruction at the secondary level. Her exploration of the students’ knowledge and attitudes about spelling provided direction in helping to improve their writing skills. Chandler (2000) states, “when we hold secondary students accountable for poor spelling but do not provide any deliberate instruction regarding how to become better spellers, we abdicate our absolutely essential responsibility to help all writers in our care move forward from wherever they may be in their development” (p. 94).

Current Study

This study is a preliminary step in recognizing the needs of adult spellers in a university setting. The participants of this study have a pending, important role in society as they are education majors. As pre-service teachers, they are key to future generations of literate adults. Recognizing their skills and attitudes about spelling is essential to their development as teachers and surveying them provides guidance for spelling instruction that may be needed before they become in-service teachers. The questions for the study were:

- How well do adult students perform on an inventory of age-appropriate spelling patterns?
- What are adult students' perceptions of themselves as spellers?
- What strategies do adult students claim to use when spelling unknown words and are these demonstrated in their inventory performance?

Methodology

Participants

Participants were seventeen students enrolled in *Writing Course in the Elementary Education Major*, a required part of the education major at a large mid-western university. All students were either junior or senior status in the undergraduate, non-certifying program as a graduate degree program provides methods courses to meet the requirements for state licensing. Students who complete their undergraduate degree and then apply for the Masters of Education program must have a 3.0 grade point average to qualify. The selection of this one class was based on availability of a content related course (writing) for only education majors, the instructor's willingness to include the research as part of her course with undergraduates, and the fact that the course is offered by her once a year. Considered by the instructor and myself as an exploratory study, the results will guide our future research and course content.

Students were given a spelling inventory of 25 words (See Table 1). Following the inventory, the students completed a survey of eight questions regarding their attitudes about spelling (See Table 2). Thirteen students provided their age, which ranged from 21 to 50, with a mean age of 24. Two respondents were male, 15 were female.

Table 1. Spelling inventory

Word	Target spelling feature	Feature score
poignant	Diphthong	3
premonition	Prefix, suffix	4
commiserate	Doubling consonant as syllable juncture	4
conspiracy	Vowel alternation	3
designation	Consonant alternation	4
irascible	-ible, -able variations	4
irreplaceable	Absorbed/assimilated prefix	4
digresses	Plurals	3
credence	Derivations	2
earring	Compound word	2
cymbal	Homonym	2
bombard	Consonant alternation	2
partisan	Vowel alternation	3
illicit	Absorbed/assimilated prefix	3
illegible	-ible, -able variations	3
metacognition	Prefix	4
epiphanies	Plurals	4
their	High frequency	1
matriarch	Derivations	3
efficacy	Changing consonant sound (/k/, /s/)	4
therefore	Compound word	2
annoyance	Diphthong	3
plausible	-ible, -able variations	2
condemn	Silent consonants	2
judgment	Suffix	2

Table 2. Survey

1. Do you think of yourself as a good speller? Why or why not?
2. How did you learn to spell?
3. As a young person, when you had questions about how to spell a word, what advice were you given? Was this advice helpful? Do you still use that advice today? Why or why not?
4. As an adult, when you are writing and come to something that you can't spell, what do you do?
5. Who is a good speller that you know?
6. What makes this person a good speller?
7. If you knew someone was having trouble with spelling, how would you help?
8. What would you like to do better as a speller?

The Spelling Inventory

To gain information regarding students' spelling abilities, an inventory was designed to observe "on the run" strategies, or attempts made without assistance of Spell Check or a dictionary. The inventory (See Table 1 for words and features) was based on work by researchers of older students that delineate the word features with which mature spellers should be familiar (Bear, et al., 2004; Fresch, 2002; Goodman, Watson & Burke, 2005; Templeton, 1983; Westwood, 1999). Words were selected to fit these spelling features with some of the words being chosen for their appearance in current assigned readings and high frequency use in college level work. For instance, in education courses, terms such as *efficacy*, *metacognition*, and *illegible* often appear in assigned readings. Current event discussions include *partisan*, *judgment*, and *irreplaceable*. The words were pronounced, used in a sentence to provide context, and repeated. The entire list was reread, and any students requesting a repeated word could also hear the context sentence again.

The Survey

The Burke Reading Interview (Goodman, et al., 2005) was used as a framework for developing the survey questions with the questions based on spelling rather than reading. The eight questions were designed with the help of the writing course instructor (See Table 2). Both the instructor and I had vested interests in understanding the skills and attitudes of these students. As the instructor for several of the graduate level reading methods courses, I wanted to be certain we both addressed these students' needs before their student teaching experience. In particular, I am responsible for a phonics course the students take during one of their three quarters of method courses. Consequently, information gathered in the survey and performance on the spelling inventory could help with future instructional planning for the phonics course. The instructor of the writing course voiced a concern similar to Chandler (2000) knowing that simply marking their incorrect spellings does little to instruct. Her desire was to provide more informed comments when evaluating students' written assignments. Number four of the survey asked students, "As an adult, when you are writing and come to something that you can't spell, what do you do?" Responses to this question could then be compared to the observable performance on the inventory.

Data Analysis

Two sets of criteria were used to score the inventories. First, a student was given a quantitative score for percent correct and this percentage identified each respondent's level of performance. Using traditional guidelines (Henderson, 1985) for distinguishing levels, any student scoring 50% or less was considered to be operating in the frustration range, between 50% and 80% as instructional range, and above 80% as independent range (cf. Morris, Nelson, & Perney, 1986).

Second, a qualitative score reflected specific differences in types of spelling errors made by students. A number of scoring guides exist similar to the one used in this study (Morris, et al., 1986; Shankweiler, et al., 1996; Worthy & Viise, 1996). These guides assign a numeric value to a spelling feature within a word. However, these tend to target only one feature in each word. For example, a word targeted for an assimilated prefix such as in *irreplaceable*, would be scored one point if the "irr" is correct, regardless if the speller chose to spell the word *irreplacible*. To provide a broader picture of the speller's strategies, multiple features were analyzed as a feature analysis score was created for each word, depending on the patterns

it contained (Bear, et al., 2004). *Irreplaceable* contains an assimilated prefix (*ir*), a root word (*replace*), retention of the “e” to maintain the “soft” sound of “c” when adding a suffix beginning with “l”, and a suffix (*-able*). One point was awarded for each correct feature in the student’s attempt, so *irreplaceable* was worth four points. The scoring points are provided next to the inventory words in Table 1.

Using this second criteria allowed degrees of correctness to be recognized. That is, using this scale allowed analysis of more (or less) effective strategies in attempting to spell an unknown word. A total of 73 feature points indicated all features in all the words were correct. This scoring also accounted for students who missed the same words, but used different strategies in their attempts. Thus, with a word such as *irreplaceable*, scores could range from zero to four, which would demonstrate student knowledge of each feature. The individual word scores provided a more accurate picture of the students’ strategies.

Survey responses were searched for categories of similarity and each question was read and coded. For example, question one asked if the respondent thought he or she was a good speller. While the responses were either No or Yes, each one had a qualifying comment following the level of agreement. So, “no, I have always struggled” was given a one and “yes, I’ve always done well in spelling” was given a five. Remaining comments were then placed along a continuum of agreement and scored from one to five. This approach for categorizing each set of answers was completed for all eight questions.

Results

Overall performance on inventory

The students’ inventory and feature analysis scores are displayed in Table 3. Inventory scores ranged from eight to 18 correct (of a possible 25), with a mean score of 14.5 correct. Percent correct ranged from 32% to 72%, with 58% as the mean. No students scored at the independent level (80% or above). The majority of the students (71%) scored within the instructional level (50 – 80%). More than one-quarter (29%) of the students scored within the frustration level (below 50%). The features scores ranged from 43 to 65 (of 73 possible points), with a mean score of 58 points. Percent correct ranged from 59% to 89%, with 79% as the mean. Figure 1 displays the percent correct on the inventory compared to the percent correct of features.

Table 3. Performance on 25 word spelling inventory

Student ID#	Raw inventory score (Of 25)	Percent correct		Raw feature score (Of 73)	Percent correct
1	8	32	Frustration	43	59
2	10	40		53	73
3	10	40		52	71
4	12	48		54	74
5	12	48		52	71
6	13	52	Instructional	57	78
7	14	56		54	74
8	15	60		55	75
9	15	60		61	84
10	15	60		60	82
11	17	68		62	85
12	17	68		62	85
13	17	68		61	84
14	18	72		62	85
15	18	72		64	88
16	18	72		64	88
17	18	72		65	89
Mean	14.5	58		58	79

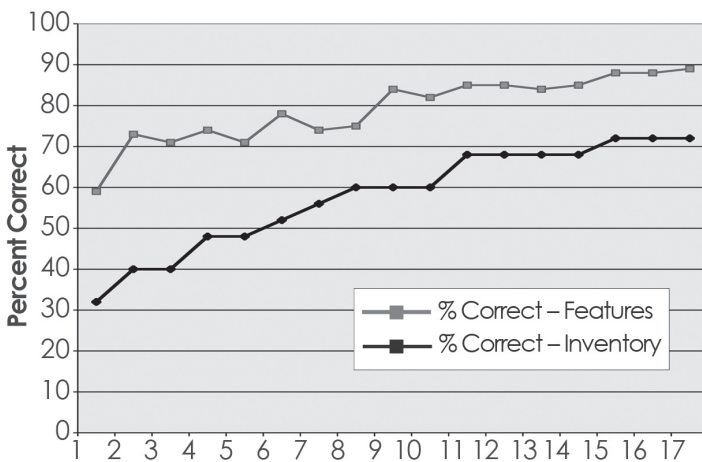


Figure 1. Comparison percent correct for inventory and features

In analyzing the scored attempts, students scoring within the frustration range appeared to use only sounding out as a strategy, whereas students at the upper end of instructional level used sounding and some morphological information in their attempts. For example, students in the frustration range wrote *irascible* as *iresable*, *eraassable*, and *uraziabile*. Examples of student attempts in the instructional range were *irrasible* and *irrasible*. None of the frustration level students used the *-ible* ending, and appeared to be most influenced by trying to represent exact letter/sound relationships. The majority of the instructional level students used *-ible*, appearing to understand how to add this ending to a word stem or root.

Designation was the only word all 17 students spelled correctly. This word has a high letter/sound relationship match. Other words that were correctly spelled by 90% or more of the students were:

- *earring* (94%), with only one student spelling it *earing*,
- *bombard* (94%), with one student spelling it *bombared*,
- *metacognition* (94%), spelled once as *medacognition*, and
- *their* (94%), with one incorrect spelling of *there*

Patterns of common errors were *condem* for *condemn* (thus missing the silent consonant pattern), and *creadance*, *creedance*, *credance* for *credence* (all using the *-ance* ending instead of *-ence*). Various errors were made with *premonition* with all students correctly writing the first target pattern, the prefix *pre-* and most students having the last target pattern, *-tion*, correct. Two students chose *-sion*, and one each wrote “*-science*”, “*-shen*”, and “*-cion*.” However, the middle two syllables caused considerable difficulties. The most common error was to choose “*-min*” as the middle syllable that contained the schwa sound (the vowel in the unstressed syllable). Students in the frustration level wrote *premanision*, *premenition*, *prene-science*, *preminicion*, and *premanition*. Students in the instructional range wrote *preminition* (most common choice), *premenision*, *premenishen*, *premenition*, and *premissision*. While the schwa sound is difficult to predict, proofreading the errors apparently did not help the students self-correct more obvious errors (i.e. the /*shðn*/ sound at the end of words is not spelled “*shen*”). While this word may be one the students have heard, their exposure to it in print may be minimal.

A word with multiple challenges for the students was *illegible*. Attempts included *elledgeable*, *illegeble*, *illegable*, *eledgable*, *illedgeable* and *eligible*. Many of these attempts, used by more than one student, ignored one or more of three patterns contained in the word: assimilated prefix, root word (*leg-*; from Latin *legere* “to read”), and suffix (*-ible*). Students in the frustration range were more likely to begin the word with *el-*, thus demonstrating an insecure knowledge of variations of the assimilated *in-* prefix and a reliance on their ear to provide information. The use

of *-ledge* for the middle sound showed an unawareness of this word's relationship to *legible*, a word they may see quite often in writing course rubrics.

Another challenging word was *commiserate* as only four of the 17 students spelled it correctly. The most common error was to spell the word with only one */m/*. This error showed an understanding of the surface structure of the prefix, but not the deep structure knowledge of the prefix and base word. The prefix *com-*, attached to a form of *misery* would require both */m/s*. Ear dominance was also evident with the higher scoring students (64%, 68%, and 68% correct) when a "z" was used to represent the */s/*. Students at the frustration level had attempts such as *commesurate*, and *commissorate*, again showing unawareness of the relationship to a similarly spelled base word.

The relationship between a student's raw inventory score and raw feature score was tested for significance. Using Pearson *r*, a significant relationship (+.94) was found ($p < .005$). Not surprisingly, the students who correctly spelled more words attained higher feature scores. The students at the higher end of the instructional range also scored more feature points for words missed than students in the lower levels. That is, two students might have both missed *efficacy* (worth "4" feature points), but lower level student scored one point for spelling it *ephacacey* and the higher level student scored three points for writing *effacacy*. Such differences in the students' attempts were observed in many of the three and four point words.

Responses on the Survey

All students scoring in the instructional range believed they were fairly good spellers. Of the five students in the frustration range, only one commented on struggling consistently with spelling, and the others rated themselves as average spellers. When asked how they learned to spell, 59% noted through sounding out words and 29% by memorizing for spelling tests. The student who scored the highest, noted that reading helped her learn to spell.

When asked what advice they were given when they needed help with spelling, 65% responded they were told to sound it out and 47% said they were sent to a dictionary (two students suggested both). But Respondent S12 did not believe the advice to use a dictionary was helpful. She stated:

My teachers always told us to get a dictionary and look it up. We always asked them "if we don't know how to spell it, how are we going to find it?" Their plan worked for words that weren't too tricky (the ones that didn't have too many silent letters). I don't use the advice any more, because if I spell something wrong the computer usually catches it.

In responding to the second part of Question Three, which asked if they still use the advice they were given when young, the majority of the students said they used what they were taught. Sounding out was still used by 65%, dictionaries were still used by 18%, but 18% said they no longer use the advice they were given and instead rely on Spell Check. As Respondent S5 explained regarding what advice she was given and what she still does, "Sound it out! This does not always work. I do use this advice but it does not help that much, I do it because it's the only way I learned." Many talked about the problems sounding out presents:

- Sometimes it is useful, but the english [sic] language it [sic] sometimes more complex than just "sounding it out" (S3);
- ...but now I am aware of more tricky letter combinations (S10);
- It does work but not it [sic] all cases.

When asked what they do when they are writing and cannot spell a word, 65% noted they would use the Spell Check feature on a computer. Respondent S7 seemed frustrated by this approach as when she "sound[s] out the word or if a computer is near I use it. I use Dictionary.com or Spellcheck. It is a shame that I need a machine to help me spell, but how else can I learn to spell? Isn't it a little late?" Other approaches used by the students were looking in a dictionary (41%), write the word then look at it for correctness (24%), and sound it out (12%). Sounding out, the method they most often learned and had been given as help when they were young, was the one they claimed to employ the least. There seemed to be a discrepancy between Question three (65% sound it out) and Question four (65% use Spell Check), which may well be due to the amount of writing done on the computer for college work. In order for students to allow the Spell Check to "help" them, they must sound out the word and then compare alternative spellings to correct their attempt. Therefore, sounding out appeared, in actuality, to be the most relied upon strategy.

All but one student could name someone who was a good speller. These varied from grandparent and parent (35%), friend or spouse (24%), to teachers (18%). The respondents believed these people were good spellers because they were smart or had a good "sense" about words (71%) or that they read and write a lot (29%).

When asked how they might help someone who was having trouble spelling a word, 59% responded they would tell the person to "sound it out." Many of the respondents had similar answers as S1, who stated, "tell them to listen to the sounds the letters make when you say them. Also breaking the letters down into syllables, which make the word easier to spell." Telling the speller to go to the dictionary was chosen by 35% of the respondents and 12% would just tell them

how to spell the word. One respondent would tell the troubled speller to get to know and understand prefixes and word histories (this person scored 60% on the spelling inventory). Another respondent who scored 72%, wrote she would tell the person to read more and do “fun things” with words such as crosswords. Only one respondent was unsure how she would help a troubled speller.

The last question on the survey asked the respondents what they would like to do better as a speller. Each respondent had very specific ideas about what he or she wanted to improve. These responses included improve their vocabulary (29%), memorize the spellings of more words (29%), more accurately recognize sounds and the rules that govern words (18%), be less dependent on Spell Check (12%), and be more consistent (12%). Respondent S4 described what she would like to do better as, “words that I constantly mis-spell [sic] I would like to memorize, so I don’t have that problem because if I’m leaving a quick note and am not using the computer, Its [sic] ??embarrassing [sic] to mis-spell [sic] words.”

The survey responses gave a glimpse into the students’ perception of themselves as spellers. Two strategies were most often noted: sounding out and using a dictionary. Students also noted the problems with these two strategies as sounding out only works if the letter/sound relationship is unquestionable. That is, words with silent letters, or “tricky” combinations cause problems when the student relies on sound. Dictionaries are a problem if you do not already know the word well enough to locate it. An incorrect guess at the beginning sound makes it nearly impossible for finding the word in the dictionary. For example, misspelling for words such as *irascible*, *illicit*, *illegible*, and *epiphanies* would have presented such a challenge for nine of the seventeen students. Only one student seemed to have an idea of how to help someone else beyond “sound it out.” This student suggested knowing word parts, such as prefixes and suffixes might help. Ultimately, the results suggest these students have limited strategies to help them spell challenging words.

Alignment of Performance and Perception of Self

Across the survey, students generally stated that they sounded out words when spelling. Their performance on the inventory showed that students did sound out to spell words with which they were unfamiliar. Some students had better attempts than others as sounding out *illegible* and then writing *elledgeable* versus *illegable* shows considerable differences in what each student might know about prefixes, bases, and suffixes. Choosing to spell *irascible* as *uraziabile* and *epiphanies* as *appifineise* demonstrates the dominance of ear over eye. A few judgments can be made about these two students’ inability to proofread and recognize that their

attempt does not look like any word they have seen in print. We can also be assured that they were, in fact, using a sounding out strategy to help write the words.

Question four would suggest that, although the students chose Spell Check as their main strategy, they must sound out the word in some way to allow the computer to search for a suitable match. Unfortunately, like the dictionary, writers must get “close enough” to have Spell Check help. To observe this, several of the students' attempted spellings were put into Microsoft Word© to check for suggested corrections. After entering *irascible* as *uraziabie* the Spell Check offered *erasable*, *unreliable*, *reliable*, *eradicable*, *trainable*, *risible*, *resizable*, and *graspable*. All a far cry from the intended word. Spell Check suggested that *elledgeable* (*illegible*) could be corrected as *allegeable* or *enlargeable*. *Epahcacey* (*efficacy*) produced the message, “no spelling suggestions.” With each of the sounding out approaches, problems persist for the students. Therefore, this study suggests students need more than just “sounding out” in their repertoire of strategies for spelling.

Discussion and Implications

To review, this study was designed to, in particular, inform the instructor of an undergraduate writing course and a professor of graduate level methods courses regarding strategies pre-service education students' use when spelling. Words chosen for the inventory frequently appear in their education courses or other university course work. “Sound it out” was the single most utilized strategy students used to approximate the spelling of a word. Only one student thought about teaching prefixes or word histories to a troubled speller, another suggested playing word games and no other strategies were suggested.

Research Questions Answered

Three questions guided the study. First, we asked *How well do adult students perform on an inventory of age-appropriate spelling patterns?* and administered a spelling inventory. No participants were working at an independent level. Nearly three-quarters of the students (71%) were operating at an instructional level and the remaining students (29%) scored within the frustration range. While the words were drawn from current university work, how often the students have seen the word in print is unknown. Would they recognize the word in print, but not be able to recall it for writing? This question could be further explored by first giving the students a vocabulary test whereby the word is pronounced and used in a sentence to establish context. The students could then be asked to write a definition of the word which would provide a measure of listening vocabulary. Students might further be asked

to identify how they know the word (I have seen it in print, I have heard it in a lecture/discussion, I have heard it but cannot define it, I do not know the word). Several of the students commented on the survey about their desire to expand and improve their vocabulary. This, too, needs further exploration: Do they mean reading, writing, or listening vocabulary?

Second, we asked, *What are adult students' perceptions of themselves as spellers?* This question was addressed through a short survey where all students were reserved in their self-assessment. Most of them believed they were "average" or "pretty good" spellers. One student in the frustration range noted that she struggled with spelling. The participants' comments suggested that few felt confident in their spelling skills. Smith (2004) suggests that "spelling is conspicuous, and probably the only aspect of writing that most people feel competent to pass judgment on, so errors are treated almost as antisocial behavior" (p. 288). While there are 26 letters in the English alphabet, those letters combine to make from 40 to 44 different sounds (Fox, 2000; Henry, 2003; Savage, 2001). When strictly spelling by "ear," inaccurate guesses can occur, and as student S4 put it "Its [sic] ??embarrassing [sic] to mis-spell [sic] words".

Finally, we compared the inventory and survey results when we asked, *What strategies do adult students claim to use when spelling unknown words and are these demonstrated in their inventory performance?* Sounding out remained the most frequently used and discussed strategy. The students suggested Spell Check was their current way to correctly spell and, for many of the students, sounding out a word could produce a corrected match by Spell Check. For some of the students, however, Spell Check would not have helped them. Their "sounding out" strategy so closely linked letters and sound that they completely ignored any meaning based information that might produce a near correct spelling. Hughes and Searle (1997) claim that students who hang "onto sound as the overriding logic for their spelling cut themselves off from other knowledge that would help them to develop" (p. 30). Montgomery, Karlan, and Coutinho (2001) examined the dependence on phonetics to sound out a word and the usefulness of Spell Check. They found that "the spell check functions of word processors...were only able to identify the target word for 53% of misspellings" (p. 37). And, as Respondent S4 recognized, she will not always be working on a computer. She understood that as a teacher, she may need to handwrite a quick note and she was worried about misspelling a word.

This study suggests instruction that develops knowledge about the meaning-spelling connection of English words might be beneficial for developing strategies beyond "sound it out." As Smith (2006) reminds us "another reason why spelling is not a direct reflection of the sounds of words is more fundamental. It is not basically the function of spelling to represent sound, but to represent meaning"

(p. 36). Providing students with experiences in structural and meaning analysis could expand their repertoire of strategies (Henry, 2003; Massengill, 2006; Moats, 2005/2006; Templeton, 1983). This group of pre-service education students evidently needs to examine their understandings of the structure of the English language. In spelling unfamiliar words and in projecting how they would help a struggling speller they generally relied on the only strategy they knew, sounding it out. Many thought memorizing more words would make them better spellers and essentially, these students would teach others spelling they way they were taught. Changing understandings about how one learns to become an efficient speller and how a teacher approaches such instruction comes with preparation and a philosophical shift (Fresch, 2003).

Future directions of this study will provide students with opportunities to move beyond their reliance on the alphabetic nature of English and begin to construct knowledge about other layers of the language. An examination of the “pattern layer of information” (Bear, et al., 2004, p. 6) would extend the students’ current use of sound patterns to larger groupings of letters. For instance, the students who used “*shen*” to represent the /*shðn*/ sound might investigate and sort words with *-tion*, *-sion*, and *-cian*. Beyond developing knowledge about these three patterns, students might also come to understand the ending is never spelled “*shen*.” Students might then move on to the “meaning layer of information” (Bear, et al., 2004, p. 6). An example of this layer is the errors made when spelling *conspiracy*. Examining words with vowel or consonant alternations demonstrate that sounds may shift, but meaning-related words maintain similarities in spelling. So, investigating words related in meaning to *conspire* could help students who spelled the middle syllable of *conspiracy* as “*sper*.” Developing the strategy to think of related words allows students to mediate their attempts beyond sounding out. While their spelling may not be completely correct, they may at least “invent” with thought. That is, to move beyond the sounding out strategy, students must think about what they know about the English language. They may then develop a spelling comprehension, or an understanding of the meaning of words beyond the alphabetic level.

This study has stimulated ideas for continued work and several follow-up studies have been suggested. What becomes apparent is students need multiple strategies for spelling. If they rely on Spell Check, then how might they make the best use of it? Would use of strategic attempts affect expansion of their spelling and vocabulary knowledge? Does having the ability to tap into such strategies add to their confidence level as spellers? Such questions continue to inform this line of inquiry.



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